

Report No. 42 of the Director of Audit — Chapter 3

HARBOUR AREA TREATMENT SCHEME STAGE I

Summary

1. The Harbour Area Treatment Scheme (HATS), previously known as the Strategic Sewage Disposal Scheme, is an overall sewage collection, treatment and disposal strategy to deal with water pollution of Victoria Harbour. Implementation of HATS was divided into four stages. HATS Stage I was designed to collect and transfer 75% of the harbour sewage from the urban areas in Kowloon and Northeast Hong Kong Island via a sewage tunnel system to the Stonecutters Island Sewage Treatment Works (STW) for treatment. The further stages of HATS are currently under planning.

Delay in works and increase in cost

2. Planning for HATS Stage I commenced in the early 1990s. The Drainage Services Department (DSD) was responsible for designing and constructing HATS Stage I, which comprised 19 works projects. The original target completion date was June 1997. However, due to problems encountered in the works projects, the final completion date was delayed by 4.5 years to December 2001. While the total approved funding was \$6,211.3 million, additional funding of \$2,287.4 million was later sought to meet the substantial cost increase of the projects. The main cause of delay and increase in cost was the problems encountered in constructing the sewage tunnel system. *The Audit Commission (Audit) has recommended that the Director of Drainage Services should implement effective measures to ensure that large-scale works projects, such as the further stages of HATS, are delivered on time and within budget.*

Forfeiture of the original tunnel contracts

3. The sewage tunnel system comprises six deep tunnels. In December 1994, two contracts for constructing the six tunnels were awarded to the same contractor (Contractor A). In December 1996, the Government re-entered the two contracts as Contractor A unilaterally suspended works. The Government and Contractor A entered into arbitration to deal with the contractual disputes. In September 2001, a Settlement Agreement was signed to terminate all arbitration proceedings. Contractor A also agreed to pay \$750 million to the Government. As a result of the forfeiture of the tunnel contracts, the Government incurred an additional works expenditure of \$1,293 million and legal costs of \$129 million.

4. The outstanding works for the tunnels were re-tendered under three tunnel completion contracts. To reduce the chance of default, the DSD introduced improvement measures in the tunnel completion contracts. The DSD required the contractors to provide parent company guarantee and performance bond (at 10% of the contract sum). However, the duly executed contract instruments were not submitted within the stipulated time limits. *Audit has recommended that the Director of Drainage Services should implement the contract conditions to ensure that the required contract instruments (parent company guarantee and performance bond) are submitted by contractors within the stipulated time limits.*

Problems encountered in the tunnel completion contracts

5. ***Claims arising from use of forfeited plant.*** The contractors were allowed to elect to use the forfeited plant left over by Contractor A. They were required to sign a No Claim Statement to the effect that they had assessed the conditions and suitability of the forfeited plant and that they would not instigate any claim resulting from the use of the forfeited plant. Of the items of forfeited plant used by the contractors, the mucking systems were found to be defective after putting to use at full load. The contractors had to replace the defective mucking systems and submitted claims for the replacement costs. In the event, the Government settled the claims at a total cost of \$135.7 million. *Audit has recommended that the Director of Drainage Services should review the arrangement for the use of forfeited plant in completion contracts with a view to formulating guidelines to protect the Government's interest.*

6. ***Difficult ground conditions.*** Before the tunnel excavation works, site investigations had been conducted to assess the ground conditions. However, the actual ground conditions were found to be worse than those indicated by the site investigations. The contractors carried out additional ground strengthening and stabilisation measures, resulting in additional cost of \$346 million and serious disruption to progress of the works. The DSD acknowledged that the site investigations were not sufficient to reveal the actual ground conditions. *Audit has recommended that the Director of Drainage Services should conduct comprehensive site investigations for major works projects involving substantial underground works to provide more accurate information about the ground conditions.*

7. ***Substantial cost increase in tunnel completion contracts.*** As a result of the replacement of the defective mucking systems and the additional works relating to difficult ground conditions, the three completion contracts experienced significant delay and substantial cost increases. Audit noted that the prices of the accepted tenders were much lower than the estimated contract sums in the approved project estimates (APEs). Despite there are guidelines for adjusting APEs to reflect lower tender prices, the DSD did not reduce the APEs of the tunnel completion contracts. *Audit has recommended that the Director of Drainage Services should take action to reduce the APE of a project when the tender price is significantly lower than the estimated contract sum in the APE, and document the reasons where a reduction in the APE is considered not warranted.*

8. The surplus funds arising from the over-estimation of the contract sums were eventually used to meet the increase in the contract sums. For two of the completion contracts, the total increase in the contract sums was fully covered by the surplus funds. There was no need to seek supplementary provision from the Finance Committee (FC). For the third contract, the surplus was not sufficient to meet the increase in the contract sum. Supplementary provision of \$115 million was sought from the FC. The FC was only informed of the justifications for the additional funding of \$115 million. However, the FC was not informed of the fact that the actual cost increase was \$248.4 million, and that a substantial part of the increase was covered by the over-provision in the APE. *Audit has recommended that the Secretary for the Environment, Transport and Works should remind works departments and relevant policy bureaux to state clearly in their submissions to the FC (seeking an increase in the APE) the total cost increase and the reasons for the increase, and state clearly whether any surplus funds in the APE have been used to meet the cost increase.*

Impact on water quality of Victoria Harbour

9. Since the full commissioning of HATS Stage I in December 2001, there has been a significant improvement in the water quality in Victoria Harbour, especially in the eastern and central harbour areas, and at beaches on the eastern side of Hong Kong Island. The level of dissolved oxygen in the harbour increased, and the levels of pollutants (namely ammonia, total inorganic nitrogen and E. coli) declined. However, there was a substantial increase in the level of E. coli in the western harbour area (where the treated effluent from the Stonecutters Island STW was discharged) and in the Tsuen Wan beaches. Because of the increased bacteria level, four more Tsuen Wan beaches (in addition to the three already closed in the mid-1990s) have been closed since the 2003 bathing season.

10. The high bacteria level in the western harbour area will only be improved when the further stages of HATS are completed in which the treatment level at the Stonecutters Island STW will be upgraded and a permanent disinfection facility installed. *Audit has recommended that the Secretary for the Environment, Transport and Works should consider the need for providing some interim measures to reduce the bacteria level in the western harbour area, having regard to the fact that the further stages of HATS may take many years to complete.*

Response from the Administration

11. The Administration has accepted the audit recommendations.

April 2004