

ITEM FOR FINANCE COMMITTEE

CAPITAL WORKS RESERVE FUND

HEAD 710 - COMPUTERISATION

Labour Department

New Subhead “Occupational Safety and Health Management Information System”

Members are invited to approve the creation of a new commitment of \$25.8 million for the implementation of an Occupational Safety and Health Management Information System in the Labour Department.

PROBLEM

At present, the management of occupational safety and health information in the Labour Department (LD) is mainly performed manually. This is inefficient and cannot meet increasing service demands.

PROPOSAL

2. The Commissioner for Labour (C for L), with the support of the Secretary for Education and Manpower and on the advice of the Director of Information Technology Services, proposes to implement a computerised Occupational Safety and Health Management Information System (OSHMIS) to enhance efficiency and meet service demands.

JUSTIFICATION

Problems with the Existing System

3. The Occupational Safety and Health Branch (OSHB) of LD is responsible for enhancing the safety of all sectors of employment through

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enforcement of relevant legislation, provision of safety and health training and advice and publicity to the public. It provides a wide variety of services including occupational accident and ill-health investigation, occupational medical consultation, safety and health consultation, safety auditing and advice on safety management. In discharging its functions, OSHB has to maintain some 130 000 workplace safety and health records, administer five safety and health registries, analyse and produce work-related accident and illness statistics. At present, OSHB carries out most of these operations manually, and the remote offices maintain their own case files and independent filing systems. This has hampered the work of OSHB in the following areas -

- (a) a large number of records are kept manually in paper files stored in more than 60 district offices. This inhibits OSHB from retrieving structured safety and health information for strategic planning in a timely manner;
- (b) there is no data communication network to link up field occupational safety officers (OSOs) with their supervisors and LD Headquarters. Field OSOs do not have remote access to useful information such as OSH statistics, safety registries, legal advice, court rulings and other reference materials, and may have difficulty in seeking the management's advice and authorisation on the spot during critical situations. Hence, they may not always be able to give timely warnings and advice to rectify unsafe conditions which may lead to serious accidents;
- (c) manual indexing and searching of workplace records at the central filing registry is labour intensive and not cost-effective;
- (d) most of the performance management reports, accident and prosecution statistics are compiled manually which is time consuming. Delays in key statistics production affects OSHB's ability to respond quickly to new hazards; and
- (e) transfer of information within OSHB is far from efficient and effective owing to the lack of interface between various micro-scale computer systems. In many cases, information has to be transferred in hard copies.

The Proposed System

4. To remedy the above deficiencies, C for L proposes to develop a computerised management information system, namely, OSHMIS, for OSHB. The proposed OSHMIS will -

- (a) establish a communication network connecting the Headquarters and the district offices;
- (b) provide a complaint handling system to maintain a centralised database of all complaints received and handled;
- (c) automate the submission of legal documents and applications by the public through the Internet, such as the notification of workplaces and construction sites, the notification of occupation diseases, and the application for registration as safety officer;
- (d) provide a performance monitoring system to automate the assignment of cases, the monitoring of work progress and the distribution of workload;
- (e) facilitate the capturing and sharing of occupational safety and health information such as workplace records, accident information, patient details, occupational diseases, codes of practice, safety and health registries and references, etc.;
- (f) assist in the compilation of reports on enquiries, statistical data and other management information for operational and planning purposes;
- (g) enable the public to access occupational safety and health reference materials through the Internet;
- (h) provide office automation facilities such as electronic mail and standard software; and
- (i) enable system interface with other computer systems in LD.

Benefits of the Proposed System

5. The proposed OSHMIS will provide important occupational safety and health information to OSHB for strategic planning, policy formulation and identification of problems. It will also improve the services provided to the public. Employers will be able to obtain occupational safety and health information from the Internet to help them in their safety management and in discharging their legal responsibilities. Most important of all, the proposed system will help prevent accidents through enhancing OSHB's performance in law enforcement, education, training and promotion. Specifically, the proposed OSHMIS will bring about the following benefits.

(a) ***Improve strategic planning and policy formulation***

The proposed system will facilitate the monitoring of trends and patterns of accidents/occupational illness in various industries and reduce the time for preparing detailed analysis of accident statistics by 75%. This will enable OSHB to identify high-risk areas or hazardous processes and map out programmes and initiatives to prevent work-related accidents and occupational illnesses in a proactive manner. With the availability of the most-updated information on accident and illness trends, employment size, machinery and chemicals used, new processes and hazards in various industries, OSHB can objectively evaluate the effectiveness of its operations and campaigns and fine-tune its strategy and action plans. Better strategic planning and policy formulation will help reduce the number of occupational accidents and illnesses.

(b) ***Reduce the lead-time for issuing suspension and improvement notices***

The proposed system will provide accurate records of workplaces and establishments including the number of accidents, warnings issued, previous convictions, machinery and chemicals used. This will help identify the problematic workplaces or establishments for appropriate enforcement action and enable OSOs to give immediate warning/advice and to make on-the-spot decisions on prosecution. When investigating serious accidents, OSOs will be able to communicate with their supervisors in office through notebook computers and wireless modem and obtain approval for the issue of suspension or improvement notices on the spot. The time required to issue fire precaution notices and prohibition notices, which have to be approved at senior levels, can also be reduced from five days to three days.

At the same time, field OSOs, while following up a suspension notice, can seek approval on the spot from their seniors to revoke a suspension notice. We expect that suspension notices can be revoked at least half a day earlier than under the existing arrangement. Early resumption of normal operation in the affected workplaces will minimise loss of production and will be most welcome by the business community.

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(c) ***Expedite the transmission of safety and health information***

The proposed system will allow field officers to transmit live images of serious accident scenes to the Headquarters for senior management's information and instruction within half an hour on arrival. The current practice of taking photographs requires at least three hours for the images to reach the Headquarters. The proposed system will also provide online information sharing with all offices and reduce the time for making reference to OSH related information from ten days to instant.

(d) ***Improve management of staff resources***

The proposed system will enable the management to deploy staff resources more efficiently. Compilation of performance management reports will be reduced from ten days to five days. The proposed system will provide electronic mail services to facilitate internal communication between officers.

(e) ***Enhance safety and health services to public***

The proposed system will speed up the information searching process by OSOs to enable them to give comprehensive replies to common public inquiries instantly. The proposed system also enables the public to access OSH information and submit applications through the Internet. Replies to applications for training course and safety officer registration will be reduced from four days and three days respectively to one day.

(f) ***Bring social economic benefits***

The high accident figure and compensation paid out have inflicted heavy losses to the community in terms of manpower and financial cost. The hidden costs arising out of these accidents, in terms of stoppages of work, plant damages, medical expenses and legal cost, are estimated to be several times the amount of compensation paid out. Accident prevention is a shared responsibility amongst employers, employees and the government. We anticipate that improvements to OSHB's operational efficiency and enhancement to the society's safety culture brought about by the proposed system will further encourage both employers and employees in preventing accidents and illness. The anticipated reduction in the number of accidents and illnesses upon the implementation of the proposed system can contribute to the reduction of compensation paid out and other hidden costs incurred to society.

/Cost

Cost and Benefit Analysis

6. We expect the proposed OSHMIS will bring about total annual savings of \$10.8 million. This comprises –

- (a) **realisable savings** of \$6.1 million per annum. This includes annual staff savings of \$4.6 million, being the annual staff cost of two Occupational Safety Officers II, ten Assistant Clerical Officers, three Clerical Assistants and savings of \$1.5 million on photocopying and printing of OSH publications.
- (b) **notional staff savings** of \$4.7 million per annum. These savings cannot be realised because they comprise the fragmented staff savings of 13 different ranks including officers and clerical staff in 12 divisions and units. However, as staff are relieved of manual operations, their time and efforts can be diverted to more useful work, thus bringing about enhanced productivity.

Encl. 7. A detailed cost and benefit analysis is at the Enclosure. We anticipate that the system will break even in 2008-09.

FINANCIAL IMPLICATIONS

Non-recurrent Expenditure

8. The estimated total non-recurrent cost of the proposed system is \$26.7 million. This comprises \$25.8 million non-recurrent expenditure for the acquisition of computer hardware and software and related implementation services, which is the commitment sought in this submission, and another \$0.8 million for in-house development staff, which will be absorbed by LD. A breakdown is as follows –

	2000-01 \$'000	2001-02 \$'000	2002-03 \$'000	Total \$'000
Non-recurrent expenditure				
(a) Hardware and software	0	4,291	2,272	6,563
(b) Data communication	0	530	133	663
(c) Implementation services	424	3,231	4,502	8,157
(d) Hire of contract staff	1,499	2,632	1,263	5,394

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	2000-01 \$'000	2001-02 \$'000	2002-03 \$'000	Total \$'000
(e) Site preparation	0	520	641	1,161
(f) Training	0	228	57	285
(g) Data conversion	0	964	241	1,205
(h) Consumables	0	51	13	64
(i) 10% contingency of the total non-recurrent expenditure	0	0	2,349	2,349
Sub-total	1,923	12,447	11,471	25,841
Other non-recurrent staff cost				
(j) LD staff cost	296	445	74	815
Sub-total	296	445	74	815
Total	2,219	12,892	11,545	26,656

9. As regards paragraph 8(a), the expenditure of \$6,563,000 is for the acquisition of computer hardware, software and networking equipment, including six servers, 192 workstations, printers, application software and the required equipment for the disaster recovery centre.

10. As regards paragraph 8(b), the expenditure of \$663,000 is for the acquisition of data communication equipment and for the payment of rental charges for communication lines during the project implementation period.

11. As regards paragraph 8(c), the expenditure of \$8,157,000 is for acquisition of implementation services, including package product licence fee and customisation of the application software.

12. As regards paragraph 8(d), the expenditure of \$5,394,000 is for employing contract staff by both Information Technology Services Department (ITSD) and LD for tendering, monitoring of system development and system implementation, building of system interface with other computer systems in LD etc. This comprises 11 man-months of Contract Senior Project Manager, 22 man-months of Contract Project Manager, 22 man-months of Contract Systems

/Analyst

Analyst and 33 man-months of Contract Occupational Safety Officer I. In view of the importance of the project, ITSD and LD may need to engage contract staff funded from this commitment for other assignments so as to release some in-house staff for implementing OSHMIS.

13. As regards paragraph 8(e), the expenditure of \$1,161,000 is for site preparation work including the renovation of computer data centre and associated installations.

14. As regards paragraph 8(f), the expenditure of \$285,000 is for the training of LD staff in using OSHMIS.

15. As regards paragraph 8(g), the expenditure of \$1,205,000 is for the hiring of services to convert existing data into OSHMIS.

16. As regards paragraph 8(h), the expenditure of \$64,000 is for acquisition of initial consumables such as magnetic tapes during implementation.

17. As regards paragraph 8(i), the expenditure of \$2,349,000 represents a 10% contingency on the cost items set out in paragraphs 8(a) to (h).

18. As regards paragraph 8(j), the expenditure of \$815,000 represents the staff costs of six man-months of Deputy Chief Occupational Safety Officer required by LD for monitoring the system implementation. LD will absorb this staffing requirement by internal redeployment.

Recurrent Expenditure

19. The estimated recurrent expenditure for maintaining and supporting the OSHMIS is \$5.5 million per annum. In addition, recurrent staff effort from ITSD and LD are also required for on-going user support and system administration. The total recurrent cost of the proposed OSHMIS is estimated to be \$6.7 million per annum. A detailed breakdown of the items is as follows –

/Recurrent

	2002-03 \$'000	2003-04 onwards \$'000
Recurrent expenditure		
(a) Hardware, software and application maintenance	1,434	1,434
(b) Data communication	676	985
(c) On-going support services	1,479	1,775
(d) Hire of contract staff	424	509
(e) Miscellaneous	749	749
Sub-total	<u>4,762</u>	<u>5,452</u>
Recurrent staff cost		
(f) ITSD staff cost	429	515
(g) LD staff cost	575	690
Sub-total	<u>1,004</u>	<u>1,205</u>
Total	5,766	6,657

20. As regards paragraph 19(a), the annual expenditure of \$1,434,000 is for the maintenance of hardware, software and application.

21. As regards paragraph 19(b), the annual expenditure of \$985,000 is for payment of rental charges for communication lines.

22. As regards paragraph 19(c), the annual expenditure of \$1,775,000 is for hiring of service to provide on-going support and maintenance.

23. As regards paragraph 19(d), the expenditure of \$509,000 represents the staff costs of 12 man-months of Contract Systems Analyst for providing on-going maintenance support for interfacing the proposed system with other computer systems of LD.

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24. As regards paragraph 19(e), the annual expenditure of \$749,000 is for payment of various OSH reference materials loyalty fees, purchase of consumables, and electricity cost of the 24-hour air-conditioning of the computer centre.

25. As regards paragraph 19(f), the expenditure of \$515,000 represents the annual staff cost of one man-month of Senior Systems Manager and four man-months of Systems Manager for supporting the system operation.

26. As regards paragraph 19(g), the expenditure of \$690,000 represents the annual staff cost of six man-months of Occupational Safety Officer I and 12 man-months of Occupational Safety Officer II for supporting the system operation.

27. The project will start to incur recurrent expenditure of \$4.8 million in 2002-03 rising to \$5.5 million in a full year from 2003-04 onwards. This will be fully offset by the realisable savings of \$6.1 million per annum (paragraph 6(a) above) arising from the computerisation. As for the recurrent staff costs, ITSD and LD will absorb these requirements from within their existing resources.

Implementation Plan

28. LD will start the project tendering procedures once funding approval is available. We estimate that the project will be implemented in about 14 months after completion of the tendering exercise. The proposed implementation timetable is as follows -

	Target completion date
Project tendering	December 2000
System analysis and design	June 2001
System customisation	November 2001
System live run	February 2002

BACKGROUND INFORMATION

29. There is growing public awareness of, and concerns about, occupational safety and health. In view of the substantial social cost arising from the large number of occupational injuries each year, it is important to improve safety and health at work which in turn will reduce accidents. Government is committed to minimising the risks to people's safety and health at work by legislation, education and promotion. The work includes enforcement of the

Occupational Safety and Health Ordinance, the Factories and Industrial Undertakings Ordinance and Boilers and Pressure Vessels Ordinance. A key element in enforcement is the provision of advice on prevention of accidents. Apart from providing training courses, seminars, guide books and other publicity materials, special promotional visits are conducted to encourage employers to adopt a self-regulatory approach at the workplace. Suspension notices will be issued to remove imminent risk to lives and limbs. Improvement notices will be issued to secure a speedy rectification of irregularities to prevent accidents arising from such hazards.

30. We informed the Manpower Panel of the Legislative Council of the proposed OSHMIS on 25 May 2000. Members supported the proposal.

Education and Manpower Bureau
May 2000

**Cost and Benefit Analysis of Implementation of
Occupational Safety and Health Management Information System in Labour Department
(at 1999-2000 price level)**

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	Total
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
COSTS										
<i>Non-recurrent</i>										
Expenditure	1,923	12,447	11,471	0	0	0	0	0	0	25,841
Staff cost	296	445	74	0	0	0	0	0	0	815
Sub-total	2,219	12,892	11,545	0	0	0	0	0	0	26,656
<i>Recurrent</i>										
Expenditure	0	0	4,762	5,452	5,452	5,452	5,452	5,452	5,452	37,474
Staff costs	0	0	1,004	1,205	1,205	1,205	1,205	1,205	1,205	8,234
Sub-total	0	0	5,766	6,657	6,657	6,657	6,657	6,657	6,657	45,708
Total costs	2,219	12,892	17,311	6,657	6,657	6,657	6,657	6,657	6,657	72,364
BENEFITS										
Realisable savings	0	0	5,061	6,073	6,073	6,073	6,073	6,073	6,073	41,499
Notional savings	0	0	3,945	4,734	4,734	4,734	4,734	4,734	4,734	32,349
Total benefits	0	0	9,006	10,807	10,807	10,807	10,807	10,807	10,807	73,848
Net benefits	(2,219)	(12,892)	(8,305)	4,150	4,150	4,150	4,150	4,150	4,150	1,484
Cumulative benefits	(2,219)	(15,111)	(23,416)	(19,266)	(15,116)	(10,966)	(6,816)	(2,666)	1,484	