



INTERNAL AUDIT DIVISION

REPORT 2014/014

Audit of the implementation of the Murex system in the Investment Management Division of the United Nations Joint Staff Pension Fund

Overall results relating to the effective implementation of the Murex system were initially assessed as unsatisfactory. Implementation of three critical and six important recommendations remains in progress.

FINAL OVERALL RATING: UNSATISFACTORY

26 March 2014

Assignment No. AT2013/801/01

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AUDIT REPORT

Audit of the implementation of the Murex system in the Investment Management Division of the United Nations Joint Staff Pension Fund

I. BACKGROUND

1. The Office of Internal Oversight Services (OIOS) conducted an audit of the implementation of the Murex system in the Investment Management Division (IMD) of the United Nations Joint Staff Pension Fund (UNJSPF or the Fund).
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. Murex is a portfolio accounting and reconciliation system for the settlement and processing of securities transactions in support of back office operations.
4. The stated objective of implementing Murex was to install a straight-through-processing (STP) system from front-to-back of all traded assets, including the support of back-office operations. Murex included functionalities for portfolio accounting and reconciliation and was intended to support:
 - (i) Multiple global asset classes including: Fixed income, equities, real estate, short-term instruments and cash, alternative investments (i.e., Fund of funds, private equities, commodities, etc.), and foreign exchange transactions; and
 - (ii) The automation of multiple operations and functions for recordkeeping, settlement of investment transactions, foreign exchange, cash management, reconciliation of positions and transactions, and regulatory compliance.
5. The scope of the Murex system included:
 - (i) Core processes for managing static data including currencies, securities, indices, calendars, settlement instructions, counterparties (brokers and banks), user security, groups, organization definitions, transactions workflows, daily processing batches, security, audit trails, basic reports, deal capture, confirmations, and deal processing;
 - (ii) Finance processes for the implementation of accounting procedures based on the International Public Sector Accounting Standards (IPSAS), transaction settlements, cash management (i.e., Nostro accounts), and corporate actions; and
 - (iii) Integration mechanisms using a standard interface with the Charles River trade order management system, Risk Metrics, and the Society for Worldwide Interbank Financial Telecommunication (SWIFT).
6. The Murex project was managed by the Director of IMD, acting as the project executive, and a project board which was responsible for providing guidance and oversight.

7. The scope of the project did not include the execution of trades (which was performed using the Charles River trade order management system), pre-trade pricing/structuring, scenario analysis, market and credit risk limits, value at risk, and market stress testing.
8. The resources required for the implementation of the Murex system, as submitted to the Pension Fund Board, included an appropriation of \$ 2,790,000 for 2010-2011, and \$1,100,000 for 2012-2013.
9. Comments provided by IMD are incorporated in italics.

II. OBJECTIVE AND SCOPE

10. The audit of was conducted to assess the adequacy and effectiveness of IMD governance, risk management and control processes in providing reasonable assurance regarding the **effective implementation of the Murex system**.

11. This audit was included in the 2013 OIOS risk-based audit plan due to the operational and financial risks associated with the acquisition and implementation of the Murex system whose purpose is to support the accounting and reconciliation of the settlement and processing of securities transactions.

12. The key controls tested for the audit were: (a) project management capacity; and (b) information and communications technology (ICT) support system. For the purpose of this audit, OIOS defined these key controls as follows:

(a) **Project management capacity** - controls that provide reasonable assurance that there is sufficient project management capacity to achieve the strategic goals defined for the implementation of the Murex system, including: (i) adequate financial resources; (ii) adequate and competent human resources; and (iii) appropriate project management tools, methodology and systems; and

(b) **ICT support system** - controls that provide reasonable assurance that the Murex system will adequately support straight-through- processing of all traded assets, including the back office operations of IMD.

13. The key controls were assessed for the control objectives shown in Table 1. Certain control objectives (shown in Table 1 as “Not assessed”) were not relevant to the scope defined for this audit.

14. OIOS conducted this audit from 9 April to 8 November 2013. The audit covered the period from 2009 to 2013.

15. 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

16. IMD governance, risk management and control processes examined were **unsatisfactory** in providing reasonable assurance regarding **the effective implementation of the Murex system**. OIOS made 9 recommendations to address the issues identified in the audit. Whilst IMD had prepared a project initiation document, established a project board and sought budget appropriations for the project, there

were control weaknesses identified in the implementation of the Murex system, including: (i) incomplete business case, project plans, and cost-benefit analysis; (ii) inadequate project governance; (iii) unclear project phases; (iv) lack of budget monitoring procedures; (v) inadequate monitoring procedures and undefined performance measurements; (vi) weak procurement and contract management; (vii) inadequate hiring and performance evaluation procedures for consultants; (viii) inadequate change management procedures; (ix) inadequate involvement of end users; and (x) undefined support requirements.

17. The initial overall rating was based on the assessment of key controls presented in Table 1 below. The final overall rating is **unsatisfactory** as implementation of three critical and six important recommendations remains in progress.

Table 1: Assessment of key controls

Business objective	Key controls	Control objectives			
		Efficient and effective operations	Accurate financial and operational reporting	Safeguarding of assets	Compliance with mandates, regulations and rules
Effective implementation of the Murex system	(a) Project management capacity	Unsatisfactory	Unsatisfactory	Unsatisfactory	Unsatisfactory
	(b) ICT support system	Partially satisfactory	Unsatisfactory	Not assessed	Not assessed
FINAL OVERALL RATING: UNSATISFACTORY					

A. Project management capacity

Incomplete project details and documentation

18. In accordance with the best practices (Projects In Controlled Environments, PRINCE II) adopted by IMD for managing projects, the implementation of Murex should have been planned with particular attention to planning, governing, monitoring, and controlling the various stages of the activities required. At the outset of the project, there should have been a clear definition of roles and responsibilities, phases, milestones, progress control criteria and mechanisms, expected benefits, and decision points.

19. The Information Systems Section (ISS) of IMD prepared a high-level project initiation document (PID), composed of key documents outlining the project scope, organization, business case, risks, and constraints. However, while the PID envisioned the implementation of processes related to project governance, configuration of the system, monitoring, change control, quality and risk management strategies, these key control processes were not established.

20. Although the PID included qualitative benefits, there was no quantitative data to support and measure the realization of the expected benefits. In particular, the PID prepared by ISS did not include:

- (i) Roles, responsibilities, and terms of reference of the governing bodies for tracking and controlling project activities and costs;
- (ii) Adequately segregated duties between the project manager and service supplier;

- (iii) Requirements and expected deliverables;
- (iv) Risk management plan;
- (v) Change and quality control mechanisms;
- (vi) Budget and human resources requirements;
- (vii) Business readiness plan, with project phases, and work and resources needs; and
- (viii) Benefit realization plan to monitor the progress made in the implementation of Murex and measure its outcome.

(1) IMD should ensure that the fundamental elements of the Murex project are confirmed and documented, with particular regard to:

- (i) roles, responsibilities, and updated terms of reference of the governing bodies of the project (i.e., project executive, steering committee, and project manager);**
- (ii) governance mechanisms;**
- (iii) requirements and expected deliverables of the Murex system;**
- (iv) risk management plan;**
- (v) change and quality controls; and**
- (vi) benefit realization plan with complete information on the expected benefits and costs, and the criteria for their evaluation.**

IMD accepted recommendation 1 and stated that at this stage the Murex project is suspended pending the completion and results of the request for proposal (RFP) on “IMD Information Architecture and IT (information technology) Infrastructure Assessment” study and the corresponding RFP for the recommended solutions. It is expected that the RFP on the assessment will be completed in the third quarter of 2014 and the RFP on the recommended solution will be completed towards the end of 2015. Recommendation 1 remains open pending the results of the study on IMD information architecture and IT infrastructure assessment.

Significant delays in the implementation of Murex

21. Changes to the scope of implementation of Murex should have been timely documented and justified, with corresponding updates on resources, timeline, expected impact, benefits, and costs, submitted for review and approval to the Project Board.

22. The scope of the Murex project, and the specifications outlined in the contract originally signed with an external consulting firm engaged for the implementation of the system, included the delivery of processes and finance functionalities that should have supported the implementation of IPSAS, transaction settlements, cash management (i.e., Nostro accounts), and corporate actions.

23. IMD documented a project plan that included a list of tasks and work packages. However, the plan did not include sufficient details about the implementation schedule, project phases, and work and resource requirements.

24. The project experienced significant delays in the implementation due to problems related to the management of the external consulting firm and individual consultants. IMD decided not to extend the contract with the external consulting firm in 2012, and expanded the original contract signed with the software vendor to include additional consulting services and changes that led to a recalibration of the project plan by removing accounting, Nostro accounts, and cash management from the scope of the Murex project. One of the most critical changes made in the implementation of Murex system was the decision to recalibrate the scope of the project and defer two critical components of the initiative: (i) accounting; and (ii) Nostro accounts (for cash and security).

25. IMD stated that the recalibration of the scope of implementation of the Murex project pertained only to the first phase of the project. As a result, the functionalities removed from the first phase would have been postponed to a second phase of the project. However, the project documentation did not show any instance of review and/or approval by the project board of the changes made in the scope of implementation of the Murex system.

26. The partial implementation of Murex exposed IMD to increased risks stemming from the use of an incomplete Murex system that allowed the processing of a larger volume of trades without the corresponding support components for accounting and reconciliation to: (i) track and maintain proper investment records; (ii) ensure timely reporting; and (iii) perform daily matching of investment data (holdings, transactions, and investment accounting) with the master record keeper and the custodians; and (iv) identify and analyze exceptions. Therefore, IMD operated a partially automated trade processing system with manual reconciliations, reports, and analysis of exceptions. This condition limited the ability of IMD to identify and address exceptions in the early stages of the trade processing life cycle, increasing its exposure to operational risks.

27. Although the project team utilized the Microsoft Project application for tracking and documenting the execution of the task plan, target dates and deliverables for the milestones were not established and tracked.

28. The supplementary information to budget estimates presented to the United Nations Joint Staff Pension (UNJSP) Board in April 2011 indicated that the Murex project was expected to be completed by 31 December 2011. However, significant delays were experienced in the implementation of the project, which were not adequately accounted for and communicated to stakeholders.

(2) IMD should: (i) design and implement planning and control mechanisms including detailed reports to monitor the implementation of the Murex project against timelines, with process and resource dependencies; and (ii) design and implement adequate compensating controls to operate the partially automated trade processing system with manual reconciliations, reports, and analysis of exceptions.

IMD accepted recommendation 2 and stated that at this stage the Murex project is suspended pending the completion and results of the RFP on “IMD Information Architecture and IT Infrastructure Assessment”. It is expected that the RFP will be completed in the third quarter of 2014. Recommendation 2 remains open pending the results of the study on IMD information architecture and IT infrastructure assessment.

Inadequate monitoring procedures and undefined performance measurements

29. Indicators, metrics, and mechanisms should have been defined for monitoring and reporting on the performance of the Murex implementation. The definition of indicators and metrics should have been reviewed and approved by the relevant governing bodies at the beginning and end of each reporting period.

30. There were no performance indicators defined and approved by the project board to be used for monitoring the status of the project and measuring its progress. The absence of this critical control prevented IMD from a correct management of the vendors that led to implementation delays and budget overruns.

31. Although some implementation issues were logged during the execution of work packages, they had not been reported for review to senior management. These issues included significant shortcomings with the performance of the external consulting firm and the individual consultants that, ultimately, were considered the main cause of delays, contractual realignments, and reworks.

32. Two documents, titled “Murex Implementation Highlight Status Report”, were issued in July 2011 and October 2012 respectively, as status updates of the project. However, these reports were not issued on a consistent basis. The July report was issued for the period of 13 June to 15 July 2011, and the October report was issued for the period January to October 2012. These reports were only distributed to the Project Manager and Project Team but not to the members of the Project Board.

33. Furthermore, there were inconsistencies within the above reports. The reports indicated that the project was running within the original tolerances set by the project board, when in fact no tolerances had been set and, as reported in October 2012, the project was already behind schedule.

(3) IMD should: (i) define performance indicators for determining the progress of the Murex project and use them to measure its success; and (ii) develop related escalation procedures for approval by the Steering Committee.

IMD accepted recommendation 3 and stated that at this stage the Murex project is suspended pending the completion and results of the RFP on “IMD Information Architecture and IT Infrastructure Assessment”. It is expected that the RFP will be completed in the third quarter of 2014. Recommendation 3 remains open pending the results of the study on IMD information architecture and IT infrastructure assessment.

Weak procurement and contract management

34. The Murex contract should have been managed in accordance with the provisions established in the Procurement Manual.

35. IMD engaged an external consulting firm for integrating and configuring the Murex system in its existing environment. The contract with the external consulting firm was on a fixed time and material basis. However, the performance of the external consulting firm was not measured against documented performance and delivery criteria. Furthermore, while the firm changed the expected deliverables of its activities, these changes were not documented and tracked.

36. Several issues were noted in the procurement and contract management of the external consulting firm engaged by IMD for the implementation of the Murex system, including:

- (i) Noncompliance with the provisions of the Procurement Manual related to the composition of the evaluation committee;
- (ii) Inadequate rationale presented for requesting the increase of the not-to-exceed-amount (NTE) limit of the contract with the external consulting firm;
- (iii) Contradictory statements about the performance of the external consulting firm;
- (iv) Noncompliance with the provisions of the Procurement Manual related to amendment of contract provisions. Although, in January 2012, IMD requested PD to expand the contractual arrangements with the software vendor, no amendment was made to the original contract. IMD proceeded in requesting services from the software vendor using a general consultancy clause included in the original contract as a basis for issuing purchase orders for integration and implementation services. In OIOS' opinion, this approach circumvented the provisions of the Procurement Manual related to amendments to contract provisions because the new services requested from the software vendor should have been subject of an amendment to the original contract or a new competitive bidding process. This issue was particularly relevant in light of the concerns already expressed by the Headquarters Committee on Contracts with regard to the original contract awarded to the software vendor for the provision of the software system, highlighting a procedural flaw in the bidding process;
- (v) Ex-post facto extension of the contract to cover additional hours of service provided by the software vendor; and
- (vi) Services expected from the external vendor were not delivered in their entirety. The initial NTE established for the contract signed on June 2011 with the external consulting firm was in the amount \$205,725. In October 2011, IMD requested an increase of the NTE to \$449,780. However, between 2011 and 2012, the external consulting firm was paid a total of \$482,452, i.e., an additional amount of \$32,672. Although the external consulting firm was paid in full, it was determined that the services expected were not delivered in their entirety.

(4) IMD should, in coordination with the Procurement Division, review the control weaknesses in the management of the contracts established with the software vendor and the external consulting firm, and identify a suitable course of action for ensuring that the services required for completing the implementation of the Murex system are acquired in full compliance with the Procurement Manual.

IMD accepted recommendation 4 and stated that at this stage the Murex project is suspended pending the completion and results of the RFP on "IMD Information Architecture and IT Infrastructure Assessment". It is expected that the RFP will be completed in the third quarter of 2014. Recommendation 4 remains open pending the results of the study on IMD information architecture and IT infrastructure assessment.

Lack of budget monitoring controls

37. The costs associated with the implementation of the Murex system should have been monitored with adequate costing and budgeting controls.

38. The supplementary information on budget estimates presented by IMD to the UNJSP Board in April 2011 for the acquisition and implementation of the Murex system indicated that the estimate was \$2,790,000 for 2010-2011. Also presented for the biennium 2012-2013 was an appropriation of

\$1,100,000 for 2 years' license fees. The total appropriation for both biennia was \$3,890,000. The 2012-2013 budget estimates indicated that the project will be completed by December 2014. However, there was no budget appropriation to cover implementation costs for both biennia.

39. The Project Team had prepared expenditure reports for the Director of IMD, related to the years ending 2011 and 2012. However, these reports did not provide information covering all the costs of the project, and no information was provided for expenditures incurred in 2013. The project team did not implement adequate budget monitoring controls because there was no alignment between the project plan and the budget. In particular, the appropriated amount of \$3,890,000 was most likely exceeded because the following costs were not accounted and reported at the time of the audit:

(i) The cost of Murex license fees for 2013 (approximately \$576,000); and

(ii) Other implementation costs incurred in 2013 for the additional services requested from the software vendor and other consultants.

40. The expenditure for the Murex project as at 31 December 2012 was \$3,286,096, and the amount appropriated for the Murex project was \$3,890,000 for the biennia 2010-2011 and 2012-2013 (Murex system expense report 19 August and 09 October 2013). IMD did not document and report the total cost of the Murex system implementation in a clear manner. Project costs and budget appropriations were not consistently reported. For example, expenditure reports provided to OIOS by IMD demonstrated that in 2011 the project expenditures included costs related to internal resources, license, infrastructure, and implementation. However, the same reports for 2012 presented two versions (Appendix II): (i) one version included costs associated with internal resources in the amount of \$634,816; and (ii) a second version, instead, included only the costs of consulting services in the amount of \$960,065. These inconsistencies further confirmed the absence of adequate monitoring of the budget appropriations and project expenditures and reporting.

(5) IMD should: (i) implement adequate mechanisms for monitoring the budget appropriations and expenditures of the Murex project in a consistent, detailed, and timely manner; and (ii) submit exception reports to the Steering Committee to ensure that expenditures are within budgetary allocations, and that any deviation is identified and reported in a timely manner.

IMD accepted recommendation 5 and stated that at this stage the Murex project is suspended pending the completion and results of the RFP on "IMD Information Architecture and IT Infrastructure Assessment". It is expected that the RFP will be completed in the third quarter of 2014. Recommendation 5 remains open pending the results of the study on IMD information architecture and IT infrastructure assessment.

Inadequate hiring and performance evaluation procedures for consultants

41. External consultants should have been engaged on the basis of clear and detailed terms of reference. Their performance should have been managed and measured on the basis of pre-defined criteria, and mechanisms for tracking, verifying and documenting their deliverables.

42. IMD hired two consultants at different periods of the Murex project to perform similar assignments. The terms of reference used to recruit the consultants were generic in nature and did not detail the specific tasks required. In addition, the lack of clear criteria to measure and monitor their performance prevented IMD from providing adequate evidence in support of their unsatisfactory assessment.

43. The inadequate management of the individual consultants resulted in rework and additional expenditures. In one case, a consultant was terminated for poor performance but was still paid in full because her timesheets had not been maintained in a correct and consistent manner, and performance issues were not adequately logged. In another case, the performance of a consultant was rated unsatisfactory because he did not demonstrate adequate knowledge of the Murex system. However, six months earlier, in the previous assessment of his performance, the performance of the same consultant was rated satisfactorily for having good knowledge of the Murex system. In a memo to the Procurement Division, IMD stated that the unsatisfactory performance of the individual consultants was another reason for requesting the software vendor to provide the services required for advancing in the implementation of the system. This condition eventually caused delays, rework, and additional expenditure.

(6) IMD should ensure that the engagement of any additional external subject matter expert in support of the Murex project is based on: (i) clear performance criteria; and (ii) adequate mechanisms for tracking, verifying, and documenting their performance and deliverables.

IMD accepted recommendation 6 and stated that at this stage the Murex project is suspended pending the completion and results of the RFP on “IMD Information Architecture and IT Infrastructure Assessment”. It is expected that the RFP will be completed in the third quarter of 2014. Recommendation 6 remains open pending the results of the study on IMD information architecture and IT infrastructure assessment.

B. ICT support system

Inadequate involvement of end users

44. End users should have been directly involved in the implementation of the Murex system, with a clear definition of their specific role in relation to ISS staff. The role of end users was critical both in the definition of the functional requirements as well as the subsequent acceptance testing of the developed ICT system.

45. The involvement of end users in the implementation of Murex was limited to their participation in user acceptance tests and participation in discussions related to the second phase of the Murex project. In this regard, the following control weaknesses were noted:

(i) The roles and responsibilities of end users were not defined;

(ii) There was no evidence of end users participation in the definition of the functional requirements of the Murex system; and

(iii) The current and proposed workflows of Murex operations had been documented by ISS and were presented to the Operations Team at a very late stage of the project (during the user acceptance test for Phase 1, November 2012). Instead, end users representing the substantive area of IMD should have been involved in defining the functional requirements to design and configure the Murex system. This shortcoming was identified in the “highlight status” report of 19 October 2012, prepared by ISS, stating that a key risk of the Murex project was the limited involvement of end users in providing definite official requirements.

(7) IMD should develop and implement procedures to: (i) ensure adequate clarity of roles between ISS and end users in the design and testing phases of Murex; and (ii) ensure that end users are adequately represented in the project team.

IMD accepted recommendation 7 and stated that at this stage the Murex project is suspended pending the completion and results of the RFP on “IMD Information Architecture and IT Infrastructure Assessment”. It is expected that the RFP will be completed in the third quarter of 2014. Recommendation 7 remains open pending the results of the study on IMD information architecture and IT infrastructure assessment.

Undefined ICT support requirements

46. Given the anticipated significant increase in the processing of trade volumes (from 60 up to 1000 daily), and the related increase in the Murex exception reports of potential fail trades, IMD should have determined the level of resources required in ISS to maintain and support the expected new workload. However, such an assessment was not completed and, therefore, IMD was exposed to the risk of not having sufficient ICT support for the Murex system and the other applications already installed in the Division.

(8) IMD should conduct a needs assessment of the ICT resources required for supporting the Murex system.

IMD accepted recommendation 8 and stated that at this stage the Murex project is suspended pending the completion and results of the RFP on “IMD Information Architecture and IT Infrastructure Assessment”. It is expected that the RFP will be completed in the third quarter of 2014. Recommendation 8 remains open pending the results of the study on IMD information architecture and IT infrastructure assessment.

Duplicate trade orders

47. The implementation of the Murex system should have increased the security and reliability of the instructions transmitted to the custodians and master record keeper about transactions and settlement, resulting in a reduced risk of error and fraud.

48. During the period 23 to 25 September 2013, IMD experienced a series of issues including duplication of trades and a transaction bottleneck. The first problem resulted from the duplication of SWIFT messages sent to the master record keeper and the custodians, because of a human error made during a business continuity/disaster recovery testing exercise. While switching over to the disaster recovery site, the same SWIFT messages were processed from both the disaster recovery and the production site. The second problem, associated with a transaction bottleneck, resulted from a large block of trades sent from the Charles River trade order management system to the Murex system. The Murex system was unable to process the workload and stopped functioning. Although, the execution of the duplicate trades was stopped and no losses were incurred by the Fund, this incident was indicative of an inadequate volume testing of Murex to measure its ability to process large blocks of trades.

49. There were also delays in the identification of the causes that led to these incidents. In this regard, the following control weaknesses were noted:

(i) Delays in the implementation of the automated reconciliation functionality within the Murex system. This issue confirmed the risk exposure identified in the previous section above, related to

the risks associated with a partial implementation of Murex and the lack of change management procedures;

(ii) Inadequate controls within the SWIFT messaging system that did not detect the duplicate messages; and

(iii) Over-reliance on the master record keeper in detecting errors.

(9) IMD should: (i) plan and conduct volume and stress testing to measure the Murex system's ability to process large volume of transactions and its performance beyond normal levels of operation; and (ii) review the disaster recovery testing plans by including additional preventive controls for ensuring adequate communication and coordination with the master record keeper and custodians.

IMD accepted recommendation 9 and stated that at this stage the Murex project is suspended pending the completion and results of the RFP on "IMD Information Architecture and IT Infrastructure Assessment". It is expected that the RFP will be completed in the third quarter of 2014. Recommendation 9 remains open pending the results of the study on IMD information architecture and IT infrastructure assessment.

IV. ACKNOWLEDGEMENT

50. OIOS wishes to express its appreciation to the Management and staff of IMD 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 the implementation of the Murex system in the Investment Management Division of the United Nations Joint Staff Pension Fund

Rec. no.	Recommendation	Critical ¹ / Important ²	C/O ³	Actions needed to close recommendation	Implementation date ⁴
1	<p>IMD should ensure that the fundamental elements of the Murex project are confirmed and documented, with particular regard to:</p> <p>(i) roles, responsibilities, and updated terms of reference of the governing bodies of the project (i.e., project executive, steering committee, and project manager);</p> <p>(ii) governance mechanisms;</p> <p>(iii) requirements and expected deliverables of the Murex system;</p> <p>(iv) risk management plan;</p> <p>(v) change and quality controls; and</p> <p>(vi) benefit realization plan with complete information on the expected benefits and costs, and the criteria for their evaluation.</p>	Critical	O	Results of the study on “IMD Information Architecture and IT Infrastructure Assessment”.	Not provided
2	IMD should: (i) design and implement planning and control mechanisms including detailed reports to monitor the implementation of the Murex project against timelines, with	Critical	O	Results of the study on “IMD Information Architecture and IT Infrastructure Assessment”.	Not provided

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 IMD in response to recommendations.

STATUS OF AUDIT RECOMMENDATIONS

Audit of the implementation of the Murex system in the Investment Management Division of the United Nations Joint Staff Pension Fund

Rec. no.	Recommendation	Critical ¹ / Important ²	C/O ³	Actions needed to close recommendation	Implementation date ⁴
	process and resource dependencies; and (ii) design and implement adequate compensating controls to operate the partially automated trade processing system with manual reconciliations, reports, and analysis of exceptions.				
3	IMD should: (i) define performance indicators for determining the progress of the Murex project and measure its success; and (ii) develop escalation procedures for approval by the Steering Committee.	Important	O	Results of the study on “IMD Information Architecture and IT Infrastructure Assessment”.	Not provided
4	IMD should, in coordination with the Procurement Division, review the control weaknesses in the management of the contracts established with the software vendor and the external consulting firm, and identify a suitable course of action for ensuring that the services required for completing the implementation of the Murex system are acquired in full compliance with the Procurement Manual.	Important	O	Results of the study on “IMD Information Architecture and IT Infrastructure Assessment”.	Not provided
5	IMD should: (i) implement adequate mechanisms for monitoring the budget appropriations and expenditures of the Murex project in a consistent, detailed, and timely manner; and (ii) submit exception reports to the Steering Committee to ensure that expenditures are within budgetary allocations, and that any deviation is identified and reported in a timely manner.	Critical	O	Results of the study on “IMD Information Architecture and IT Infrastructure Assessment”.	Not provided
6	IMD should ensure that the engagement of any additional external subject matter expert in support of the Murex project is based on: (i)	Important	O	Results of the study on “IMD Information Architecture and IT Infrastructure Assessment”.	Not provided

STATUS OF AUDIT RECOMMENDATIONS

Audit of the implementation of the Murex system in the Investment Management Division of the United Nations Joint Staff Pension Fund

Rec. no.	Recommendation	Critical¹/ Important²	C/O³	Actions needed to close recommendation	Implementation date⁴
	clear performance criteria; and (ii) adequate mechanisms for tracking, verifying, and documenting their performance and deliverables.				
7	IMD should develop and implement procedures to: (i) ensure adequate clarity of roles between ISS and end users in the design and testing phases of Murex; and (ii) ensure that end users are adequately represented in the project team.	Important	O	Results of the study on “IMD Information Architecture and IT Infrastructure Assessment”.	Not provided
8	IMD should conduct a needs assessment of the ICT resources required for supporting the Murex system.	Important	O	Results of the study on “IMD Information Architecture and IT Infrastructure Assessment”.	Not provided
9	IMD should: (i) plan and conduct volume and stress testing to measure the Murex system’s ability to process large volume of transactions and its performance beyond normal levels of operation; and (ii) review the disaster recovery testing plans by including additional preventive controls for ensuring adequate communication and coordination with the master record keeper and custodians.	Important	O	Results of the study on “IMD Information Architecture and IT Infrastructure Assessment”.	Not provided

APPENDIX I

Management Response

United Nations  Nations Unies

INTEROFFICE MEMORANDUM

MEMORANDUM INTERIEUR

TO: Mr. Gurpur Kumar, Deputy Director
A: Internal Audit Division

DATE: 21 February 2014

REFERE

NCE:

FROM: Maria Eugenia Casar, Representative of the
DE: Secretary General for Investments of the
United Nations Joint Staff Pension Fund

[Handwritten Signature] - 20/03/2014

SUBJECT: Draft report on an audit of the implementation of the Murex system
OBJET: in the Investment Management Division of the United Nations Joint
Staff Pension Fund (assignment No. AT2013/801/01)

Reference is made to your memorandum dated providing the report on the above mention audit.

I am pleased to provide IMD's comments on the findings and recommendations as requested.

Please find attached the Annex to the audit recommendations which details IMD's responses to the findings.

In considering the findings IMD respectfully observes that the comments regarding budget estimates and expenditure reports (paras 44 - 46) may be imprecise vis-à-vis the actual outlay and allocation. This was referenced in a earlier 2013 memorandum to OIOS.

I wish to thank you and OIOS for the recommendations made following the review and for the positive interaction with IMD Staff regarding this matter.

cc: Suzanne Bishopric
Toru Shindo
Ajit Singh
Kamel Kessaci
Zelda Tangonan-Fourcade
Daniel Willey
Anna Halasan

MANAGEMENT RESPONSE

Audit of the implementation of the Murex system in the Investment Management Division of the United Nations Joint Staff Pension Fund

Rec. no.	Recommendation	Critical ¹ / Important ²	Accepted? (Yes/No)	Title of responsible individual	Implementation date	Client comments
1	<p>IMD should ensure that the fundamental elements of the Murex project are confirmed and documented, with particular regard to:</p> <p>(i) roles, responsibilities, and updated terms of reference of the governing bodies of the project (i.e., project executive, steering committee, and project manager);</p> <p>(ii) governance mechanisms;</p> <p>(iii) requirements and expected deliverables of the Murex system;</p> <p>(iv) risk management plan;</p> <p>(v) change and quality controls; and</p> <p>(vi) benefit realization plan with complete information on the expected benefits and costs, and the criteria for their evaluation.</p>	Critical	Yes, on ongoing and future projects	IMD Director	TBD	At this stage the Murex project is suspended pending the completion and results of the RFP on "IMD Information Architecture and IT Infrastructure Assessment" study and the corresponding RFPs for the recommended solutions. It is expected that the RFP on the assessment will be completed in the 3 rd quarter of 2014 and the RFPs on the recommended solutions will be completed towards the end of 2015.
2	IMD should: (i) design and implement planning and control mechanisms including detailed reports to monitor the implementation of the Murex project against timelines, with process and	Critical	Yes	IMD Director	TBD	At this stage the Murex project is frozen pending the completion and results of the RFP on "IMD IT Architecture

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 the implementation of the Murex system in the Investment Management Division of the United Nations Joint Staff Pension Fund

Rec. no.	Recommendation	Critical ¹ / Important ²	Accepted? (Yes/No)	Title of responsible individual	Implementation date	Client comments
	resource dependencies; and (ii) design and implement adequate compensating controls to operate the partially automated trade processing system with manual reconciliations, reports, and analysis of exceptions.					Assessment". It is expected that the RFP to be completed in the 3 rd quarter of 2014.
3	IMD should: (i) define performance indicators for determining the progress of the Murex project and measure its success; and (ii) develop escalation procedures for approval by the Steering Committee.	Important	Yes	IMD Director	TBD	At this stage the Murex project is frozen pending the completion and results of the RFP on "IMD IT Architecture Assessment". It is expected that the RFP to be completed in the 3 rd quarter of 2014.
4	IMD should, in coordination with the Procurement Division, review the control weaknesses in the management of the contracts established with the software vendor and the external consulting firm, and identify a suitable course of action for ensuring that the services required for completing the implementation of the Murex system are acquired in full compliance with the Procurement Manual.	Important	Yes	IMD Director	TBD	At this stage the Murex project is frozen pending the completion and results of the RFP on "IMD IT Architecture Assessment". It is expected that the RFP to be completed in the 3 rd quarter of 2014.
5	IMD should: (i) implement adequate mechanisms for monitoring the budget appropriations and expenditures of the Murex project in a consistent, detailed, and timely manner; and (ii) submit exception reports to the Steering Committee to ensure that expenditures are within budgetary allocations, and that any deviation is identified	Critical	Yes	IMD Director	TBD	At this stage the Murex project is frozen pending the completion and results of the RFP on "IMD IT Architecture Assessment". It is expected that the RFP to be completed in the 3 rd quarter of 2014.

MANAGEMENT RESPONSE

Audit of the implementation of the Murex system in the Investment Management Division of the United Nations Joint Staff Pension Fund

Rec. no.	Recommendation	Critical ¹ / Important ²	Accepted? (Yes/No)	Title of responsible individual	Implementation date	Client comments
	and reported in a timely manner.					
6	IMD should ensure that the engagement of any additional external subject matter expert in support of the Murex project is based on: (a) clear performance criteria; and (b) adequate mechanisms for tracking, verifying, and documenting their performance and deliverables.	Important	Yes	IMD Director	TBD	At this stage the Murex project is frozen pending the completion and results of the RFP on "IMD IT Architecture Assessment". It is expected that the RFP to be completed in the 3 rd quarter of 2014.
7	IMD should develop and implement procedures to: (i) ensure adequate clarity of roles between ISS and end users in the design and testing phases of Murex; and (ii) ensure that end users are adequately represented in the project team.	Important	Yes	IMD Director	TBD	At this stage the Murex project is frozen pending the completion and results of the RFP on "IMD IT Architecture Assessment". It is expected that the RFP to be completed in the 3 rd quarter of 2014.
8	IMD should conduct a needs assessment of the ICT resources required for supporting the Murex system.	Important	Yes	IMD Director	TBD	At this stage the Murex project is frozen pending the completion and results of the RFP on "IMD IT Architecture Assessment". It is expected that the RFP to be completed in the 3 rd quarter of 2014.
9	IMD should: (i) plan and conduct volume and stress testing to measure the Murex system's ability to process large volume of transactions and its performance beyond normal levels of operation; and (ii) review the disaster recovery testing plans by including additional preventive	Important	Yes	IMD Director	TBD	At this stage the Murex project is frozen pending the completion and results of the RFP on "IMD IT Architecture Assessment". It is expected that the RFP to be completed in the

MANAGEMENT RESPONSE

Audit of the implementation of the Murex system in the Investment Management Division of the United Nations Joint Staff Pension Fund

Rec. no.	Recommendation	Critical ¹ / Important ²	Accepted? (Yes/No)	Title of responsible individual	Implementation date	Client comments
	controls for ensuring adequate communication and coordination with the master record keeper and custodians.					3 rd quarter of 2014.