



LALUGO-E

1-2-3-4 4000ML/STELL

1	2	3	4
5	6	7	8
9	0	1	2
3	4	5	6
7	8	9	0

1	2	3	4
5	6	7	8
9	0	1	2
3	4	5	6
7	8	9	0

20:00

把車身沖洗得一塵不染，光潔如新。
Maintaining a shiny and dust-free body.



資產管理

ASSET MANAGEMENT

水是生命之源
Water's
Life

- 資產管理計劃
Asset Management Plans
- 資產更換計劃
Asset Replacement Programmes
- 資產保養
Asset Maintenance
- 水管爆裂
Mains Bursts
- 滲漏控制
Leakage Control
- 風險及危機管理
Risk and Crisis Management

實行有效的資產管理和減低服務故障的風險，對我們履行向客戶提供優質供水服務的



承諾至為重要。

Effective management of our assets and of any risks to our service delivery is crucial to our ongoing commitment to provide a quality water service.

資產管理 ASSET MANAGEMENT

資產類別

本署的基礎設施資產主要分為地面和地下資產兩大類。地面資產包括水塘、配水庫、濾水廠、抽水站、隧道和樓宇，而地下資產則包括水管、管道和電纜。

資產管理計劃

年內，我們按照地下資產管理計劃，繼續致力監察供水網絡的狀況和性能。我們採用數碼繪圖系統更新地下資產記錄，並通過在二零零二年九月啟用的電腦系統，與公用事業公司和其他政府部門迅速交換數碼資產記錄，從而大大減低地下供水網絡遭挖掘工程損毀的風險。

本署正在制定地面資產登記冊及地面資產管理計劃，將於二零零四年完成。

資產更換計劃

為減少水管滲漏和爆裂事件，本署於二零零零年展開了在20年內更換或修復約3 000公里水管的計劃，估計費用為100億元。這項計劃的第一階段工程包括更換或修復350公里水管，定於二零零八年完竣。

在地面資產管理計劃擬備後，本署會制訂一項為期20年的地面資產更換計劃。年內，大口環食水抽水站和鯽魚涌海水抽水站的水泵更換工程已告完成。為28座水務設施更換水泵以提高能源效益的工程，現正按計劃進行。



在機械工場內打磨水泵泵殼。
A pump casing being machined in Mechanical Workshop.

資產保養

我們致力進行有效的資產保養工作，並採取預防措施，確保供水服務穩定可靠。

■ 土木工程設施

我們按原定計劃，繼續為土木工程設施如配水庫、斜坡、通路等進行修葺及維修工程。

■ 機電設備

我們為機電設備制定和實施了全面的預防性保養維修計劃，確保本署供水系統更穩當可靠。年內，經保養或維修的機電和儀器設備約達58 000部。我們亦進行狀態監察和效能測試，藉以修訂檢修和更換計劃的優先次序。



現場檢查和維修大型水泵。
A large water pump being inspected and repaired on site.



測試大型水錶的準確程度。
Conducting accuracy test on a large water meter.

TYPES OF OUR ASSETS

Our infrastructure assets comprise mainly surface and underground assets. Surface assets include impounding and service reservoirs, water treatment works, pumping stations, tunnels and buildings whereas underground assets are composed of water mains, pipework and cables.

ASSET MANAGEMENT PLANS

During the year, we continued to focus a great deal of attention on monitoring the performance and conditions of our water supply network in accordance with the Underground Asset Management Plan. Digital Mapping System has been used for updating underground asset records. The computer system for the speedy exchange of digital asset records with utility companies and other government departments was commissioned in September 2002 and this greatly reduced the risk of damage to the underground network due to excavation work.

Both the Surface Asset Register and Surface Asset Management Plan are under preparation and will be available by 2004.

ASSET REPLACEMENT PROGRAMMES

For cutting down leakage of water mains and incidents of mains bursts, a 20-year programme



安裝地下水管工程進行中。
An underground water main being laid.

commenced in 2000 to replace or rehabilitate some 3 000 kilometres of water mains at an estimated cost of \$10 billion. Stage One of the project, covering 350 kilometres of water mains, is scheduled for completion in 2008.

A 20-year surface asset replacement programme will be developed upon the completion of the Surface Asset Management Plan. The pumping plant replacement for Sandy Bay Fresh Water Pumping Station and Quarry Bay Salt Water Pumping Station was completed in the year. Meanwhile, work on programmed replacement of pumping plant of 28 installations to improve energy efficiency continued.



為水務設施安裝新保安圍網。
Erecting new security fencing for a waterworks installation.

ASSET MAINTENANCE

We are committed to undertaking effective maintenance of our assets and taking preventive measures to ensure a continuous and reliable water supply service.

資產管理 ASSET MANAGEMENT



員工正搶修一條爆裂水管。
A burst water main being repaired.



工作人員正為一個剛完成維修的電動機轉子作轉動平衡測試。
A repaired electric motor rotor being tested on a dynamic balancing machine.

■ 水塘安全檢查

年內，安全檢查次數增加了17%，至1 468次。為節省開支，我們已把17個水塘、11個灌溉水塘及139個配水庫的部分檢查工作外判予顧問公司。

■ 斜坡安全檢查

本署轄下約6 000個斜坡的安全檢查工作，已外判予顧問公司。第一輪的檢查已經完成，所蒐集的資料可作為編訂斜坡維修工程優先次序的依據。

水管爆裂

本署積極推行水管更換及修復計劃，並加強預防性保養和喉坑檢查工作，

因此，水管爆裂次數在過去兩年穩步遞減。此外，由於精簡了爆水管事件的處理程序，我們在縮短關水閘和恢復供水所需時間方面，續有改進。

滲漏控制

為減低因水管滲漏而流失的水量，我們採取了國際上先進的滲漏測試技術及最佳的防漏管理方法。有關的防漏管理策略包括：

■ 水壓管理

在13項小規模的水壓管理計劃試行成功後，我們現正把採用新式流量調控減壓閥進行水壓管理的計劃，推展至兩個大型供水區，有關工作定於二零零三年年底完成。

■ 主動滲漏檢測

我們增加了區域檢測區的數目，並在檢測區內裝設GSM數據記錄儀，藉以對供水網絡進行持續監測。另外又使用聲音數據記錄儀找出經常滲漏之處，以減低測漏的成本。

■ 水管更換計劃

在二零零零年展開、為期達20年的水管更換及修復計劃，現正繼續進行。

■ 迅速維修滲漏水管

通過持續監察和聲音數據記錄儀所發現的滲漏水管，都盡快進行修補。我們也推行新措施，以提高處理水管爆裂事件的效率。



技術人員正為電子儀器進行校正工作。
Staff conducting calibration of electronic instrument.



電磁流量計調校中。
An electromagnetic flowmeter being calibrated.

■ CIVIL WORK

Programmed renovation and maintenance work on our civil structures such as service reservoirs, slopes, access roads, etc. continued.

■ M&E EQUIPMENT

An extensive planned preventive maintenance programme for mechanical and electrical plant and equipment has been developed and implemented to enhance reliability of our water supply systems. During the year, some 58 000 items of mechanical, electrical and instrumentation equipment were maintained or repaired. Condition monitoring and efficiency tests are also carried out to update the priorities of the overhaul and replacement programmes.



技術人員於電機工場內維修一座大型電動機。
A large electric motor being overhauled in Electrical Workshop.

資產管理 ASSET MANAGEMENT

水管爆裂修理個案統計數字 (按供水類別劃分) Statistics on Mains Bursts Repaired (By Types of Water Supply)

由定期合約承辦商修理的水管爆裂個案數目
No. of Mains Bursts Repaired by Term Contractors



風險及危機管理

為使供水服務不會間斷，我們已找出可能危及供水系統的各项風險，並採取積極方法去管理和紓減有關風險。

■ 危機管理計劃

我們試驗和實施了一項危機管理計劃，以加快處理緊急情況和危機。

這項計劃清晰列明應急狀態分級、計劃啟動機制和危機管理架構，確保在遇有系統故障及重大突發事故時，可迅速調動資源並協調各項應急行動。

■ 其他紓緩措施

我們採取的其他紓減風險措施包

括：提高重要水務設施電力供應的可靠程度、改善「監控及資料收集系統」設施、設置保安局制訂的電子布告板系統、改良水務設施的保安圍柵，以及為員工提供處理緊急事故的重點培訓等。

水管爆裂修理個案統計數字 (按運作區劃分)
Statistics on Mains Bursts Repaired (By Regions)

由定期合約承辦商修理的食水管及海水管爆裂個案數目
No. of (F.W. & S.W.) Mains Bursts Repaired by Term Contractors
運作區 Region

財政年度 Financial Year	香港及離島區 (個案數目) HK & I (No.)	新界東區 (個案數目) NTE (No.)	新界西區 (個案數目) NTW (No.)	九龍區 (個案數目) K (No.)	總數 Total (No.)
1993/94	314	103	251	378	1,046
1994/95	243	148	244	359	994
1995/96	334	170	382	429	1,315
1996/97	358	154	451	603	1,566
1997/98	323	168	402	583	1,476
1998/99	394	336	462	758	1,950
1999/00	564	297	429	531	1,821
2000/01	583	306	388	655	1,932
2001/02	545	325	397	617	1,884
2002/03	496	277	319	598	1,690

■ RESERVOIR SAFETY INSPECTION

The number of safety inspections of this year increased by 17 per cent to 1 468. For cost savings, the inspections of 17 impounding reservoirs, 11 irrigation reservoirs and 139 service reservoirs are partly entrusted to consultants.

■ SLOPE SAFETY INSPECTION

The safety inspections of around 6 000 slopes allocated to WSD have been contracted out to consultants. The first cycle of inspections has been completed and the information collected formed a useful basis for prioritizing slope maintenance work.



工作人員正進行斜坡安全檢查。
Staff carrying out slope safety inspection.

資產管理
ASSET MANAGEMENT

測漏統計數字
Statistics on Waste Detection

測漏統計數字 Statistics on Waste Detection									
食水 Fresh Water									
各財政年度所進行的測漏工作 Tests Conducted Per Financial Year	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03
最低晚間流量測試次數 No. of Minimum Night Flow Tests	453	411	396	410	443	495	487	431	334
分段流量測漏次數 No. of Step Tests (or Leakage Tests)	55	72	69	72	77	46	43	15	55
日間流量測試次數 No. of Day Flow Tests	45	65	88	100	124	200	217	223	845
音聽視察次數 No. of Sounding & Visual Inspections	1,502	1,975	3,423	3,545	4,169	4,045	4,438	3,853	3,247
測試及視察次數總計 Total No. of Tests & Inspections	2,055	2,523	3,976	4,127	4,813	4,786	5,185	4,522	4,481
經發現的滲漏個案數目 No. of Leaks Detected	1,847	1,910	2,829	3,287	4,868	5,353	5,714	5,054	3,825
估計每日可節省的水量(立方米) Estimated Quantity of Fresh Water Saved (cu.m/day)	184,278	193,826	209,820	203,998	249,615	254,623	290,940	231,161	178,433
海水 Sea Water									
各財政年度所進行的測漏工作 Tests Conducted Per Financial Year	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03
最低晚間流量測試次數 No. of Minimum Night Flow Tests	9	6	19	23	3	6	5	0	0
分段流量測漏次數 No. of Step Tests (or Leakage Tests)	3	0	1	1	0	0	1	4	11
日間流量測試次數 No. of Day Flow Tests	0	3	4	11	10	20	23	14	31
音聽視察次數 No. of Sounding & Visual Inspections	170	208	177	211	171	284	312	319	376
測試及視察次數總計 Total No. of Tests & Inspections	182	217	201	246	184	310	341	337	418
經發現的滲漏個案數目 No. of Leaks Detected	92	66	127	156	208	216	254	191	197
估計每日可節省的海水量(立方米) Estimated Quantity of Sea Water Saved (cu.m/day)	62,006	10,416	14,511	11,543	23,430	25,532	41,895	25,805	26,993

MAINS BURSTS

The past two years have seen a steady decrease in the number of mains bursts as a result of our active water mains replacement and rehabilitation programme, enhanced preventive maintenance works and trench inspections. There has also been a continued improvement in the time for isolating burst mains and the time for restoring supply interruptions due to streamlining of handling procedures of mains bursts.

LEAKAGE CONTROL

The world-leading technologies in leak detection and the international best practice in leakage management have been adopted to reduce water loss through mains leakage. The leakage management strategy includes:

- **PRESSURE MANAGEMENT**
After the successful trial of 13 small pressure management schemes, work is in progress on the project for extending pressure management to two large supply zones with the use of advanced flow-modulated pressure reducing valves and is scheduled for completion by the end of 2003.
- **PROACTIVE LEAK DETECTION**
Continuous monitoring of water supply network has been stepped up by setting up new district metering areas (DMA) and installation of GSM data loggers in DMAs. Additional noise loggers have also been deployed for

identification of high leakage zones to trim down the leak detection costs.

- **MAINS REPLACEMENT PROGRAMME**

The 20-year mains replacement and rehabilitation programme that began in 2000 is in progress.

- **SPEEDY REPAIR OF LEAKS**

The leaks identified by continuous monitoring and noise loggers are repaired without delay and new measures have been put in place to improve the efficiency in handling mains bursts.

RISK AND CRISIS MANAGEMENT

For the provision of an uninterrupted service, we have identified all possible and potential threats to the integrity of the water supply system and have taken a proactive approach to managing and mitigating these risks.

- **CRISIS MANAGEMENT PLAN**

A crisis management plan has been tested and implemented to speed up response to any emergencies and crises. The Plan sets out clear descriptions of emergency classification, activation mechanism and crisis management structure to ensure rapid mobilization of resources and coordinated action to deal with any system failure and major unexpected events.



技術人員利用聽漏棍找出地下水管滲漏的位置。
Skilled staff using listening stick to detect leaks of underground water mains.



採用水管推頂方法於交通繁忙的道路敷設地下水管。
Using pipe jacking method to lay new water mains under busy road.

- **OTHER MITIGATING MEASURES**
Other risk mitigating measures taken include improving the reliability of power supply to critical installations, upgrading the SCADA control facilities, and setting up the Security Bureau Bulletin Board System, upgrading security fencing of installations, providing staff with focused training on handling emergencies, etc.