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(ACE Paper 28/97)
for discussion

Trade Effluent Surcharge Review

Purpose

This paper reports the outcome of the consultancy review of the Trade Effluent Surcharge (TES) scheme and briefs Members on the key findings and recommendations.

Background

2. The sewage charging scheme is an effort to improve the protection of our environment. It is based on the Polluter Pays Principle which requires that all who create pollution pay their fair and proportionate share of the costs of cleaning it up. A Sewage Services Trading Fund (SSTF) within the Drainage Services Department was set up to collect the sewage charges and to operate and maintain our sewage collection and treatment systems.

3. The sewage charging scheme comprises two components - a sewage charge (SC) and a TES. SC is a general charge payable by all water consumers discharging waste water into the public sewerage system. Certain trades and industries discharge effluent at a strength higher than that of domestic sewage. As a result, a TES which reflects the additional cost of treating this stronger sewage is payable by 30 trades and industries. As the strength of effluent of different types of commercial and industrial establishments varies, different TES rates are applicable to reflect the difference in treatment costs.

4. The strength of effluent is measured by the Chemical Oxygen Demand (COD) readings of waste water. The higher the COD value, the higher the treatment cost and hence the higher the TES rate. The volume of effluent discharged is determined based on the metered water supply data. It is recognised that for some trades not all water supplied would be discharged direct to sewers because some water is used in products or lost to atmosphere via evaporation. A system of discharge factors is therefore employed to allow for such losses.

5. The Sewage Services Ordinance was passed in December 1994, and the two regulations detailing the scheme, viz the Sewage Services (Sewage Charge) Regulation and the Sewage Services (Trade Effluent Surcharge) Regulation, were passed in April 1995. The sewage charging scheme was implemented on 1 April 1995. Prior to implementation of the TES scheme, the Administration gave an undertaking to this Council that the TES scheme would be reviewed a year after its implementation because of its complexity.

Problems Encountered with the Trade Effluent Surcharge Scheme

6. Since the introduction of the charging scheme, the restaurant trade, which is responsible for the majority of the TES payments, has objected strongly to the methods for charging TES. The hotel industry, which is itself not a TES payable trade, also objected because the restaurants, laundries, and bakeries inside hotels are TES payable trades. Some other TES payable trades have also expressed various views from time to time.

7. The criticisms expressed by the trades included the use of COD as the sole parameter in assessing the effluent strength, the use of one generic COD value for a trade, the inaccuracy in assigned COD generic values and discharge factors, and the costly appeal procedure.

The Review

8. ERM-Hong Kong Ltd (ERM) was commissioned by the Environmental Protection Department to undertake the review which commenced on 2 October 1996. The scope of the review has been as follows :-

- (i) to review all aspects of the current TES scheme and to advise on any necessary modifications;
- (ii) to compare the current Hong Kong TES scheme with similar schemes in other comparable parts of the world and to identify aspects of those schemes which may be applicable in Hong Kong, with reference to any advantages and disadvantages;
- (iii) to examine the financial implications for the Sewage Services Trading Fund (SSTF); and
- (iv) to develop draft legislation, if amendments of the TES scheme are required.

9. Prior to the commencement of the review, meetings on the objectives and scope of the review were held by the Administration with representatives of trades, including the restaurant trade and LegCo members. The views collected were incorporated into the study brief.

Final Report (FR)

10. The FR (to be tabled at the meeting) presents the key findings of the review on the current TES scheme; identifies and evaluates a number of options for possible changes to the current scheme and then presents recommended options for changes to components of the scheme; and suggests improvements to the TES scheme. A review of overseas charging schemes is also included in the FR.

11. As part of the review, a consultation programme was undertaken from November 1996 to January 1997, during which meetings with trade associations affected by the TES scheme and concerned political parties were arranged and a public forum was held. The views expressed at these meetings and the forum have been considered in the review and are provided in the FR.

Key Findings

International Review

12. The consultant has studied trade effluent charging schemes in six countries : Australia (Melbourne, Perth and Canberra), the PRC, Japan (Tokyo), Singapore, UK (England and Wales) and the USA (California). There are considerable differences in these schemes due to different objectives and local characteristics. The review shows that there is a key difference between approaches in that schemes in California, England and Wales, Singapore and Tokyo aim to fully recover capital and operating costs associated with the provision of sewage services, whereas the approach in Hong Kong is to recover operation and maintenance costs only. Broad comparisons suggest that Hong Kong charges are generally lower than charges implemented in these countries. The consultant has therefore concluded that Hong Kong consumers are getting a "good deal" in comparative terms.

Generic COD Strengths

13. The consultant has conducted an assessment of the available monitoring data, with the objective of reassessing the assigned COD values. Particular attention was given to the review of value for the restaurant trade. Three types of data have been examined :

- (a) EPD regulatory compliance monitoring data;
- (b) data for composite samples submitted to DSD as part of the appeals process; and
- (c) the survey conducted by the restaurant trade in 1995.

The overall conclusion is that the available data do not provide a sufficiently robust basis for the revision of generic COD values. Regarding the restaurant trade in particular, the review indicates that there is insufficient evidence to justify changing the current TES generic value of 2000 mg/L.

Charging Parameters

14. The consultant has examined a number of charging parameters and confirmed that using COD as the charging parameter is appropriate because it reflects the strength of effluents discharged by the trades in Hong Kong and because COD tests are simple, inexpensive and by comparison with other systems, less time consuming and less sensitive to interferences from nitrification. However, the consultant considers that while COD is a good measure of effluent load for secondary treatment, it is not particularly representative of load effects during primary treatment. The consultant therefore suggests that the measure of oxygen demand of solids settled by primary treatment should be replaced by another parameter, the Total Suspended Solids (TSS), to reflect more accurately the costs of primary treatment, as TSS directly measures the parameter which primary treatment is designed to address, namely the solid levels in the effluent. The technical basis for charging will then become a combination of TSS and the oxygen demand that remains in the effluent following settlement of solids, measured as COD_{settled}.

Discharge Factors

15. It is found that for six trades, the observed discharge factors are significantly below those assigned. It is therefore suggested that further investigation would be required to determine the specific discharge factor for each of these trades. Given the importance of the restaurant trade, the discharge factor of the existing database has been verified by additional measurements. These measurements indicate that the assigned discharge factor for the restaurant trade is close to the measured value.

Appeals

16. The current requirement for traders to seek an annual review is found to be costly to both the traders and DSD, unfair to small establishments and inefficient.

Trading Fund Finances

17. Using SSTF's projections, the consultant has carried out a financial analysis of the current and future self-financing capabilities of the SSTF through the levying of sewage charges. The main findings are :

- (a) the total operation & maintenance (O&M) costs of sewage collection and treatment are expected to triple (in current price terms; assuming inflation at about 8%) from \$640 million in 1995/96 to \$1748 million in 2000/01 by which time all elements of Stage I of the Strategic Sewage Disposal Scheme (SSDS) will have been completed. The rise in costs reflects the commissioning of the Stonecutters Island Sewage Treatment Works (SISTW) and the upgrading of the sewer network. Thereafter, future increases in costs to be recovered will depend on the impact of further investment in Stages II to IV of the SSDS.
- (b) based on existing charge rates, which have not been revised since their introduction, the SSTF showed a surplus of \$50 million in 1995/96, but this will be reversed to a deficit of \$118 million in 1996/97 due in part to a real fall in revenues from the TES following the universalisation of Water Control Zones and in part due to increased costs in the commissioning of additional facilities. This deficit will rise to over \$1 billion in 2000/01, if inflation is taken into account.

TES Costs and Revenues

18. The calculation of TES costs is a complicated process and relies on many assumptions. When the scheme was derived, it was intended to be simple and uniformly applied across the territory. Following recommendations made by the consultants which advised the Government on setting up the sewage charging scheme, the TES charge was based on the simple approach of applying the unit cost of treatment to all trade effluent loads. In this way all TES payers participate equally in the "polluter pays" responsibility to generate revenue for environmental improvement. Legislative Council endorsed the scheme on this basis. Charges were set at levels which were assessed, based on the information then available, as being adequate to recover current costs with annual increases necessary to cover inflation and other cost increases.

19. The consultant has found that the TES revenues were contributing more than the associated direct O&M costs of treating trade effluent in the first two years of implementing the charging scheme. However, the direct O&M

costs represent only about 30% of the full total costs of development and operation of sewerage facilities. Furthermore, as the Stonecutters Island Sewage Treatment Works becomes operational, the relation between TES costs and revenues will alter significantly. The consultant has estimated that if revenues do not increase with rising costs and inflation, the TES will, by 2000/01, be undercharging traders and only 61% of direct O&M costs will be recovered. By 2005/06, this will drop to 40%.

Administrative Costs

20. In 1996/97, the TES related administrative costs were estimated to be some 20% of total revenues raised by the TES. The consultant has pointed out that this compares unfavourably to other international revenue collection schemes which often cost only between 5 to 10% of revenue to administer. However, the scheme in Hong Kong is complicated and relatively expensive to administer because of the large number of trade categories and account holders which do not generate significant levels of revenue and the large number of appeal cases to be handled. It should be noted that in contrast with many overseas schemes, TES charges and thus revenue collected do not reflect the full cost (i.e. including depreciation and return on capital) but only O&M costs. If full costs were recovered, the administration cost of the scheme would represent less than 10 % of revenue.

Consultant's Major Recommendations

21. Some of the consultant's recommendations are explained in previous paragraphs under "Key Findings". The consultant's other major recommendations are highlighted below :

(a) Charging Rate

The consultant has proposed that the TES revenue requirements should be adjusted annually in line with an appropriate published price index but reduced downward by a pre-determined efficiency factor, and also adjusted to reflect the provision of additional and improved services.

(b) Chargeable Population

The consultant has proposed expanding the coverage by increasing the number of accounts within existing Schedule 1 trades, increasing the number of chargeable trades, and introducing individual accounts not covered by Schedule 1 trades.

(c) Determination of Effluent Quality

The proposal is to move away from generic strength based on industry categories and allow individual appeal by actual measurements towards a link with licensed discharge values under the Water Pollution Control Ordinance. In the interim, the cost of appeal by individual measurement will be lowered.

(d) Appeals/Reassessments

The proposal is to simplify the 'appeals' procedure, to turn it into a 'reassessment' exercise between government and the trader, and to extend the validity of the appeal result.

(e) Fundamentally Revised Scheme

The consultant has proposed two major revisions to the TES. One is to move to a Trade Effluent Charge where all trades and industries have a unified charge matrix (SC plus TES), whilst the existing SC is retained for domestic users. The other proposal goes a stage further and proposes a Universal Sewage Charge that would encompass every customer discharging to sewers.

Presentation

22. The consultant will attend the ACE meeting on 21 April 1997 to present their findings and recommendations to Members.

The Way Forward

23. The LegCo EA Panel will be consulted on the FR on 29 April. This will be followed by a six-week consultation period during which written comments will be invited from relevant trade and industry associations. Special meetings with these associations will be arranged on request. Thereafter the Administration will consider and decide on the consultant's recommendations. Before we make any changes to the current charging scheme, we will consult this Council again.

Advice Sought

24. Members are invited to note and comment on the findings and recommendations of the TES Review. Members are also welcomed to provide further comments on the FR in writing to the PELB before the end of the public consultation period on 10 June 1997.

**Planning, Environment and Lands Branch
17 April 1997**