

Sichuan Earthquake
Geotechnical Monitoring Equipment Required by the Mainland
for Dealing with Landslide-dammed Lakes

One of the key technical challenges in dealing with the risk of the landslide-dammed lakes (堰塞湖) in Sichuan is to detect the real-time water levels at the lakes, which are at remote locations where physical access is difficult and routine tele-communication is unavailable.

On 22 May 2008, Prof. Chen Zuyu (陳祖煜教授), who is the Head of the Secondary Hazard Group (次生災害組) under the Expert Committee of the State Council Earthquake Disaster Mitigation (國務院抗震救災總指揮部專家委員會), approached the GEO/CEDD for advice on techniques for monitoring the water levels. On the same day, we worked out a scheme for continuous automatic monitoring of the water levels and with satellite data transmission capability, and informed Prof. Chen accordingly. On 23 May 2008, Prof. Chen asked us to explore the possibility of helping them to source the necessary equipment through Hong Kong. He also advised that he had asked agents in the Mainland to compile the monitoring equipment, but it could take some time to produce many sets of equipment given the need to acquire suitable devices and test/calibrate the set-up.

We have approached our points of contact and identified suitable devices and units. These are summarized in the attached Table 1. Item (a) includes integrated units of the monitoring set-up that can be speedily mobilized for installation – 20 units are available and can be delivered to Hong Kong in two weeks. Items (b) and (c) include stand-alone water level sensors and satellite modems, and if made available to the Mainland, will give them the flexibility of building up their own monitoring set-up. Prof. Chen has indicated that they need the integrated units, and he suggested that Hong Kong might consider donating the units and ship them to the Mainland immediately (see copy of his email of 26 May 2008, attached in Annex A).

- 2 -

Table 1 - List of Items for Possible Donation/Loan to the Mainland

Equipment	Possible Use	Order of Cost (Preliminary Estimate Only) *
(a) 20 sets integrated satellite telemetry systems, each comprising a water level sensor, satellite modem and solar power supply	An integrated, off-the-shelf unit suitable for speedy mobilization and installation, with minimal need for performance tuning and testing. Satellite communication and web-based data procession and dissemination services are available.	Cost of equipment (20 sets) = HK\$ 1 Million 3-month data service = HK\$ 1 Million
(b) 20 nos. automatic water level sensors	For continuous monitoring of the water levels at landslide-dammed lakes, to facilitate assessment of the stability of the landslide dams and risk management of dam-break scenario. Similar sensors have been used in Hong Kong for landslide-related monitoring of groundwater levels, and the GEO is familiar with the performance and reliability of the sensors.	Cost of equipment (20 nos.) = HK\$ 0.2 Million
(c) 20 nos. satellite modems #	For transmission of data received from monitoring devises, e.g. water level sensors, installed at remote locations to the existing communication network for onward data processing and dissemination.	Cost of equipment (20 nos.) = HK\$ 0.5 Million

Note:

* The cost estimates are preliminary.

We have just identified that four nos. are currently available in Hong Kong.