

Sichuan quake: Immediate rescue response



May 12, 2008, saw an earthquake which devastated eight Chinese provinces, as reported in *CRJ* 4:4. The final death toll was nearly 70,000, writes **Brendon Morris**, who was invited to China recently to discuss the response

THE TECHNICAL RESCUE RESPONSE

can be considered in two waves. Firstly survivors and local rescue officials started trying to extricate trapped survivors immediately. The second wave was the military response, along with nationally co-ordinated specialised earthquake rescue units – China Earthquake Administration (CEA) teams.

These two elements of the second wave must be considered separately with regard to ability and specialist expertise. Much has been written about the military's lack of specialised technical rescue expertise, in contrast to the experience and ability of the CEA teams.

Both of these rescue waves were faced with challenges unique to the time when they were active. In the initial response of the first wave there were limitations with rescue equipment not being available. In the second wave they faced issues related to the co-ordination of response and communication, which was to be expected.

I was privileged to be invited to the affected area to contribute to the 'Global Dialogue on Wenchuan Earthquake Response', an opportunity to get a better idea of some of the immediate rescue response issues. It was interesting to listen to these first wave responders and hear how they battled with similar challenges.

EQUIPMENT ISSUES

In general, they faced the usual issues regarding co-ordination, communication and experience. When considering equipment, the conclusions could be grouped under the headings: Portability; heavy lifting capacity; and specialist cutting capacity.

Portability has often been discussed in regards to technical rescue in structural collapse incidents. The same issues were seen in this disaster. The need to get equipment over the rubble pile was often limited by the weight and size of the equipment.

When choosing and testing new equipment, how to get it to where it is needed is not always adequately considered. Smaller, more



Two proportionally sized lifting jacks are used for heavy lifting

portable tools and pumps are often more user-friendly, are readily available and should always be strongly considered for use in these kinds of applications. The mistake is in thinking that 'bigger is stronger', but high-pressure technologies mean that tools and pumps can be light and compact, yet still very powerful.

A good example is the changing face of battery powered extrication tools. Owing to the limitations of older battery and pump technology, these had separate batteries connected by cable to the – often heavy – tools. With batteries now being far lighter and easier to charge, coupled with micro pump technology innovation, battery powered rescue tools have evolved; many are now totally self-contained. Using lightweight battery technology and these new micro-electrically powered hydraulic pumps, everything can be incorporated into the tool – a completely self-contained package. These innovations have removed the need for pumps and hoses for smaller capacity tools.

Heavy lifting capacity is a very important capability for initial rescue activities. In many cases people were trapped by something

heavy that simply needed to be lifted. Heavy-duty hydraulics, such as hydraulic wedges, to create lifting bag insertion gaps are already extensively used in USAR operations, but were not always available in this disaster, only coming with the CEA teams. Together with 50-ton aluminium lifting jacks, there is an increasing amount of use of this type of hydraulic gear in heavy lift operations. These aluminium versions of industrial lifting jacks make for a lightweight jack that can be used to support and lift in operations not previously possible without heavy-duty industrial equipment.

Alongside a hydraulic wedge, high pressure lifting bags can be well applied to lifting operations. Often there is a limited initial insertion space between concrete components that need to be lifted. A hydraulic wedge allows an opening large enough to place the first bag, so one can progressively lift something that would otherwise have been impossible to start lifting with bags.

Specialist cutting capacity does not always need to be bigger to be better. In many instances the larger, more powerful cutters designed primarily for vehicle extrication can be too bulky for collapsed structure rescue, where requirements are usually smaller cuts of reinforcement bars in concrete and other hardened materials. Most rescuers agree that this work can more easily be done with smaller specialised cutters, though in some instances a traditional larger cutter will be required. So compact specialist cutters cannot replace the need for traditional tools, though this sort of specialised cutter makes a good addition to rescue sets.

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