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INTEROFFICE MEMORANDUM MEMORANDUM INTERIEUR

OFFICE OF INTERNAL OVERSIGHT SERVICES BUREAU DES SERVICES DE CONTRÔLE INTERNE

INTERNAL AUDIT DIVISION DIVISION DE L'AUDIT INTERNE

TO: Ms. Angela Kane
A: Under-Secretary-General for Management

DATE: 30 January 2009

REFERENCE: IAD: 09-02145

FROM: Fatoumata Ndiaye, Acting Director
DE: Internal Audit Division, OIOS

SUBJECT: **Assignment No. AC2008/514/03 - Capital master plan - audit of the value engineering process**
OBJET:

Value engineering has been applied effectively, but may not prove sufficient to bring the capital master plan back within budget

1. I am pleased to present the report on the above-mentioned audit which was conducted in accordance with the International Standards for the Professional Practice of Internal Auditing.

2. No recommendations are included in this report because the Office of Internal Oversight Services (OIOS) has concluded that the Office of the Capital Master Plan has followed a suitable process for identifying value engineering savings. Audit findings support the conclusion that the Office of the Capital Master Plan has embedded value engineering into its culture and is applying it in a manner that has not compromised the objectives of the capital master plan.

I. INTRODUCTION

3. OIOS conducted an audit of the capital master plan's value engineering process. Value engineering is the process of reviewing the objectives of the project and the actual design work, and finding ways of achieving the same objectives at a lower cost. It is a process that has been applied to the capital master plan as one of the ways of reducing the projected over-expenditure against budget. The Secretary-General's sixth annual progress report to the General Assembly attributed the identification of approximately $100 million in potential cost savings to value engineering. The sixth annual progress report further stated that value engineering efforts will continue throughout the project; however, its scale will be diminishing over time. There is a risk that applying value engineering too rigorously could have an adverse impact on the planned functionality or whole life costs of the building.

4. The Office of the Capital Master Plan indicated that it will not be providing any comments, since no recommendations have been made in the report.

II. AUDIT OBJECTIVES

5. The main objectives of the audit were to:

(a) Assess whether value engineering processes have been applied in a manner consistent with the attainment of best value; and

(b) Determine whether the application of value engineering may impact adversely on the achievement of any of the capital master plan's main objectives.

III. AUDIT SCOPE AND METHODOLOGY

6. A risk-based audit approach was adopted in the examination of value engineering. This conforms with the general approach taken for audits conducted by the Internal Audit Division of OIOS.

7. The audit scope included:

(a) Examination of the processes used to implement value engineering;

(b) The timing of the implementation of value engineering;

(c) Examination of decisions made with regard to design and installations; and

(d) Assessment of the positive effects of value engineering and, if applicable, identification of decisions that could impact adversely on project objectives, or whole life costs.

IV. OVERALL ASSESSMENT

8. Value engineering has been applied effectively by the Office of the Capital Master Plan. However, in view of the reduced scope for value engineering savings, OIOS is of the opinion that value engineering may not prove wholly sufficient to bring the capital master plan back within budget.

V. AUDIT FINDINGS AND RECOMMENDATIONS

A. Examination of the processes used to implement value engineering

9. The United Nations entered into the original design contracts with professional design firms in 2004. These contracts were on a lump sum basis with options for additional services. The contracts contained provisions to promote the attainment of best value. One such provision required the design firms to develop the best possible project within the budget. The budget was not to be exceeded unless prior approval was given by the United Nations. The design firms were required to address any special demands of the project that had a significant impact on the estimated cost and, if it was difficult to meet the approved budget, they were required to include alternatives and/or value engineering to reduce the cost.

10. Additionally, the contracts required the design firms to assist in the review of bids and assist in making a recommendation to the United Nations regarding the contract's award. If bids exceeded the budget by more than 5 per cent, the design firms were

responsible for recommending and implementing, at no additional cost, alternative designs to bring the project back within the approved budget.

11. OIOS consulted with the Office of the Capital Master Plan's Chief, Design and Construction who stated that the design firms had been required to identify value engineering reductions in accordance with their contracts. Value engineering savings totaling $28,191,315 had been implemented in November 2006. Additional savings were identified in July 2007 after further meetings held between the consultant programme managers and the professional design firms, but it was not possible thereafter to keep invoking the contract provisions requiring design firms to undertake further value engineering at no additional cost to the United Nations. This is because the further increased costs were attributable to a number of factors, other than failure on the part of the design firms to design within budget. The following events contributed to a decision by the Office of the Capital Master Plan to enter into an interim arrangement to reimburse the design firms on an hourly (time-card) basis for the time spent supporting the value engineering efforts:

(a) Slippage to the schedule;

(b) Changes in strategy;

(c) Changes in specification, such as blast requirements.

12. In addition to obtaining explanations from the Office of the Capital Master Plan's Chief, Design and Construction, OIOS examined contract amendments and related documents and correspondence. OIOS concludes that the time-card arrangements were necessary as they covered additional services that were beyond the scope of the original contracts. The decision to enter into these arrangements was taken after collaboration between the Office of the Capital Master Plan, the Procurement Division and the consultant programme managers.

13. The fifth annual progress report on the implementation of the capital master plan (A/62/364) dated 28 September 2007 projected a $190.1 million over-expenditure against budget. The report stated that value engineering was being undertaken to find changes in the design work 'that would bring the project back within budget and to find opportunities to reduce costs in a way that does not compromise quality or functionality…'

14. A major initiative was then taken between December 2007 and March 2008 to identify value engineering savings. This exercise involved a series of meetings with designers and consultants and resulted in approximately $100 million in potential cost savings, further reducing the project cost overrun to its current level of $97.5 million. Value engineering efforts will continue throughout the project, however, its scale will be diminishing over time. In view of the reduced scope for value engineering savings, OIOS is of the opinion that value engineering may not prove wholly sufficient to bring the capital master plan back within budget.

15. The value engineering exercise referred to above was led by the staff of the construction manager and the methodology was as follows:

(a) Brainstorming. A four day brainstorming event was held in December 2007. Sessions were organized in advance with procedures and agendas. Attendees included

personnel from the construction manager, the Office of Capital Master Plan, the consultant programme managers, and members of professional design firms. Attendees were divided into 3 groups of up to 25 persons by trade and by project area.

(b) Design development. This was an iterative process involving the Office of the Capital Master Plan, construction manager and design firms in the development of value engineering items through meetings, e-mail narratives, sketches and review sessions.

(c) Estimation of savings (or costs). The construction manager revised estimates in consultation with the Office of the Capital Master Plan, the consultant programme managers and the design firms.

(d) Value engineering log. This was prepared by the construction manager and lists all the items that were identified for consideration.

(e) Presentation. The construction manager and designers presented the value engineering items to the Office of the Capital Master Plan and user representatives.

(f) Evaluation. Further questions and evaluation was carried out by the Office of the Capital Master Plan and user representatives.

(g) Categorization. Value engineering items were categorized as (a) accepted, (b) further study warranted, or (c) rejected.

16. As a result of this intensive value engineering effort, the construction manager produced a two volume 'Value Engineering Study.' This included an executive summary, a summary of the value engineering log, accepted items, further study items, rejected items, plus supporting proposals and drawings. However, this is not the end of the process. As stated in the executive summary of the Value Engineering Study: 'Value engineering on this project is an ongoing task that will continue until the project is complete. The Value Engineering Log is considered a living log that will continue to be updated with new items that will be evaluated, and potentially incorporated, into future design and construction.'

17. The value engineering exercise undertaken between December 2007 and March 2008 has been effective in identifying cost savings of around $100 million. OIOS acknowledges that the value engineering items log will continue to be updated with new items that will be evaluated, and potentially incorporated into future design and construction. For example, some items are the subject of further study. However, the efforts already made support the conclusion that further cost savings are bound to be limited if compromises are not to be made with regard to project objectives, quality, functionality or whole life costs.

B. Timing of implementation of value engineering

18. Logic dictates that a project that is well designed to a predetermined brief will have limited opportunities for value engineering. This is undoubtedly too simplistic a statement and there will always be a need for judgments to be made as the project proceeds. This may be because of factors such as the complexity of the project, the options available to meet project objectives, interdependencies between different parts of the project, different designers' experiences and personal preferences. Also, individual members of the project team will sometimes have different points of view. For example, the construction manager

may be able to review a design and indicate areas where construction costs may be saved if a design is revised. However, OIOS is of the view that value engineering would be most effective if it is applied from the beginning of the project. In this respect, OIOS notes that value engineering is embedded within the culture of the capital master plan and it has been a consideration from the signing of contracts onwards. It is the most important tool in trying to bring the capital master plan back within budget.

C. Examination of decisions made with regard to design and installations

19. OIOS selected a sample of 16 value engineering items spread over the different design contracts. Selection was on the basis of high value and potential for illustrating whether the proposals may compromise any objectives of the capital master plan. Each item was discussed in some detail with the Chief, Design and Construction. For the sample of value engineering items that OIOS examined, 11 out of 16 were accepted and should yield gross savings of around $31.9 million. Two were rejected, and a further 3 items with potential for gross savings of around $9.9 million will be the subject of further study. On the basis of the explanations received, and supporting documentation from the 'Value Engineering Study', the following conclusions were reached:

(a) Sustainability has been a prime consideration.

(b) New York City building codes will be met, and exemptions will not be sought.

(c) Quality is not being compromised.

(d) Due consideration is being given to 'whole life costs.' (For example, cheaper options are not being accepted if they would result in higher maintenance costs in future).

VI. ACKNOWLEDGEMENT

20. We wish to express our appreciation to the Management and staff of the Office of the Capital Master Plan for the assistance and cooperation extended to the auditors during this assignment.

cc: Mr. Michael Adlerstein, Assistant Secretary-General and Executive Director, Capital Master Plan
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