As regards the Chapter 8 of the Director of Audit's Report No. 65
Management of public lighting system

Questions and request for information

Questions to be responded by Highways Department

1. **According to paragraph 1.10, the Highways Department (HyD) contracts out the engineering works to Electrical and Mechanical Services Department (EMSD) who further contracts out the works to external contractors. Why does the Highways Department not undertake the lighting works itself? Under the existing arrangement, which department is the contractor directly responsible to?**

   Answer:

   The operation and maintenance of special lighting installations is entrusted to EMSD through a service level agreement (SLA). EMSD will utilize its resources including employing contractors to carry out the works. Under this arrangement, EMSD is the works agent of HyD, but not a contractor, and the contractors employed by EMSD are directly responsible to EMSD. As such, HyD does not need to create posts for contract management and supervision.

   In 2008, HyD reviewed the above arrangement and found that if HyD had to undertake the contract management for general special lighting, HyD would need to create new posts for establishing a new supervision team. The findings of the review indicated that maintaining the SLA with EMSD was the most cost effective and beneficial arrangement. In particular, EMSD had accumulated sound experiences in maintaining non-traditional road lighting systems such as winches for high mast lights, brightness regulating system for tunnel lights, uninterruptible power supply units, etc. In addition, though operating under a trading fund, EMSD is a professional government department. EMSD's mission was to serve the public instead of making profit and its performance has been very

reliable all along. In case of other road lighting maintenance contractors failing to provide services, EMSD is able to provide backup service so as to minimize the impact to the public. After thorough consideration of the above, our present arrangement of entrusting the operation and maintenance of the special lighting installations to EMSD is appropriate.

2. **According to paragraphs 2.2 to 2.7, 2.9 and 2.11 to 2.13, to ensure a high service level of road lighting, the management, operation and maintenance (MOM) contractors of HyD are required to maintain the monthly availability of the road lighting system in the designated contract areas at not lower than 99.5%. Besides the contractors' daily check on the road lighting systems, HyD carries out night inspections to monitor independently the road lighting availability and the contractors' performance. However, the Audit Commission found that HyD's 51 inspection routes only covered 93 391 (64%) of the total 145 823 road lighting points. Amongst the 52 432 lights not covered by the inspection routes, 14 400 (27%) were directly accessible by vehicles. Moreover, HyD's laid-down requirement for all 51 designated inspection routes to be covered at least once a month was not always strictly observed. For example, in June 2015, 4 out of 27 routes in a region were not inspected while another 17 routes were inspected twice.**

Does HyD have deficiency in monitoring the performance of the contractors? Is there a risk that any outage or substandard performance of the contractors in relation to the uninspected lighting points may not be detected? Are there any improvement measures for monitoring the contractors' performance?

Answer:

Under the current MOM contracts, HyD requires the MOM contractors to carry out regular maintenance and repair works for all road lights in the whole territory under HyD's purview, including annual inspection and lantern cleaning. In addition, the MOM

contractors are required to complete urgent repair works for lighting fault cases within specified time limits. HyD has been monitoring and will continue to closely monitor the MOM contractors' performance to ensure their compliance with the contract requirements. HyD has been conducting audits on the MOM contractors' completed maintenance and repair works regularly and the area of audit covers all the lighting points in the whole territory. Besides, HyD has been carrying out independent night inspections which serve as an additional measure to monitor the performance of the MOM contractors. Overall speaking, HyD has been carrying out various means to monitor contractors' performance for ensuring their compliance with the contract requirements.

Regarding the independent night inspections conducted by HyD, the current nighttime inspection routes mainly cover the locations which are accessible by vehicles so as to carry out additional inspection of those road lights facilities accessible by vehicles. Hence, the coverage of independent night inspections is limited. HyD is maintaining approximately 146 000 road lights within which approximately 93 000 lights are covered by the independent night inspection routes. Amongst the remaining 50 000 lights, about 38 000 lights are village lights or rear-lane and pedestrian-way lights which are not accessible by vehicles. In response to the Audit recommendations, HyD has reviewed the current independent night inspection routes to cover all roads accessible by vehicles including newly constructed roads.

To facilitate the management of the 146 000 nos. of public road lights, HyD has set up a Public Lighting Information System (PLIS) for managing the inspection and maintenance record database. The system has been developed for years. In recent years, the system is becoming unable to satisfy the current operational needs of HyD. Since 2014, HyD has planned to upgrade the PLIS. HyD has commenced to review the PLIS, and has submitted a funding application for upgrading the system with a view to improving the service level of the public lighting system. Before the upgrading of the PLIS, some operations have to be carried out manually, for example, the inclusion of newly constructed roads into the

independent night inspection routes. Regarding the random route selection for the independent night inspection, HyD has been making use of a simple computer program to ensure the randomness of the route selection process. As the computer program was mainly designed to ensure the randomness of the route selection and to prevent manual interruption, there were occasions in which the same route was selected for more than once in a month or was not chosen in the whole month. In response to the Audit recommendations, HyD has improved the route selection computer program to cater for both the randomness of selection and the requirement that all routes have to be selected for inspection at least once a month.

Before the upgrading of the PLIS is completed, HyD will regularly review the independent night inspection routes to ensure the timely inclusion of newly constructed roads into the routes.

3. According to Table 1, HyD's inspections route failed to cover all roads with the highest uncovered rate of 44% in Kowloon and the New Territories East. What is the reason behind? Is it related to inadequate communication within the department? Are there any improvement measures in this respect?

Answer:

Amongst the approximately 14 400 nos. of lamp posts at vehicle accessible roads that have not yet been included in HyD's previous independent night inspection routes, around 12 000 nos. of them are located in Kowloon and New Territories East. Until the upgrading of the PLIS is completed, HyD is required to include the newly constructed roads into the routes manually and the system is unable to give any warning of any roads being left out.

HyD has reviewed the current independent night inspection routes to cover all vehicular accessible roads (including newly constructed roads). Before the upgrading of the PLIS is completed, HyD will regularly review the independent night inspection routes so as to ensure the timely inclusion of newly constructed roads into the routes.

4. According to paragraph 2.8, there were new roads found not being included in the inspection route. Why not? What is the number? And since which year was the new roads not being included in the inspections after their completion? Are there any improvement measures?

Answer:

To facilitate the management of the 146 000 nos. of public road lights, HyD has set up a PLIS for managing the inspection and maintenance record database. The system has been developed for many years. In recent years, the system is becoming unable to satisfy the current operational needs of HyD. Since 2014, HyD has planned to upgrade the PLIS. HyD has commenced to review the PLIS, and has submitted a funding application for upgrading the system with a view to improving the service level of the public lighting system. Before the upgrading of the PLIS, some operations have to be carried out manually, for example, the inclusion of newly constructed roads into the independent night inspection routes and handling of the inspection results.

HyD has reviewed the independent night inspection routes. The review identified 9 nos. of new roads constructed after year 2013 being not included in the inspection routes. They have now been included into the inspection routes. In addition, HyD has put in place measures to ensure all newly constructed roads to be timely included in the inspections routes.

5. According to paragraph 2.9, HyD mentioned that the inspection routes are randomly selected by a computer program and therefore there would be an uneven coverage. Theoretically, the coverage should be even if the selection is done by a computer program. What is the reason for uneven coverage? How is the computer program operated? What are the costs for the design and operation of the computer program? How frequent is the program updated and when was it last updated?

Answer:

In order to ensure the randomness in the selection of independent night inspection routes, HyD has been using a computer program for the route selection since the 4th quarter of 2013 and to arrange for the corresponding inspection. The program is written by HyD staff with no cost of design and operation involved. Through the computer program, inspection routes for any one day are randomly selected from all the routes and the probability of any one route being selected is the same. Given that the requirement for each route to be inspected at least once a month has not been included in the computer program, there were occasions on which some routes had not been selected for a whole month or had been selected more than once in a month. However, in the long run, the frequency of being selected for each route will be similar. In response to the Audit recommendations, HyD has improved the route selection computer program to cater for both the randomness of selection and the requirement that all routes have to be selected for inspections at least once a month.

6. According to paragraph 2.18 to 2.19, there are two time limits for rectifying urgent faults depending on the nature of repairs required, i.e. less than 3 hours if the repair only involves minor adjustment or replacement of minor components, and less than 12 hours for all other urgent fault cases. However, two out of the three contractors applied the 12-hour time limit for measuring all their urgent fault call cases in their reports. HyD has let out 3 contracts at an amount of 693 million but the time limits for urgent fault repair were not implemented effectively. What is the reason?

Answer:

HyD has reviewed the situation in which the two contractors applied the 12-hour time limit for all the urgent fault call cases. Among the total 718 cases of the two contracts, there were 696 cases (about 97%) which the contractors had actually adopted 3-hour as the target time limit and had accordingly completed the repair works within 3 hours,

in compliance with the contract requirements. However, these cases were not properly categorized in the reports submitted by the contractors and were mistakenly grouped under the category of "12-hour repair time limit". Amongst the remaining 22 cases, the time limits for 11 cases were actually 12 hours and the contractors have correctly categorized and handled the cases in accordance with the contract requirements. For the remaining 11 cases that did not comply with contract requirements, HyD will impose payment deduction to the contractors concerned in accordance with the contract provisions. In addition, HyD has reminded the contractors to properly categorize each fault case in the reports submitted so as to reflect the actual handling of the case. Moreover, HyD staff will scrutinize the accuracy of the reports submitted.

7. According to paragraph 2.19, one of the three MOM contractors did not comply with the contract requirement in that many cases which were reported as in compliance in fact exceeded the time limit. And as a result, during the period from June 2014 to May 2015, there were 576 cases of non-compliance not reported. Has the government taken any action against the contractor concerned?

Answer:

According to the MOM contract requirements, time taken for repair works should be counted from the time a fault call is received. However, one of the contractors has mistakenly adopted the acknowledgement time of fault calls as the starting time. HyD has instructed the contractor to adopt the receiving time of fault calls as the starting time in counting the handling time of repair works. HyD is reviewing all the 576 cases as mentioned in the Audit Report. Cost deduction will be made on the cases which have exceeded the time limits in accordance with the contract provisions. Furthermore, HyD has requested the contractors to provide detailed information in their submitted reports on all fault cases including, inter alia, the receiving time, acknowledgement time, arrival time and completion time, so as to reflect the actual handling of the case. Moreover, HyD will also conduct checking on the reports submitted as well as sample

checking on the repair works to ensure the accuracy of the records.

8. According to paragraph 3.2, 3.5 and 3.9, EMSTF outsourced the maintenance works of 74% of the special lighting installations to contractors. However, the equipment availability of 99.5% as stipulated in the SLA has not been incorporated in the sub-contract document. Therefore, EMSTF has no power to require the sub-contractors to meet the same target. In addition, according to the SLA, the patrol service on lighting operations shall cover the special lighting points listed in the SLA and any subsequent additional lighting points during the agreement period. However, there are in total 22 nos. of footbridges/subways/walkways (including 1 887 special lighting points) are not included in the routine patrol. Does the above problem reflect that HyD and EMSTF do not completely incorporate the requirements of the SLA in the sub-contract document? Are there any improvement measures in this respect?

Answer:

The SLA between HyD and EMSD stipulates that the monthly equipment availability shall not be lower than 99.5%. HyD understands that EMSD requires its contractors to complete maintenance works within a time limit in order to achieve the above monthly equipment availability target under the contractual provisions. EMSD has agreed to Audit's recommendation and will incorporate the requirement on monthly equipment availability rate requirement 99.5% in its new contracts.

Regarding the issue on not including some lighting installations in the routine patrol, HyD has established a new database for all special lighting installations since end 2014 and realized in the EMSD database that the name, address and numbering for some lighting installations were different between the databases of HyD, increasing the risk of being left out. HyD understands that EMSD has already carried out rectification. For the 22 footbridges/subways/walkways being left out, 18 footbridges/walkways are included in the SLA and

the remaining 4 footbridges/subways have now been updated in the SLA. HyD understands that EMSD has also updated the 22 footbridges/subways/walkways in its contracts. HyD is now working with EMSD to synchronize the two databases (including aligning all the names, addresses and numbering) which will be regularly carried out in the future to ensure that all footbridges/subways/walkways would be timely included in the routine patrol.

9. According to paragraphs 4.2 to 4.5 and 4.16, as at March 2015, there were 1 534 approved road lights that were pending installation. Among these, 71 numbers (5%) were delayed for more than 3 years and 649 numbers (42%) were delayed for 1 to 3 years. Moreover, as at October 2015, there were 1 461 approved village lights pending installation, and among these, 553 numbers were delayed for more than 3 years. What actions will be taken to expedite the much delayed installation works?

Answer:

Every year, HyD receives proposals for installation of public lighting from different government departments. Upon inclusion of the proposed items in the Public Lighting Programme (PLP) after preliminary assessment, HyD will proceed with the follow-up actions as soon as possible such as carrying out trial pit excavation to ascertain the feasibility of the proposed works. Overall speaking, the major factors affecting the progress of the public lighting installation works are as follows:

1. whether suitable locations for installation of public lighting and suitable routing of lighting cables could be identified;

2. the number of lighting points and the complexity involved in the proposals;

3. the coordination with other road works projects in the vicinity to work out a programme for the public lighting installation works.

If the proposals are found with low feasibility, HyD will liaise with the relevant departments to work out other alternatives or delete the proposed items as appropriate. HyD is now establishing a working group to revisit the proposed public lighting installations included in the PLP. HyD will re-deploy resources to deal with the feasible items according to the time of inclusion in the PLP with an aim to expedite the installation progress. For those items considered not feasible, HyD will timely inform the relevant departments and update the PLP.

For the village lighting, HyD and the Home Affairs Department (HAD) have reached consensus on conducting a comprehensive review over all the applications. The items with prolonged objections that could not be resolved will be deleted from the PLP such that resources can be concentrated on those feasible items. The items deleted will be referred to the departments concerned for follow up action.

10. According to paragraph 4.11, what were the reasons of maintaining the quota of 400 for installation of village lighting in the past 3 years? What is the reason for setting a quota for village lighting?

Answer:

There are two main factors in determining the annual quota of village lighting installation, namely, the resources of HyD and the particular circumstances at the moment concerned.

Before 2011-12, the annual quota for village lighting installations was maintained at about 600. In 2007, there was a backlog of about 3 000 applications for village lights. HAD applied for a special funding allocation with an aim to deal with the backlog. Although the funding application was not approved, HyD re-deployed internal resources to handle the backlog and processed 4 700 applications in three years from 2008 to 2011.

The annual quota returned to 600 in 2011-12 after the clearance of the above mentioned backlog. However, the subsequent applications were mostly at scattered locations. Compared with the past applications in which new village lights were requested on a single village road section, applications in recent years involve mostly the installation of an additional village light in scattered locations or to improve the illumination locally on village roads that already have village light. More time is needed to process these applications and complete the installation of the same number of village lights. In addition, owing to the development in village areas in recent years, there have been a large number of requests for relocating the existing village lights and lighting cables, which need urgent handling and thus consumes a lot of the resources originally assigned for handling the new village light installations. Considering the factors including applications in scattered locations; substantial increase in requests for relocating existing village lights and lighting cables, the actual resources available and the need to deal with the existing cases pending installation, HyD has decided an annual quota of 400 since 2012-13.

Highways Department
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