

1 December 2002

CDEM ACT NOW IN FORCE

It took awhile but we finally have an Act. The Civil Defence Emergency Management Bill was passed through the House on 8 October, enacted on 17 October, and took effect on 1 December 2002 – the culmination of ten years of review and three years of preparation.

The Minister of Civil Defence Hon. George Hawkins welcomed Parliament's passing of the Bill as a big step forward for developing New Zealand's emergency management capabilities.

"The Civil Defence & Emergency Management Act will ensure that New Zealand has the appropriate structures, expertise and resources to manage disasters at local and national levels. New Zealand needs a modern and focused approach to managing emergencies. This Act provides the basis for that approach. The new Act updates the mechanisms for the coordinated control of people and resources during an emergency and it brings civil defence emergency management into line with changes across government since the Civil Defence Act was enacted in 1983.

"The new approach has been strongly supported by emergency management professionals in the emergency services and local government, and I commend the efforts of those who have already taken positive steps to prepare for the new environment," the Minister said.



**Civil Defence
Emergency Management
Act 2002**

John Norton, Director of the Ministry of Civil Defence & Emergency Management said that the new Act enables a proactive and coordinated risk management approach to all hazards.

"Traditional civil defence focused on response - getting an ambulance to the bottom of the cliff. Along with other key agencies we are now able to focus on all four Rs of risk reduction, readiness, response and recovery.

"Region by region we can now ensure that all the right agencies come together to produce a coordinated civil defence emergency management plan for their region. These plans must be consulted with communities, who will get much better information about their own local hazards, and be able to have a say about the measures proposed to deal with them.

"Our first step in implementing the new framework is informing everyone about it and providing the support needed to get things moving. This framework will enable a far greater engagement at all levels with risk management. And this is a critical component for building resilient communities in New Zealand," Mr Norton said.



**Ministry releases
Mt Ruapehu
lahar risk
assessment
report**



We're on our way!!

On 17 October, the Civil Defence Emergency Management legislation was enacted. Around the country the response has been a positive and pragmatic – “let’s get on with it!”

So, what does it mean?

It is important to recognise it does not just mean a “better” focus on and coordination of civil defence. We could have done that by simply tweaking the 1983 Civil Defence Act.

It is a fundamental change in the basis and accountability for disaster planning and management in New Zealand.

This is best illustrated by looking at the Purposes of the CDEM Act 2002 [Section 3].

- **Promote the sustainable management of hazards.** This means looking at the long-term implications of measures to manage hazards. It requires risk analysis and consequence planning. Flood protection and land use management in New Zealand are examples of this.
- **Enable communities to achieve acceptable levels of risk.** This is the big one. It requires a loss analysis of potential hazard consequences, a decision framework for deciding what risks are acceptable, a commitment to dealing with risks which are unacceptable and a means of communicating these issues to our communities. This is often difficult to deal with where there are competing interests. The Waiho River at Franz Josef is a recent example.
- **Require local authorities to coordinate CDEM planning and activities through regional Groups.** This is the “Civil Defence Plus” and requires planning based on hazard consequences across the elements of reduction, readiness, response and recovery. It defines the lead role of local government in CDEM arrangements and the need to coordinate across regional agencies.

- **Provide for integration of national and local CDEM planning.**

This acknowledges that national capability derives from local capability and each contributes essentially to each other.

- **Encourage coordination across agencies.**

While key individual agencies are required to be capable during and after a disaster this can only be achieved if interdependencies across and between sectors are addressed.

The three primary pre-conditions to achieving the purposes of the Act are:

- the understanding of the hazards and their risk consequences
- the clear accountability for risk management, which rests with individuals and businesses as well as service and governance agencies. This is everybody’s business.
- the absolute need for CDEM agencies to plan and coordinate beyond their individual capability.

As we step up to support the implementation of the Act we have identified two areas of outcome, which will frame our strategic direction over the years 2003-2008. These are reducing risk and creating strong CDEM arrangements in our communities.

During the passage of the Bill through the House, it is interesting to note that every speaker in the debate called for a real focus on the reduction activity. There is also a clear expectation that CDEM arrangements are robust – it is not satisfactory that they be barely adequate.

There is therefore a strong mandate for both outcome areas and we now have the opportunity for delivering on them.

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Act enabling new regional partnerships

The CDEM Act 2002 establishes the legal framework for comprehensive risk management in New Zealand. The establishment of regional CDEM (civil defence emergency management) Groups is a crucial component of the new legislation. Combining resources and expertise within a region provides the opportunity for cooperation and coordination that is likely to make the best use of the available capability.

In this feature, regional CDEM staff comment on where they are at in the process and on finding new tiers of partnership and increased regional coordination.

The Far North

"We're one of the regions that adopted a 'wait and see' approach because we don't have the resources to be pioneers," says Clive Manley, CEO Far North District Council.



Clive Manley

"Obviously however, we've been making provision... For example, we've done work over the past year in prioritising and mitigating risks, and also in working with our communities on response plans – how to create a resilient community, and especially for the more remote parts of the district, how to interact with us effectively.

"We're now going full ahead. We've run a very successful workshop to bring all the key players together (see story on pg

7). In a few weeks, we'll have our process in place for setting up our Coordinating Executive Group and regional CDEM Group itself, and we're currently reviewing what personnel resourcing we need.

"We've always been totally supportive of the direction of the new Act – and especially the process of community consultation, understanding and acceptance of risk management. It won't be a case of me just putting out a plan... I'll literally be sitting down in a marae or hall in our communities and talking through what needs to be done and how to fund it. Each of our communities needs to buy in and walk forward with us.

"My main concern is time. I've always been very concerned about the two-year timeframe. I'm aiming to have tackled our high priority risks in that timeframe, with perhaps a more generic solution for lower priority ones," Mr Manley said.

Auckland

One of four regions involved in a Ministry pilot for the new emergency management environment in 1998, the Auckland region has been preparing for the new environment for over two years, says Craig Shearer, Auckland Regional Council's Director of Strategic Policy.

"In fact we've been operating as if already under the new legislation for some time, under delegated authority from the Auckland Regional Council."

Among programmes already in place to give effect to the new Act are development work on the region's Emergency Management

Plan, professional development for key staff, consolidation of the region's emergency operations centres from eight to four, efforts to ensure consistency in their systems and terminology, regional exercises, and the 'Plan B' community education programme.

"We already have cooperation across the region in terms of all territorial authorities working together," says Mr Shearer.

Early results of these efforts include the realisation that in a major event under the old civil defence arrangements, all local authorities would have been trying to access the same equipment from the same companies.

"We've definitely already achieved better targeting of threats, and also better integration of risk management arrangements."

"Targets for the six months ahead include on-going development of the region's CDEM Plan, establishing new committees based squarely on the final wording of the Act, and putting in place the new emergency management hierarchy.

"We'll be looking to consolidate where we are now, and extending civil defence into the broader structure of council operations. We've gone far enough to know that the new structure will deliver better, and more integrated outcomes.

"The ARC and Auckland territorial local authorities (TLAs) have jointly prioritised the regions' hazards, using a model into which we incorporated information on risk seriousness, manageability, urgency and the potential impact of the region's growth. Top hazard priorities are infrastructure failure, followed by volcanic eruption and earthquake, although clearly events could change these priorities," Mr Shearer said.

Gisborne

Gisborne District Council "has no one to argue with except ourselves". Joking aside, CDO Richard Steele believes that despite covering the North Island's largest district, being a unitary authority can be helpful in streamlining decision-making.

Gisborne District Council started preparing for the new environment last year, by moving to form the required group. "We've also been working on the strategic component of the new CDEM Group Plan, and have completed assessment and prioritization of hazards."

Initial public consultations on the strategic component of the draft Plan will begin in February next year with completion by June. "This is to ensure we get feedback early, rather than later in the process as this bit of the Plan is basically the 'new' bit.

"What's ahead is a continuation of that process and the formal formation of our CDEM Group on 23 May 2003 with a constitution signing party.

"We have already found that this process is enhancing local arrangements between the council, lifeline utilities and emergency service operators. The requirement to plan and consult together is bringing about greater integration and



Craig Shearer



proactivity. And now the Act has been passed, there are no more excuses for not doing so," says Mr Steele.

Taranaki region

One of the regions involved in the Ministry pilot programme, Taranaki Regional Council saw its advantages and has been setting up the structures and planning in preparation, according to Bev Raine, Senior Emergency Management Officer.

"Work over the next few months will focus on formally constituting the informal groups that have been operating, and the disestablishment of the regional civil defence committee which will be replaced by a joint standing committee as per the new Act.

"The Taranaki region has worked together over the past 13 years with an excellent blend of cooperation and goodwill and because of this we've anticipated the changes required. We ensured that all of our districts and the regional council had up to date civil defence plans, so that in the transitional period, while we were working on the CDEM Group plan we had good cover."

Ms Raine says that work has commenced on the CDEM Group plan and in particular, the new Act's requirements for an "all hazards" approach. Prioritising potential threats such as war, terrorism, civil disobedience, biological threats and so on, is "an interesting challenge".

She expects that the building blocks for the CDEM Group plan will be in place and presented to the first CDEM Group meeting in March 2003.

Manawatu

"The planning process itself has been invaluable in terms of developing partnerships," says Ged Shirley, Manager Emergency Management Office, Horizons Manawatu.

While the draft CDEM Plan is viewed as a roadmap for managing risk in the region, and a foundation for further improvement, "the level of trust and teamwork we've developed through our local authorities, emergency services, hospitals, and agencies such as Ministry of Agriculture and Forestry, Red Cross and so on, has been really useful. These are allowing us to create economies of scale, because we can bring different skill sets and experience to various projects and initiatives which have mutual benefit."

In 1999, the region decided to form an Emergency Management Group with a Governance Body consisting of the mayors of the seven district councils plus horizons.mw, and a Coordinating Executive Group of CEOs' representatives from the local authorities, utilities and district health boards. Early in 2001, planning commenced to produce a CDEM Group Plan in accordance with best practice guidelines at the time provided by the Ministry.

"The Draft Plan is now complete, has been publicly consulted on, and a draft sent to the Ministry for comment, prior to a final copy going to the CDEM Committee to approve for comment by the Minister. This draft CDEM Plan is already proving invaluable, because it provides the basis for a coordinated approach to addressing commonly agreed regional issues, and also represents the needs of agencies such as the emergency services, as well as local government.

"While writing the plan, we recognized that some of the objectives that had been developed to address our issues needed to start immediately. It also became clear that we needed to do a lot more work with our risk analysis."

As a result, a lifelines project was initiated, based on models already implemented by other regions, because, "we didn't adequately understand the technological risk arising from utility failure. The lifelines project has provided the impetus for doing more GIS work, and also created another tier of partnerships that we didn't have before.

"Other work to date includes improvement of regional communications networks, and a very successful CDEM Group programme implementing CIMS level 2 and 4 training throughout the region. The CIMS project is a good example of what can be achieved with good partnerships. In our case, the Regional Council contributes the direct costs for administration, while everyone else contributes time, and staff to a multi-agency training team that delivers courses for no cost throughout the Districts," Mr Shirley said.

Wellington Region

For Rian van Schalkwyk, Wellington Regional Council's Manager of Emergency Management, the new Act is "all about working together better".

In Wellington Region, the regional CDEM Group will be administered by the Wellington Regional Council, and run as required as a joint standing committee comprising the Mayor or another elected representative from each of the region's nine territorial authorities: the Wellington Regional Council, the four city councils - of Wellington, Upper Hutt, Porirua and Hutt City, plus the four district councils - of Kapiti, Masterton, Carterton and South Wairarapa.

"Chief Executives from these territorial authorities met on 12 November, agreeing to form a working party to sort out terms of reference and a constitution to formally establish the CDEM Group, to meet again on 10 December, and to review the draft establishment documents early next year, at which point representatives from other agencies would be invited to join.

"We need to form the CDEM Group before 1 June, 2003, and we're on track to do that. Once established, the Group will set up a regional Civil Defence and Emergency Management Office, and one or more emergency operations centres, then appoint a Group Controller to be in charge of the whole thing, and also appoint local controllers as required."

The second key group required under the Act, the Coordinating Executive Group (CEG), will comprise the chief executives of the territorial authorities, with senior representatives from Police, Fire, district health boards, lifeline utilities (water, electricity, gas, telecommunications, ports, etc.) and others invited by the group. An informal CEG workshop has been held in the region, endorsing the group concept and commencing the formation process.

Since the early 1990s, the Wellington Regional Council has been working with local authorities on hazard analysis for the region, focusing on natural hazards such as earthquake, wild fire, tsunami, slips and slides, and flood protection.

"We've also looked at risks such as the storage and transport of petroleum products, and are currently considering climate change and meteorological hazards.

"While we already have a lot of information available, the 'all hazards' approach in the new Act requires that we are very



Rian Van Schalkwyk



systematic in identifying all hazards, looking at their possible consequences, and saying what are we going to do to manage them."

"All of us need to work together: regional, city and district councils, emergency services, district health boards, volunteer networks...It's all about integrated emergency management. With a joint plan leading to coordinated emergency management arrangements in the region, we'll all have one songsheet to operate from."

Mr Van Schalkwyk believes that a further potential advantage of agencies working more closely is the ability to cooperate to make better use of their people's skills in the region.

The West Coast

New Zealand's fifth largest region is also its most sparsely populated – posing special emergency management issues that the new Act will help address, says West Coast Regional Council Civil Defence Officer Vijay Narayanan.

"Act requirements such as including engineering lifelines input, and senior managers from the region's emergency services in the CDEM Group, have a lot of merit in terms of improving integration and coordination of emergency management across the region.

"Having constituted a Civil Defence Group for the region in July 2001, chaired by West Coast Regional Council CEO Terry Day, this group will form the basis of the region's CDEM Group to be formalised as a standing committee of West Coast Regional Council in about six months," says Mr Narayanan.

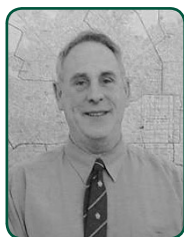
In anticipation of the Act, a number of regional committees have been convened to interface with the CDEM Group, and meetings held. These include formation of an Emergency Services Coordinating Committee chaired by Police, and a Hazardous Substances Technical Liaison Committee headed by the Fire Service. Two Coordinated Incident Management Systems training sessions and two engineering lifelines meetings have also been run.

Canterbury Region

Environment Canterbury's Regional Civil Defence Manager, John Fisher, is a strong advocate of the direction of the new legislation.

"We certainly support the track the new Act is taking us down. A much wider variety of people are talking together and there is an expectation that the organisations involved will consult each other more often. We're already starting to see that the result of this process will be a far more resilient community."

John Fisher's team has been working with a trial CDEM Group since May 2000. The trial group has used the Canterbury Forum, a three-monthly meeting of the mayors and council chief executives throughout the region, as a governance body, while the Environment Canterbury Civil Defence Office has been acting as the emergency management office for the trial group.



John Fisher

"Something that has worked particularly well is extending the trial group beyond what is required under the new legislation to include representatives from agriculture and business. This has ensured there are contacts into a wider range



From Left to Right: Vijay Narayanan - CDO WCRC, Wayne Moen - Alternate Controller WCRC, Doug Truman - Regional Controller West Coast, Sgt Laurie Anderson - NZ Police at a recent Controllers' workshop.

of sectors in the community, which we believe will ultimately improve our resilience," Mr Fisher said.

More specialised work for the new environment has been undertaken by a number of working parties: one each for public information and education, Risk Reduction, Readiness and Response, and Recovery. These are all coordinated by a Strategy Working Party, comprising all the chairs of the working parties and the chairman of the Coordinating Executive Group.

To date, eight of Canterbury's 11 local authorities have agreed in principle to a draft constitution to formally set up the region's new CDEM Group. It is expected the new group will be finally set up by April/May 2003.

Southland

Individual groups have given "a fair bit of thought" to how civil defence and emergency management should be structured in the region, Environment Southland Hazard Mitigation Planner Dallas Bradley says.

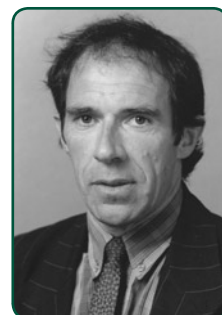
Chief executives of all four of the region's local authorities met in mid-November to identify the tasks and timelines ahead.

"I believe we're in a really comfortable position to make the transition. All councils are well-informed, and already have very close working relationships at both staff and political levels.

"Strong relationships have been developed with the Emergency Services and Otago counterparts through the activities of formal liaison groups and the Otago Southland Emergency Planning Group.

"The recent development of the Fiordland/Coastal Passenger Ship Emergency Response Plan and the use of the Invercargill City Council's EOC by Environment Southland and the Maritime Safety Authority in response to the Tai Ping grounding are testimony to the strength of those relationships," says Mr Bradley.

"With the current cooperative collaborative environment, the establishment of the CDEM Group and the Coordinating Executive Group should be a formality. The challenge will lie in the operational and functional arrangements of the future," he said.



Dallas Bradley



CDEM Act 2002 – Transitional Arrangements

By Richard O'Reilly, Senior Policy Analyst

While the Civil Defence Emergency Management Act 2002 has now formally commenced life as an Act, it is still, in legislative terms, just a babe in arms. It will be a couple of years before the CDEM Act becomes a fully functioning legislative mechanism utilising all of its 100+ provisions.

In the meantime, the old Civil Defence Act of 1983, having only just turned 19, will now retire from active duty and take up a baby-sitting role until the CDEM Act and all the Groups it establishes are ready to survive by themselves. So, don't think that you can throw out your tattered old copy of the 1983 Act just yet. There is still a bit of life left in the old legislation. In fact the 1983 Act will probably be around just long enough to celebrate 21 years in December 2004, before it finally gives up the ghost.

Right, enough of the birth, life, and death analogies, what does all this mean in reality. On 1 December 2002 the Civil Defence Act 1983 was repealed and the Civil Defence Emergency Management Act 2002 came into force. The detail of what that all means is on the CDEM Act 2002 page on our website (www.civildefence.govt.nz). The principal timings that the new Act introduces are:

- All CDEM Groups must be formed within six months of the commencement of the Act – by 1 June 2003.
- A National CDEM Strategy is to be issued within 12 months of commencement – by 1 December 2003.
- CDEM Group Plans (which replace existing CD plans) must be written within 2 years of the group formation.
- A National CDEM Plan (to replace the National Civil Defence Plan) must be written within three years of commencement by – 1 December 2005.

It is critical that there are appropriate arrangements to cater for civil defence activity in the interim period, i.e. while CDEM Groups are being formed and CDEM Group Plans and the National CDEM Plan are being developed. This job falls to the last four

sections of the CDEM Act 2002 (ss118-121) which are known as the transitional provisions. Essentially these provisions are designed to ensure there is a smooth transition from the systems, structures and processes mandated by the 1983 Act to the different systems, structures and processes that are required by the 2002 Act. In practice, the transitional provisions allow for a gradual shift to a new system. The provisions keep existing plans and procedures in place until new ones (based on the purposes and principles underpinning the new CDEM environment) can be developed, rather than throwing everything out and starting from scratch.

Councils may maintain their current Civil Defence arrangements, including being able to declare and manage a Civil Defence emergency, until ready to implement new arrangements. Existing arrangements remain in effect until territorial authorities and regional councils' first Civil Defence Emergency Management Group Plans become operative.

All civil defence plans in force as at 30 November 2002 continue in force until the first appropriate (i.e. National or Group) Civil Defence Emergency Management Plan becomes operative. Existing local authority civil defence plans can be reviewed and changed in the interim if necessary (for example when a controller is replaced). The National Civil Defence Plan cannot be amended and has been recently revised to ensure its currency.

The CDEM Act 2002 provides that all references in current documents to the Director of Civil Defence, a Civil Defence Commissioner, the National Civil Defence Committee or a Planning committee should be read as a reference to the Director of Civil Defence Emergency Management. Similarly, once a CDEM Group has approved their first Group Plan, any existing documents that make reference to civil defence personnel and entities are to be taken as the equivalent reference using the appropriate CDEM Act 2002 terminology.

There are bound to be questions and issues that arise as we go through the transition process. If you have any queries please contact us.

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The Origins of the CDEM Act 2002

By Blair Robertson, Policy Analyst

Civil defence and emergency management has a long and rich history in New Zealand. The original function of civil defence arose during World War II and was to protect the public in the event of war making its way onto New Zealand soil. In 1953, local authorities were given additional functions and powers to respond to earthquakes, fires, floods and other natural as well as war-like threats. This subsequently became the basis of the Civil Defence Act 1962.

The nation's system for managing emergencies has, until now, remained relatively unchanged since its inception in the 1950s.

During this era, New Zealand had primitive telecommunications, transport networks and modes of transport compared to other parts of the western world. The initial rationale that every community needed an autonomous civil defence headquarters to direct a response was evidence of the relative isolation of many towns and cities in New Zealand. In turn, the Civil Defence Act 1983 aimed to enhance the performance of local authorities in dealing with emergencies and civil defence. Its focus very much remained on the response and recovery of communities to emergencies.

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The Origins of the CDEM Act 2002

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A Time For Change

In the early 1990s, a series of reviews and reports recommended changes to New Zealand's emergency services and civil defence. In 1991 the Law Commission released its "Final Report on Emergencies" which among other things recommended a review of the Civil Defence Act 1983. In 1992 the Civil Defence Review Panel concluded existing structures could not cope with major emergencies. After this review, Cabinet approved implementation of changes not requiring legislation or new resources. In the same year, local authorities reached agreement with the Ministry of Civil Defence in the Arahina Accord, on the basis for new legislation. The agreement included adoption of an "all hazards approach", triennial evaluation of civil defence organisations and setting of national training standards.

In April 1995, the government appointed the Emergency Services Review Task Force. The Task Force identified the need for change arising from three key factors:

- An over-inflated public expectation of the government's ability to respond in the event of a major emergency.

- A diminished capacity of central and local government to respond to an emergency because of state sector reform, which had reduced the resources directly available for an emergency response, for example, those resources previously provided by the former Ministry of Works and Development.
- The ability of emergency services to adapt to changing circumstances, in particular the increasing range of man-made hazards created by the processes of urbanisation and industrialisation.

In light of these problems and of international trends, the Task Force recommended the adoption of a comprehensive and integrated risk management system. They also endorsed the formation of Emergency Management Groups, an "all hazards" approach to emergency management, a need for better technical information and expertise, and the principle of individual and community responsibility and self-reliance.

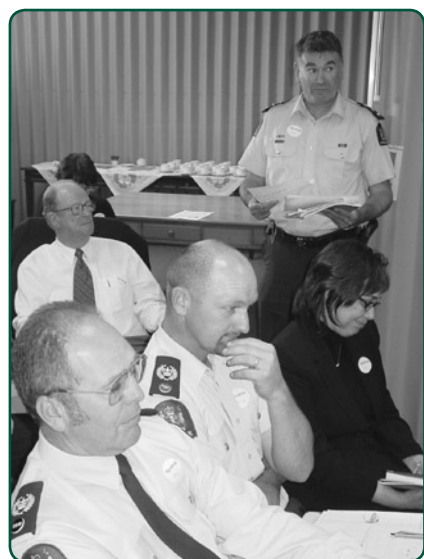
The Civil Defence Emergency Management (CDEM) Bill was introduced to Parliament in November 2000. The CDEM Bill was referred to select committee on 12 December 2000. The committee received and considered 80 submissions from interested groups and individuals. The CDEM Bill was passed and enacted in October 2002. The CDEM Act 2002 came into force on 1 December 2002. ■

Northland Workshop

By Graeme MacDonald, Northland Regional Council

The Northland region's ability to cope with natural disasters and other emergencies has moved up a notch after a very successful Professional Development workshop in Whangarei on 9 Oct.

The meeting brought together more than 50 participants representing agencies from across the entire spectrum of emergency management in Northland and was the first of its kind held in the region.



Members participating in a group situation during the recent Northland region professional development initiative.

Held at the Northland Regional Council offices in Whangarei - coincidentally the day after the new Civil Defence Emergency Management Act passed through Parliament - the meeting has been hailed a success and the start of a "new era" in local emergency management by both participants and organisers alike.

Among the myriad of groups represented were emergency services and essential

utilities staff, welfare groups and support agencies. Additionally, CEOs from three of the region's four local authorities attended (the fourth was overseas) as well as national representatives from the Ministry of Civil Defence and Emergency Management.

The day covered issues including effective emergency management, the importance of working collectively, and relationship building.



Left: Chris Webb, Professional Development Manager, MCDEM and Graeme MacDonald, Emergency Management Officer, NRC

It was the first time all these people had sat together in one room and talked about all those issues in Northland. The gathering identified some "gaps" in terms of overlap in functions as well as revealing some groups were not entirely sure what was expected of them under the new Act. As a result, initiatives to resolve the issues which had been highlighted are already underway.

Further meetings are likely to be held, albeit on a smaller scale and with a focus more specific to some of the players involved. The Professional Development workshop was developed by the Northland Regional Council and Ministry of Civil Defence and Emergency Management at the Ministry's suggestion.

Waiho River Flooding Risk Assessment

A report released by the Ministry of Civil Defence & Emergency Management in October 02 quantifies for the first time the serious risk to life from flooding of the holiday park area of Franz Josef. The area on the south bank of the Waiho River is on the South Island's West Coast.

Background

The bed of the Waiho River adjacent to the Franz Josef Glacier township is aggrading and is now higher than the surrounding ground level. Since the 1940's, the bed level in the vicinity of the SH6 bridge has increased approximately 10 metres. The river is constrained to its present alignment by the flood defences constructed along this reach to protect the motels and holiday park on the adjacent floodplain. At some point, a flood event will occur on the Waiho River that will breach the flood defences and inundate parts of the surrounding area.

Concerned at the risk, the Ministry engaged Optimx consultants to investigate the risk to life posed by flood events on the Waiho River to people in the Holiday Park area immediately to the south of the River adjacent to the SH6 bridge, and to assist in the evaluation of proposed risk reduction and response mechanisms. The *Waiho River Flooding Risk Assessment* report presents the results of the investigation which was undertaken in August 02.

The assessment considers the nature of the flood scenarios likely to occur on the Waiho River, the risk to assets and people in the Holiday Park area, and the effectiveness of the existing warning and response procedures.

Conclusions are drawn as to the likely risk to people in the Holiday Park area with the current systems in place, and recommendations made regarding areas where possible improvements in the warning and response systems may be achieved.

The purpose of the study was to bring together the work that has been done in the past on the hazards associated with the Waiho River and develop a measure of the risk to life associated with these hazards.

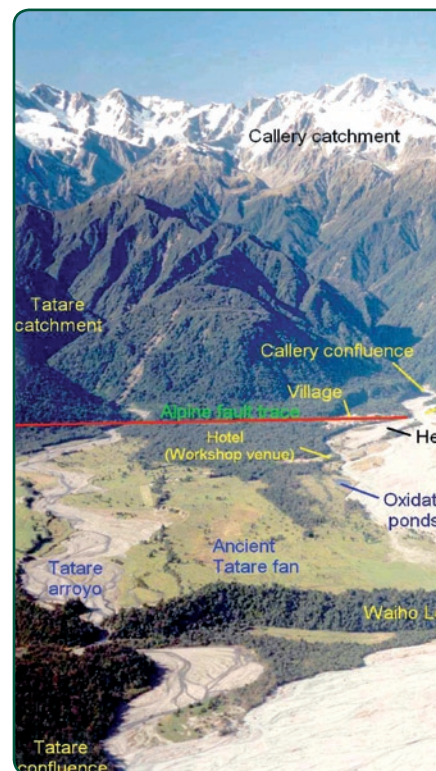
Summary of report conclusions

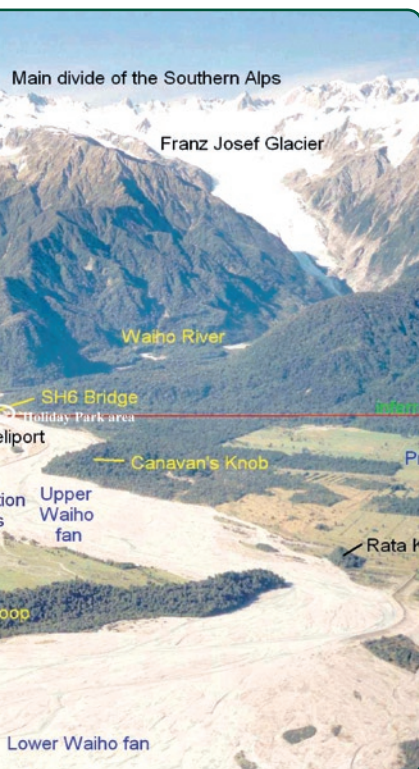
1. Flood hazards on the Waiho River can be grouped into two broad categories: "normal" rainfall related floods, and floods associated with landslide-dambreak events in the Callery Gorge.



View from the north bank of the holiday park stopbank, with the top floor of the motel visible on the left, and in the middle of the picture, the roofs of other buildings are below the height of the stopbank.

2. The flood defences in the vicinity of the Holiday Park area are at high risk of failure in a flood event on the Waiho River.
3. The Holiday Park area is likely to be extensively damaged in a "normal" flood if the flood defences fail, and completely destroyed in a dambreak event regardless of the presence of the flood defences.
4. Any persons caught in the path of a flood through the Holiday Park area are likely to be killed in a "normal" flood, and extremely likely to be killed in a dambreak event.
5. The expected number of people that may be exposed to the flooding hazard in the Holiday Park area at any time is highly variable. It ranges from 20 to 26 during the day, up to 130 to 190 at night, depending on the time of year. The maximum number of people in the Holiday Park area is approximately 300, assuming every bed is full and all staff are on site.
6. The annual risk of fatalities in the Holiday Park area varies across the different types of floods and different numbers of people exposed to the hazard, but is generally in the order of 0.4% to 6%, if there is no warning or response system in place.
7. The existing warning and response plan has some limitations, but does reduce the risk of fatalities, primarily for "normal" floods and landslide-dambreak events that occur in fine weather. For landslide-dambreak events that occur during a storm, the existing warning and response plan is ineffective and does not significantly reduce the level of risk.
8. The annual risk of fatalities in the Holiday Park area varies across the different types of floods and different numbers of people exposed to the hazard, but is generally in the order of 0.2% to 2%, allowing for the existing warning and response systems.
9. The risk to life in the Holiday Park area is greatest for the "normal" flood events and the rainfall-triggered landslide-dambreak events. These events should therefore be the primary, but not exclusive, focus of any risk mitigation efforts.
10. Acceptable levels of societal risk for the likely numbers of fatalities in the Holiday Park area are in the order of 1 to 100,000 to 1 in 1,000,000 (0.000001 to 0.0001). These limits are substantially lower than the current level of risk, and are unlikely to be met through warning and response system improvements alone.





11. The only practical, long-term solution to reduce the risk of fatalities to an acceptable level appears to be through relocating the motel complexes with subsequent changes in the zoning of the Holiday Park area to prevent future redevelopment.

Regardless of what is done with the Holiday Park area, there will be an ongoing need to monitor the safety of the SH6 bridge during flood events on the Waiho River.

The report also identifies possible areas for improvement in the existing warning and response procedures. These include:

- Increasing the robustness of the

response procedures.

- Investigating ways to reduce time required for evacuation
- Investigating the feasibility and safety of an alternative evacuation option
- Clearly stating the need to immediately evacuate the motel complexes after an earthquake until the risk of a landslide-dambreak flood has been eliminated.
- Investigating the feasibility of establishing a monitoring system for detecting changes in water levels in the Callery River to detect flow changes associated with a landslide dam.
- Investigating the feasibility of establishing a local seismograph network to detect landslide activity in the surrounding valleys.



Maintenance work on the SH6 bridge



Erosion of the floodbank on the south side of the Waiho River just downstream of the holiday park area.

Civil Defence issues hazard warning for Waiho area

A hazard warning was issued on 18 October by the Director of Civil Defence for the area near the Franz Josef township. The area affected covers part of the south bank of the Waiho River on the South Island's West Coast, and includes the Franz Josef holiday park area. It does not include the main Franz Josef township.

Civil Defence Minister George Hawkins and Environment Minister Marian Hobbs supported the action after receiving a report to the Ministry of Civil Defence and Emergency Management showing a serious level of risk to life in the event of flooding in that area.

Following the report, the government had decided immediate action was necessary to prevent any risk to life, the ministers said.

"Given that in heavy rain, the report states a landslide could occur within as little as one to two hours, it is important that people be warned of the risk," George Hawkins said.

The ministers met with a number of affected parties on 17 October, including landowners and businesses, as well as representatives from the local regional and district councils to discuss possible action, including relocation of at-risk businesses and property concerned.

Marian Hobbs said the government had made a commitment to work with the local community and the affected businesses and residences to reach a safe solution.

continued on page 10



Flood defences on the true left bank that provide protection to the holiday park area – the raised glacier access road and rock groynes upstream of SH6

Waiho River Flooding Risk Assessment

continued from page 9

Agreement reached on Waiho River safety issue

On 25 Oct, the Director of Civil Defence Emergency Management announced that an agreement has been reached with the accommodation operators on the south bank of the Waiho River.



Looking upstream towards the confluence of the Waiho and the Callery rivers in a moderate flood event.

DIRECTOR'S GUIDELINES

CDEM Groups represent a unique opportunity to improve relationships and coordinate hazard management arrangements for the benefit of public safety. Development of CDEM Group Plans logically builds upon and improves existing civil defence planning by adding a risk management approach to addressing hazards. Whilst various policies, plans and procedures exist across local government and emergency services, there is no integrated planning that addresses all hazards in a coordinated, multi-agency manner.

As with any change process, there are a lot of issues to overcome as CDEM Groups form and plan together and given the enabling nature of the new legislation, there are a variety of solutions. Local government, emergency services, lifeline representatives and Ministry staff have produced a set of 'Director's Guidelines' to assist CDEM Group formation, planning and lifeline utility interaction:

Working Together: The Formation of CDEM Groups
(Director's Guideline DGL 1/02)

Working Together: Developing a CDEM Group Plan
(Director's Guideline DGL 2/02)

Working Together: Lifeline Utilities & Emergency Management
(Director's Guideline DGL 3/02)

These are available from your regional Ministry staff, on the Ministry's website at

www.civildefence.govt.nz

under the Publications and Documents section or email
emergency.management@dia.govt.nz

The Director, John Norton, said that an Enhanced Waiho River Response Plan which has been developed by the Westland District Council will allow the accommodation operators to safely continue to occupy the area for a period of six months to the end of April 2003, while they effect an orderly relocation of their businesses.

"The response plan, which is an outcome of the meeting with Ministers, central and local government officials, the accommodation operators and landowners on 17 October, has the agreement of all the key parties, and will be administered by the Westland District Council."

"This is an excellent outcome and was achieved with the cooperation of all the parties involved. It is clearly understood by all parties that the enhanced response plan is impracticable long term, and that on 1 May 2003 the civil defence hazard warning signs will be erected," said Mr Norton.

Mr Norton said that discussions continue with the parties on assistance with the relocation.

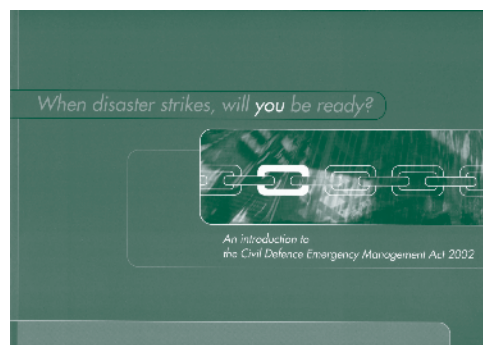
The enhanced response plan builds on the existing Westland District Council Franz Josef Civil Defence Response Plan. The enhanced plan involves detailed monitoring of the Callery Gorge outlet and includes the following elements:

- Daily onsite observation of the Callery Gorge outlet – looking for unusual flow conditions. This covers the low river flow event for which up to 60 hours warning is available
- On agreed trigger points, the Callery River will be continuously monitored by onsite observation 24 hours a day until normal river conditions return. The trigger points include: unusual observation of the Callery Gorge/River: heavy rain warning; Callery not observable due to mist/rain; heavy rain occurring; and the Waiho River rising

This covers the possibility of the sudden high riverflow dam break type event.

- On preset alert levels the south bank of the Waiho River will be evacuated. ■

Introduction to the CDEM Act 2002



The Ministry has developed a brochure on the new CDEM Act 2002 to provide information on the key elements of the new legislation, and how it affects local and central government, emergency services and utilities.

The brochure, and a series of fact sheets are available on the Ministry website

www.civildefence.govt.nz

If you would like hard copies of the brochure to raise awareness of the new civil defence emergency management legislation within your organisation, please email:

emergency.management@dia.govt.nz

Emergency Management Library

By Sara Williams, Project Coordinator

The Emergency Management Library is a specialist collection of reference books, journals, videos, tapes and other materials held by the Ministry of Civil Defence and Emergency Management. The Emergency Management collection is housed in the New Zealand Police College Library in Porirua, and is open for use to members of the civil defence emergency management and related sectors.

What we have

The collection is targeted at individuals working in the emergency management sector nationwide, and provides access to current literature and research. The materials in the library are added to frequently, with journal articles, items and documents from the internet, research papers and thesis all considered for the collection. The recent purchase of the Emerald Database has also given the library an on-line journal referencing and review capability, providing full-text access to over 215 journal titles.

The Ministry also holds hard copies of journals such as Risk and Decision Policy, Journal of Contingencies and Crisis Management, and Natural Hazards Observer. The recently re-established links with Emergency Management Australia have also increased our access to resource and journal holdings. Plans for further development include the addition of an Urban Search and Rescue section, and a Public Education section to be available early in the new year.

Using the library

Use of the library is available (either online, through research requests, or by visiting) to authorised users at no charge. Access to agencies is restricted but can be arranged. For either application, please contact Tom Roche, Sara Williams or Chris Webb at the Ministry on (04) 473 7363 or email emergency.management@dia.govt.nz.

Once access is arranged, the user can pass requests on to the library staff, who are always ready to help with inquiries and research needs. Librarians can search for documents, articles, and text or on-line resources for users, and send items out to regional areas. The borrowing system operates as a standard library (including overdue notices!).



The three M's: (left to right) Maria Andre, Maureen Woodcock and Margaret Vine

Our wonderful librarians

Maria Andre, Maureen Woodcock and Margaret Vine are the highly professional and respected team that run the Police Library and are responsible for the Emergency Management Collection. Margaret, who admits to a life-long fascination with sleuthing, loves the diversity of reference work and the satisfaction of providing users with the information they need. Maureen has always been a book lover, depriving herself of reading for many years due to an inability to put a book down. Now she uses the skills developed over years of research genealogy to provide information for library users. Maria manages the team, and oversees the changing demands of users and the information environment. All are highly skilled and with qualifications in their areas of expertise the three M's, as they are known, are an invaluable resource to the Ministry and wider sector.

Resources needed

To keep the collection up-to-date and comprehensive we welcome any CDEM related publications or reports from the sector. Such items as research reports, guidelines and plans are useful holdings for the library, and are used by students, researchers and sector personnel. If you have any items that you believe would be a useful holding for the library please forward to Sara Williams at the Ministry, PO Box 5010, Wellington.

Professional Development – Regional Initiatives

By chris.webb@dia.govt.nz
tom.roche@dia.govt.nz

The Ministry's Professional Development unit, along with other Ministry staff have been fully involved in supporting and assisting in regional professional development initiatives. These initiatives arose from the professional development questionnaire sent out to all Civil Defence Officers at the end of 2001. The results of the questionnaire identified regions where professional development initiatives were going to occur and where support and assistance from the Ministry would be welcomed. The region administers these initiatives but collectively the region and the Ministry finalise the programme and identify areas where Ministry assistance and support can be provided.

Outlined below is a list of recent and upcoming regional initiatives.

October South Island Recovery Managers forum
Northland Region – establishing closer working

relationships
Canterbury Region – Controllers Forum

November West Coast Region – Controllers Forum and
establishing closer working relationships
Hawkes Bay – Controllers Forum

December Southland – Controllers forum

February/ Otago – Wardens and Controllers Forum
March '03 Thames Valley Combined – Controllers Forum
(specific Manawatu/Wanganui – Recovery Managers
dates tbc)

These regional initiatives, along with the nationally directed courses (February – May) mean that throughout the year clearly targeted professional development is occurring. The questionnaire asking regions/local areas to respond to professional development initiatives where Ministry support and assistance would be welcome will be sent out shortly.

Updates will be posted on the Ministry website -
www.civildefence.govt.nz.

Public Safety and Risk Management Workshop

**By Chris Webb,
Professional Development
Unit**

As part of their strategic planning the Disaster Management Unit of the South Pacific Applied Geosciences Commission (SOPAC) held a Public Safety and Risk Management sub regional workshop in Samoa from 19 – 23 Aug 2002.

The aim of the workshop was to strengthen public safety and risk management practices in Pacific. Thirty one (31) participants covering a range of organisations from Samoa and Tokelau attended the workshop, which was fully supported by the Government of Samoa.

SOPAC sought the assistance of the Ministry of Civil Defence & Emergency Management for the workshop. Chris Webb, Professional Development Manager with the Ministry facilitated the workshop, while Simon Chambers, Emergency Management Planner, led the sessions on risk management. Other speakers from Emergency Management Australia and SOPAC also made presentations. The workshop covered a number of areas including:

- International Disaster Reduction Developments
- CHARM Risk Management Process
- Applying Risk Management Planning Principles and Concepts



Emergency Management Planner Simon Chambers going through the planning concepts in the risk management session.

- Developing Effective Groups
- Communication Principles
- Current Situation in Samoa and Tokelau
- Disaster Risk Management Issues facing Samoa and Tokelau

At the conclusion of the workshop, the participants developed a number of recommendations that they believed would assist both Samoa and Tokelau progress towards adopting a risk management approach to disaster reduction.

Exercise Swansong

By Bill Morley, Waitakere City Council

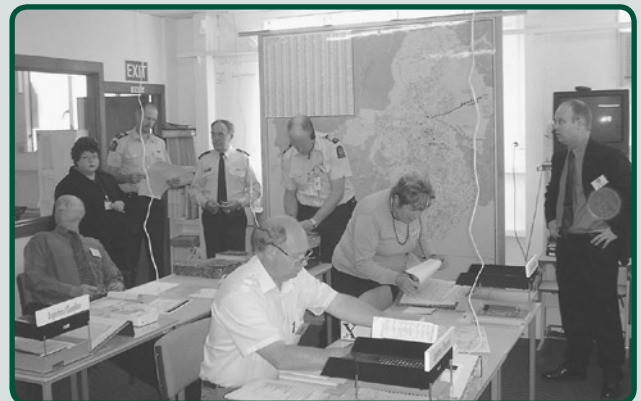
A major hazardous substances event featuring fuel leaking from an overturned petrol tanker and a mixture of nasty chemicals caused chaos in Auckland's Waitakere District during a recent EOC activation and response exercise.

Several schools, the Waitakere Hospital and the council offices were closed, and thousands of people including over 3000 school children had to be evacuated.

These were just a few of the considerations that council and emergency services staff had to face during this year's civil defence exercise held at the Waitakere City's Civil Defence Emergency Operating Centre on 18 October.

Exercise Swansong (so named to mark the impending retirement of long serving CD Emergency Services Manager Heather Smith) involved over fifty council staff, members of the emergency services and civil defence volunteers. The exercise was conducted in three shifts and over a nine hour period. It was designed to exercise the Council's civil defence response organisation and the procedures required when working in an activated civil defence headquarters.

Emergency Services Manager Heather Smith was thrilled with the outcome of the exercise.



EOC Staff prepare a briefing while Heather Smith (second from right) assists. Alt Controller Ross McLeod at right looks on

"Like any exercise there were lessons learned but once again our organisation was able to respond and operate effectively in an activated HQ scenario in an effective manner. It is particularly pleasing to have so many council staff trained for this type of activity," said Heather.

Note: For those of you who were not at this year's Director's Forum, Heather Smith retires from her position as the Manager Emergency Services Waitakere City in December and I'm sure you will join in with wishing her every best wish for her retirement.

A National Crisis Management Information System

**By Mike O'Leary,
Manager Readiness**

A proposed electronic National Crisis Management Information System (NCMIS) will improve the effectiveness of local, regional and national emergency management through the collection, rapid evaluation, and easy dissemination of information.

The Ministry of Civil Defence & Emergency Management has recently completed the process of determining the business requirements, and technical and functional specifications of a NCMIS. The proposed system would be operated by frontline emergency operations centres and would greatly aid the management of emergencies. The system would enable the rapid assimilation and reporting of information within emergency operations centres and onward to civil defence emergency management (CDEM) Groups and the National Emergency Operations Centre (NEOC) in Wellington.

The proposed new system is aimed at having in place a management information system which will be robust enough to service a major disaster. GIS (Geographic Information Systems) technology is a requirement of the system as it allows information to be recorded on electronic maps, which can be instantly updated, viewed and transmitted.

Seven IT firms were invited to tender for the development of the requirements and specifications for the system this year. Wellington-based consultants Working Knowledge were awarded the tender.

District and regional requirements

In August, work commenced on the development of the requirements with a series of focus group meetings attended by district and regional emergency responders. Existing documentation was also extensively reviewed.

The focus group meetings that were held in the north and south island were attended by representatives from district and regional councils, and from metropolitan and rural areas. The participants were: Ged Shirley, Euan Robertson -horizons mw; Rian van Schalkwyk -Wellington; Marshall Hyland -Porirua; Kevin Potroz -Hawkes Bay; Fred Wilson - Auckland; Ron White-Thames

Coromandel; Ian Fraser - Wanganui; Noel Mingins -Taranaki; Ian Lowe -Palmerston North; Neil Brown -Dunedin; Leslie Pester-Waimakariri; John Fisher, Paul Bau -Environment Canterbury; Tom Shaw - Southland; and Wilson Brown - Selwyn.

The key issues raised at the focus group meetings were:

- Current information management is unacceptable and shortcomings must be addressed
- Systems have to be simple, easy to use and relevant to responders
- Any system has to handle the differing requirements and authorisations at local, regional and national levels.

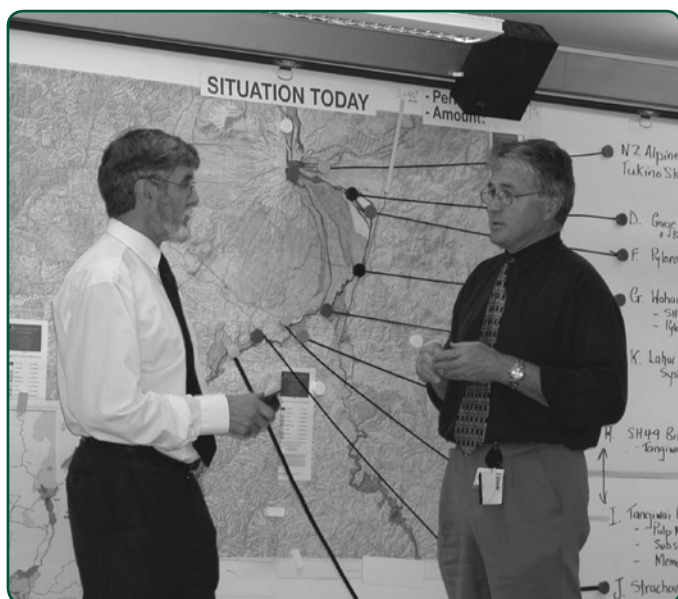
A consolidated set of requirements and specifications was developed from these meetings. These have been subject to considerable review to the stage that they are now representative of the sector's needs.

National requirements

At a national level, it is Government's intention that such a system would be used by all of the potential lead agencies operating in the National Crisis Management Centre (NCMC). As such Working Knowledge have also been consulting with Ministry of Health (MoH), Ministry of Agriculture and Forestry (MAF) and Police to see if the same requirements fulfil their needs.

In November, the Ministry issued a Registration Of Interest (ROI) for vendors who potentially had a product that could fulfil the sectors' requirements. This was done by Working Knowledge in conjunction with the Department of Internal Affairs who are the Ministry's IT advisors. These replies will be collated and considered to determine which vendor will be asked for a proposal in a selected RFP (Request For Proposal) process.

Once a suitable system has been selected and the costs associated with its implementation identified, the Ministry will report back to ODESC (Officials Domestic External Security Committee) and Cabinet with its recommendations. It is expected that this will happen in early 2003.



Ministry staff at one of the monthly Readiness exercises to train on the systems and processes in the National Emergency Operations Centre.

Top – Director John Norton (left) being “briefed on the situation” by National Controller Mike O'Leary. Right – Planning and Intelligence Officers Richard O'Reilly and Fi Coster preparing an update for the ODESC (Officials Domestic External Security Committee).

Lahar Response Plan

By Bernie Rush, Emergency Management Advisor

The threat of a lahar from the Crater Lake on Mt Ruapehu has been the catalyst for bringing territorial authorities, central government departments, emergency services and business stakeholders together for the purpose of developing a joint lahar response plan.

For the purposes of the Lahar Emergency Response Plan, the mountain has been divided into two parts and two working groups have been formed. These are the South Ruapehu Emergency Management Committee (led by Ruapehu District Council), and the North Ruapehu Emergency Management Committee (led by Taupo District Council and Police).

Earlier this year, the South Ruapehu Emergency Management Committee developed an interim response plan which was signed off by Police, NZ Fire Service, Ambulance and other participants of the South Ruapehu committee.

With the interim response plan in place a project manager was engaged to develop a more comprehensive plan. A draft of this plan was sent out to all the participating agencies in early November. The final response plan is expected to be in place in early 2003.

Early warning system

There are three lahar early warning systems on the mountain. These are the ERLAWS (Eastern Ruapehu Lahar Alarm and Warning) system managed by DOC (Department of Conservation) plus two other systems owned by Tranz Rail and Genesis Energy.

Work is in progress to have the ERLAWS system connected to the Police Communications Centre through the 111 system. Procedures are also being developed to coordinate the Tranz Rail and Genesis systems and integrate them into the emergency response plans.

Lake level monitoring

The two emergency management committees are working with DOC on Crater Lake levels. The purpose of this work is to provide warning of the possibility of the lahar event occurring.

The lake level warning system will be tied into a system of emergency preparedness activation levels. As the lake level approaches the 115% full mark, emergency responders will upgrade their preparedness levels to match the risk. Proposals in the plan include an increased level of awareness and an upgrading of resources if required.

If the Crater Lake continues to fill at its current level it is anticipated that a lahar event will occur in 2005/6. The Crater Lake is currently 73% full and is not expected to become a serious threat until it gets over the 100% full level.

Communications plan

The Ruapehu District Council, working with the Ministry of Civil Defence & Emergency Management, Department of Conservation, horizons, mw and the Taupo District Council have developed a communications plan to ensure a coordinated approach to communications issues relating to this lahar, including programmes to raise public awareness and preparedness.

Warnings - technology working for us

By David Coetzee, Emergency Management Planner

Under the National Civil Defence Plan, one of the key areas of responsibility for the Ministry of Civil Defence & Emergency Management is the monitoring and the issuing of warnings in respect of hazards that might lead to, or worsen civil defence emergencies. The Ministry continuously strives to improve its capability in this regard by reviewing its internal procedures and by taking advantage of new technological developments.

Since the start of this year CDMA (Code Division Multiple Access) cell phone technology has been in use by the Ministry's Readiness Unit and its Emergency Management Advisors in Christchurch, Auckland and Wellington. The new digital cell phones allow for email and Internet access by phone, and have already proved to be an invaluable instrument for our monitoring and warning capability. It enables personnel to receive text information from key sources of information like the Institute of Geological and Nuclear Sciences (GNS), MetService and Pacific Tsunami Warning Centre (PTWC) without the need of access to an Internet linked PC. Likewise, when the duty officer receives a telephonic alert call he/she has the ability to immediately access the websites of the mentioned agencies and any other sources to verify or interpret the information.

In addition, the Ministry is currently testing the recently introduced CDMA-1X cell phone, also known as Mobile Jetstream. This service will allow the Ministry to connect between laptops and computer systems at greatly increased speeds, e.g. 80 kbps as opposed to 14.4 kbps using the current CDMA phones (a 400% improvement). Pending the results of this trial period, a decision will be taken as to its suitability to further enhance our capability.

In a further attempt to improve on its response time to issue warnings, the Readiness Unit has also added E-fax. Through E-fax, email and fax warning messages can be sent to wide audiences address lists by any Microsoft Windows-based computer. This means a warning message can now be compiled and faxed from the duty officer's PC or laptop.

To achieve better public service and response, the Ministry's 24hr emergency number (going to the duty officer's cell phone) has recently been transferred to a privately operated 24-hour answering service. This ensures that all calls are answered (avoiding possible activation of a message system) and it is then passed on to the duty officer for action. In the event of the duty officer not answering, a call plan is being applied to ensure that one of the Ministry's personnel does take the call in person.

Lahar report quantifies risk to life

continued from page 16

and may be much lower, but we cannot say with confidence that it would be much less than 10%.

- The main contributors to the risk of there being a fatal accident are road accidents associated with the lahar, and events at the Tangiwai Memorial. The likelihood of a passenger train accident is significantly lower (less than 0.1% with current arrangements, realistically reducible to less than 0.01%).
- The measures required to progress from the “could be 40%” to the “less than 10%” state are described in detail in the report. In summary, the measures involve:
 - removing risk on SH1 by further measures to protect the road from lahars
 - closing the high risk Tangiwai Memorial site, car park and toilets
 - enhancing warning and response arrangements at Tangiwai itself
 - enhancing readiness, warning and response arrangements downstream of Tangiwai, and
 - reducing possible risk to people in the Tongariro River associated with Genesis Power’s response actions to lahars.

The report notes that priorities for emergency response after the lahar event should focus on enhancing warning and response arrangements at Tangiwai itself, and enhancing readiness, warning and response arrangements downstream of Tangiwai, and not on attempting to send personnel high up on Mt Ruapehu to warn and evacuate people. Risk management on the mountain should focus on managing access to at-risk areas.



The Tangiwai Memorial site is virtually certain to be severely damaged by the lahar in most of the scenarios. The report recommends that the site, car park and toilets be closed as part of response arrangements.



In the extreme event scenarios, travel times for the lahar to the Tangiwai bridge are around 90 minutes with expected peak flows of up to 1800 cubic metres per second. This would place the bridge at risk.

The report also states that if risk reduction to a less than 1% chance of a fatal accident is required, or the costs of achieving the “less than 10%” or “around 1%” levels are considered excessive, then the decision to allow the lahar to happen when nature dictates it would have to be revisited.

Lahars in the Whangaehu Valley

Mt Ruapehu is one of the most frequently active volcanoes in the world, erupting every 1-3 years on average. More than 60 lahars have been recorded at Mt Ruapehu since the 1860s, with the most recent taking place in 1995/96. These emptied the Crater Lake and deposited up to 7 metres of sandy ash on the crater rim, thereby increasing the lake’s capacity and creating an unstable dam. The Crater Lake, located over the vent of the volcano, often emits a rapidly flowing mixture of rock debris and water, known as a lahar or mudflow. The Whangaehu Valley is the main lahar path for Mt Ruapehu. The lahar that caused the 1953 Tangiwai disaster was the most hazardous in this period, closely followed by the 1975 lahar but much larger lahars have occurred over the last 1000 years.

Scientists predict the makeshift dam will fail sometime between late winter 2003 and the summer of 2005/06. In the worst case scenario, the dam would suddenly give way once the water reaches the rim, releasing approximately 1.4 million cubic metres of water and ash down the mountainside. In other scenarios, the lahar would happen less dramatically and the effect would be less severe.

Lahar report quantifies risk to life

The risk assessment report commissioned by the Ministry of Civil Defence & Emergency Management quantifies for the first time the risk to life resulting from the potential Mt Ruapehu Crater Lake lahar.

The Director of the Ministry of Civil Defence & Emergency Management John Norton said that a lot of good work has been done to understand the threat which arises from a 7m high tephra dam formed over the crater rim outlet during the 1995 Ruapehu eruption. As the crater lake rises against the dam, it will collapse and form a damaging lahar flow down the mountain. The crater lake is currently still 14m below the 1995 outlet and the lahar is not expected to occur before the summer of 2003/4 and could be as late as 2005/6.

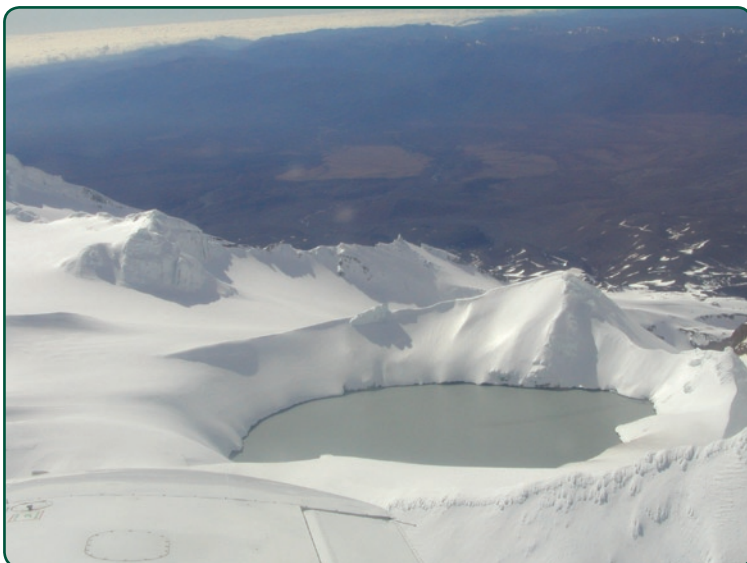
“ Our focus is on risk to human life in the first instance and coordinating with utilities on risks to their assets. Working with the Department of Conservation, we are continuing to monitor and assess the risk posed by the lahar, and we are facilitating the preparation of response plans with local authorities and agencies to ensure they will be effective, “ Mr Norton said.

“Now that we have the report, we are working with DOC to investigate ways to reduce that risk to life. Options under discussion include investigating possible low impact intervention at the crater’s rim to manage the timing and size of the lahar.”

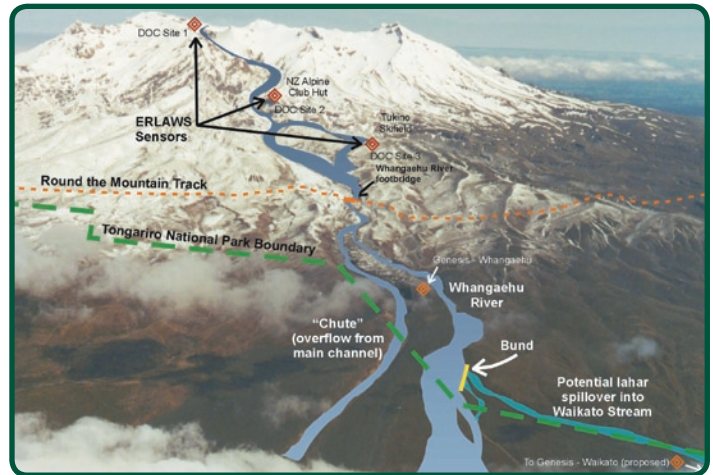
The report, which was written by Dr Tony Taig, a United Kingdom risk management expert, considers the nature and scale of the anticipated lahar, how the lahar flow will develop as it travels down the mountain, the risk to key assets and infrastructure in the path of the lahar, the risk to people if those assets are damaged and the effectiveness and reliability of warning and response systems.

Key findings in the report

- There is a wide range of possible sizes of the anticipated lahar. These have been modelled by a scientific panel with a range of 24 scenarios addressing variations in



Aerial view of the Mt Ruapehu Crater Lake in September 2002



Mt Ruapehu from the East showing path of lahar (in blue) and sites of ERLAWS sensors and bund [Photo: Dave Wakelin, DOC]

- levels of the crater rim outlet below the tephra dam
- heights of the crater lake up the dam at the time of failure
- rates of failure of the dam once it does fail
- bulking factor as the lahar flows down the upper mountain
- There is a high degree of uncertainty as to when the tephra dam will fail and the lahar will happen, but general agreement among experts is that it will fail quickly when it does fail, and the lake is likely to reach a level high up the dam before failure.
- The anticipated flows down the mountain span a wide range of possible sizes of lahar. Most scenarios involve flows above, and travel times below, those experienced in the 1953 lahar which led to the Tangiwai rail disaster. Some scenarios involve lower, less damaging flows.
- The bund constructed at the bottom of the Whangaehu Gorge to prevent flow crossing over to the Waikato Stream is considered highly effective in preventing such crossover.
- The Tangiwai Memorial area and Strachan's Bridge are virtually certain to be severely damaged by the lahar; the rail and road bridges at Tangiwai, and the Tiorangi Marae Bridge, are at high risk (30 to 80% chance of severe damage). There is uncertainty as to the risk to SH1 in the vicinity of the Wahianoa Aqueduct, while the level of risk to SH1 at the Waikato Stream crossings is significantly lower because of the effectiveness of the bund.
- With the arrangements in place at the time of the writing of the report in July 02, with ERLAWS partly commissioned, Transit automated barriers on SH49 not yet in place, and rudimentary local response plans, the residual risk of somebody being killed as a result of the lahar could be as high as 30 or 40% or as low as a few per cent. This uncertainty is unlikely to be reduced much by further analysis.
- With measures already in progress or planned, and other measures identified in this assessment put in place, we can be confident of reducing this residual risk to a less than 10% chance of somebody being killed as a result of the lahar. The risk is uncertain

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