Improving the management of emergencies: enhancing the ICS

by Julian Yates

Rare indeed is the emergency that a single emergency service can manage totally independently without some form of cooperation or assistance from other emergency services or supporting agencies. At many incident scenes, two, three or more agencies must work together cooperatively to provide the emergency response.

Achieving the necessary level of cooperation between agencies can be problematic: each will have developed its own unique operating procedures, protocols and methods for managing their response to emergencies. The result can be unnecessary confusion, doubt, duplication and missed opportunities.

As an attempt to overcome these problems, in the late 1980's, the then Australian Association of Rural Fire Authorities (AARFA, 1989) introduced the Australian Inter-service Incident Management System (AIIMS). The core of the AIIMS is the Incident Control System (ICS) that aims to provide an integrated structure to manage the response to any emergency incident that can be used by any organisation involved in the response. The AARFA (1989, p. 6) promoted the AIIMS as enabling 'managers to more effectively utilise the combined resources of co-operating fire and emergency services'.

In the decade since introduction of the AIIMS, its acceptance and use has not been without controversy and debate. The author clearly remembers a heated debate at the Australian Institute of Emergency Management between two senior officers on the merits or otherwise of the ICS. One was a senior police officer and the other a senior fire officer, both from the same state. The fire officer argued passionately on the merits of the AIIMS ICS, while the police officer was equally adamant in his statements on its faults. The debate continued off and on for several days without resolution.

The purpose of this article is to present a case for introducing an enhanced model of the ICS component of the AIIMS that has the potential to overcome some of the concerns held by emergency managers on the functionality of the ICS, both here in Australia but also internationally.

To achieve this, the first step will be to examine the origins of the ICS and its adoption in Australia, discuss its key features and identify some key issues that it does not, in its present form, adequately cater for and then present an enhanced model for consideration. The enhanced model, it will be argued, offers considerably improved functionality without losing any of the key features of the ICS and does not require significant change to existing ICS training, nomenclature or procedures. Because the model is based on an enhancement implemented in California, it will also be argued that it has been proven through overseas experience.

Origins of the ICS

Problems with the absence of integrated management systems for emergencies and disasters were highlighted by series of wildfires in California in the late 1960s where deficiencies in management systems for multi-agency responses were identified (Coile, 1996). As a result, a system for managing the response to emergencies when multiple agencies were involved was developed. This system was known as the Incident Command System or ICS. The ICS envisaged a single Incident Commander supported by four functional sections: operations, planning, logistics and finance.

The importance of developing the ICS to the United States can be found in its system of providing emergency services. Unlike Australia, in the US many emergency service agencies are provided by municipal councils as well as by the state and federal governments. The US Department of Justice (1998) estimates that there are over 18,700 state and local law enforcement agencies, while the United State Fire Administration (1999) reports over 30,000 fire departments nationwide. The result of this is that multi-agency responses to emergencies are very frequent. It is not uncommon to have several separate police forces, fire services and ambulance agencies all responding. Without a common incident management system, the potential for chaos was high.

By 1980, the Californian ICS had been widely adopted by fire departments and had become part of a national initiative called the National Interagency Integrated Incident Management System or NIIMS (National Response Corporation, undated). The use of the ICS received statutory backing when US Federal Law required its use for the response to hazardous materials emergencies (Federal Emergency Management Agency, 1998). States such as California (Coile, 1996) and Alaska (Federal Emergency Management Agency, 1997) made its use mandatory by state agencies and local governments wishing to receive state assistance during emergencies and disasters. The use of the ICS also spread internationally with British Columbia in Canada, for example, introducing a variant of the ICS for use by all provincial agencies (Government of British Columbia, 1997).

Adoption in Australia

The Australian Inter-service Incident Management System (AIIMS) was developed by a committee under the auspices of the then Australian Association of Rural Fire Authorities (1989), since amalgamated into the Australasian Fire Authorities Council (AFAC), in the late 1980s. The system developed by the AARFA was based on the NIIMS with modifications to suit the Australian environment. One of the most significant of these was to call the core operational component of the AIIMS the Incident *Control* System, in contrast to the North American Incident *Command* System[1]. This change was to make the terminology used in the AIIMS compliant with existing Australian definitions of command and control. Since command was defined as functioning vertically within organisations and control as functioning horizontally across organisations, the use of control was more appropriate in the Australian context.

To support implementation of the AIIMS, the AARFA developed a comprehensive series of training manuals and videos together with operational guides and materials for use in the field at incident sites. When AFAC came into being, it took over the production and distribution of AIIMS materials.

The AIIMS has been widely adopted by most Australian fire services. Its use outside the fire services is difficult to determine precisely on the information available, although it appears from anecdotal evidence that only a few non-fire services have

1. In this article, the abbreviation ICS will be used for both the *Incident Control System* (Australian) and the *Incident Command System* (USA). The context of the usage will indicate which is being referred to.

adopted it. Non- fire organisations that have include Sydney Water and Taronga Zoo and several other NSW based agencies are evaluating it (Parsons, personal communication, 3 May 1999). As noted above, heated arguments over the merits or otherwise of the AIIMS and its ICS operational element have been observed between members of services that do and do not use it.

The AIIMS/ICS in Australia

It is appropriate at this point to provide a brief discussion of AIIMS and the ICS as adopted in Australia. The discussion is based on the description of the AIIMS and the ICS provided by the AARFA/AFAC in its publication *The Australian Inter-service Incident Management System: Teamwork in Emergency Management*, initially published in 1989, but now in its 3rd edition (AFAC, 1994a), and the AFAC AIIMS Operating System Manual (AFAC, 1994b). ICS training materials produced by the Fire Services Division of the Fire & Emergency Services Authority of Western Australia and the US Federal Emergency Management Agency (1998) are also drawn on to provide additional information where needed.

The AIIMS is a set of five sub-systems: the ICS itself, a Training system, a Qualifications & Accreditation system, a Publications Management system and a Supporting Technology system. It is only intended to discuss the ICS element in this paper. This is because the other four sub-systems are supportive to and dependent on the ICS and are not directly relevant to a discussion of enhancing the operational capability of the ICS.

The ICS is the operational heart of the AIIMS. It is intended to provide a common management structure and vocabulary that can be applied to any form of emergency and can be used by any agency. The AARFS stated that the AIIMS 'can be used to respond to public emergencies . . . such as floods, cyclones, earthquakes . . . storms, major aircraft accidents and hazardous materials spills.' (AARFA, 1989, p 6).

Two important concepts are embodied in the ICS. The first is Unity of Command—this concept specifies that a person can only report to one supervisor and that supervisor in the ICS structure need not be from the subordinate's parent organisation. Closely associated with this is the span of control that a supervisor should have—the ratio of one to five is considered optimal and one to seven is the maximum allowable. The second important concept is that of Unified Command—this is where there is an identified and agreed strategy or set of strategies being used by all participants to combat the emergency. In other words, everyone will be working to the same game plan, promulgated through a single supra-organisational management structure. *Figure 1* shows the key structure of the ICS.

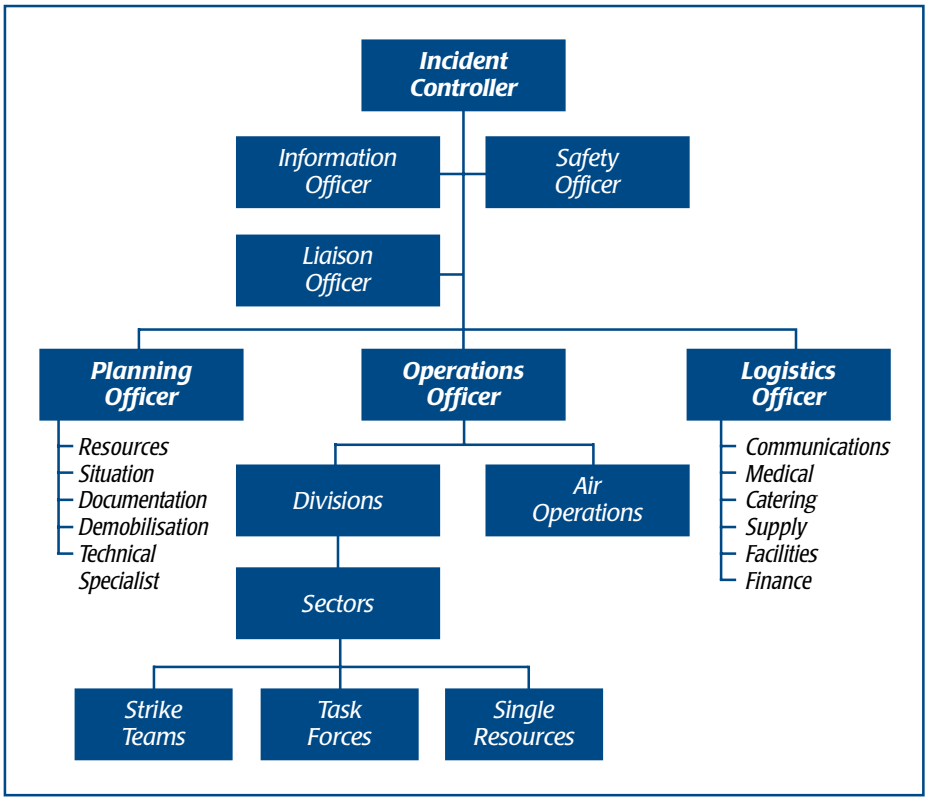

Figure 1: Basic ICS structure (Source: AFAC, 1994b)

As much or as little of the ICS structure is activated as needed to respond to the emergency. The Incident Controller is responsible for the overall management of the operation and is normally appointed by the agency with primary responsibility for managing the emergency. For many smaller incidents the Incident Controller will not need to establish any subordinate positions, being able to undertake all of the duties personally. As the complexity and size of the emergency increases, the Incident Controller establishes subordinate positions as required to meed the needs of the situation. Exceeding the span of control criteria of one to five often forces the establishment of a new subordinate position to bring the span of control back into line. For example, the Incident Controller may decide to personally provide the Logistics and Planning functions, whilst appointing an Operations Officer to manage the operations of several strike teams and task forces.

Similarly, as the span of control, complexity, distance, etc, requires, the head of a function, such as the Operations Officer, may need to establish subordinate positions. In Figure 1, the Operations Officer has Division Commanders managing Sector Commanders who in turn manage strike teams, task forces and single resources[2]. Conversely, as an operation winds down, subordinate positions may be progressively amalgamated with their peers or superiors as operational complexity or size reduces.

The Incident Controller plus the heads of each of the three functional areas (Planning, Operations and Logistics) form the Incident Management Team (IMT). The role of the IMT is to formulate, under the direction of the Incident Controller, the plan for the management of the emergency, including the development of strategies, goals and objectives to be achieved. For larger incidents the plan should be written and formally disseminated so that all participants, particularly those in management positions, know what their role is and the expectations being placed on them are. For smaller incidents, a verbal plan may be all that is required. For those incidents where the Incident Controller provides all of the management structure personally, then the plan may a mental concept only.

Personnel for each position should be appropriately trained for the position, both in terms of understanding the ICS and in terms of the specific skills needed for the position. In theory, it does not matter which organisation a person comes from—provided they have the requisite skills they can fill any position. In practice, however, the agency with primary responsibility is likely

2. A *Strike Team* is a set of resources of the same type e.g. a set of fire vehicles and a leader. A *Task Force* is a set of differing resources brought together to undertake a task e.g. two fire vehicles, a bulldozer and a water tanker, plus a leader. A *Single Resource* is an individual unit, including personnel and a leader, undertaking a task e.g. a police vehicle closing a road.

to provide the majority of the personnel for positions in the Operations hierarchy if only because it is their personnel who are likely to have the necessary operational skills.

National developments

In 1998, following a consultative development process with the States and Territories, Emergency Management Australia (EMA) released its *Guide to Multi-Agency Incident Management* (EMA, 1998). The guide's aim is 'to provide . . . the emergency services involved in multi-agency response with guidance on incident management that is compatible with State emergency management plans and arrangements and which facilitates national inter-operability.' (EMA, 1998, p 1).

The guide also notes 'some of the material within the guide may appear similar to elements of the AIIMS. However, the material contained in this document is drawn from a number of sources and no preference is inferred.' (EMA, 1998, p. ix). This guide is not obligatory on any Australian emergency service.

The systems in the Multi-Agency Incident Management Guide are very similar to the AIIMS, although the Incident Controller becomes an Incident Manager and there are six functional sections not four (Planning, Intelligence, Operations, Logistics, Communications and Media; Finance is excluded as a functional section). The manual also briefly covers issues such as establishing field headquarters and operational decision-making. *Figure 2* shows the management structure proposed in the guide.

The structure proposed in the *Multi-Agency Incident Management Guide* does not consider the arrangements needed for subordinate levels below the functional level, leaving that to be determined by the States and the needs of the operation.

International developments

Based on experience in recent major flood response operations in North America, there has been discussion on altering the structure of the North American version of the ICS to add a new 'Information' function to the existing four functional sections: operations, planning, logistics and finance (Parsons, personal communication, 3 May 1999). It is argued that the demands for public information in large-scale emergencies are becoming so demanding that Information should be a discrete function in its own right. It remains to be seen if this debate will result in change to the ICS used in North America. It is pertinent to note that the Australian Multi-Agency Incident Management Guide already accepts this need by recommending the establishment of a discrete Media function.

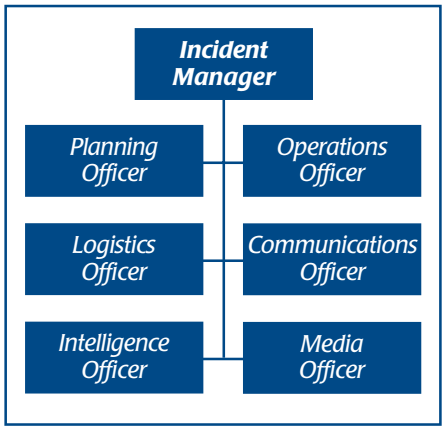

Figure 2: Australian Multi-Agency Management Structure (Source: Multi-Agency Incident Management Guide, EMA 1998)

ICS critique

As has been mentioned previously, the ICS has its proponents who argue vehemently that it can be used in any circumstance or any operation. Indeed, the AARFS has stated that it can be applied to manage virtually any hazard, be it a tropical cyclone or a vehicle accident. There is a countering view, however, that argues that the ICS is a bureaucratic imposition designed to impose a rigid, quasi-military command and control structure ill-suited to managing the complex interactions required in community response to disaster. No less an authority than E. L. Quarantelli (1997, p 48) has stated:

'The spread of the Incident Command System (ICS) as a model for managing disasters is a contemporary manifestation of the thinking that such occasions must be 'controlled'. Yet research shows that the ICS is not a good way to manage the situation, despite its recent faddish adoption among some American emergency organisations.'

Like most things, the truth probably lies somewhere in between the extreme positions. The ICS, in its American variant, is widely used by a large and diverse range of agencies, albeit that many are fire services, to manage the response to emergency incidents of all types. It is endorsed as the national management system by the US Federal Emergency Management Agency (FEMA) who offer a range of ICS training courses, some accessible over the Internet. It is unlikely that a system that had any fundamental flaws would have received such wide acceptance or so high a level of endorsement.

This is not to say that the ICS cannot be constructively criticised. Coile (1996) has noted that in the United States, the ICS has been perceived as primarily a fire service system and as result is not used by all agencies, particularly the police. It also had limitations in that it was designed to cope with incidents—its primary focus was on providing a management structure at the incident. It did not articulate into higher level structures, if any; nor did it cater for multiple incident events. It is pertinent to point out that the British Columbian ICS system expressly states that it is intended for use in the field at the site of the emergency (Government of British Columbia, 1997).

These issues were addressed in California in the early 1990s. The California State Legislature passed an ordinance requiring the use of a revised version of the ICS for all multi-agency emergencies. It was compulsory for all state agencies and local governments were also required to use it if they wished to access state financial assistance post-disaster. The new system was called the 'Standardised Emergency Management System' or SEMS.

SEMS builds on the ICS, retaining its incident level structure, with the addition of four successively higher levels of response that provide an organised structure as needed to manage multi-incident events. The levels are: Field (the original ICS level), Local Government, Operational Area, Regions and State.

The basic ICS structure of an Incident Commander and the four functional sections is retained at each level with the exception that the Incident Commander becomes the Incident Manager in each of the four levels above Field. This was because the term 'Manager' better described the functions of the position. Each Incident Manager can have one or more Incident Managers or Commanders from a lower level reporting to them. *Figure 3* shows the outline SEMS structure as used in California.

At each level in the SEMS structure, common subordinate structures, terminology and procedures are used. As far as practical, the commonality extends across levels, thus allowing common training and the ability for to work at any level with minimal additional training. Levels can be activated as required depending on the needs of the situation. It is quite practical to activate the higher levels without necessarily activating subordinate levels. For example, strike teams can be directed by the Local Government level without necessarily establishing the Field level. Once again, span of control, complexity and size determine when a higher or lower level is established.

The requirement to use the SEMS is established in law and is obligatory on all Californian state agencies and is required to be used by local governments if they wish to access state assistance.

The Californian SEMS addresses many of the issues considered problematic with the original ICS. Firstly, it recognises the importance of using a management focus as

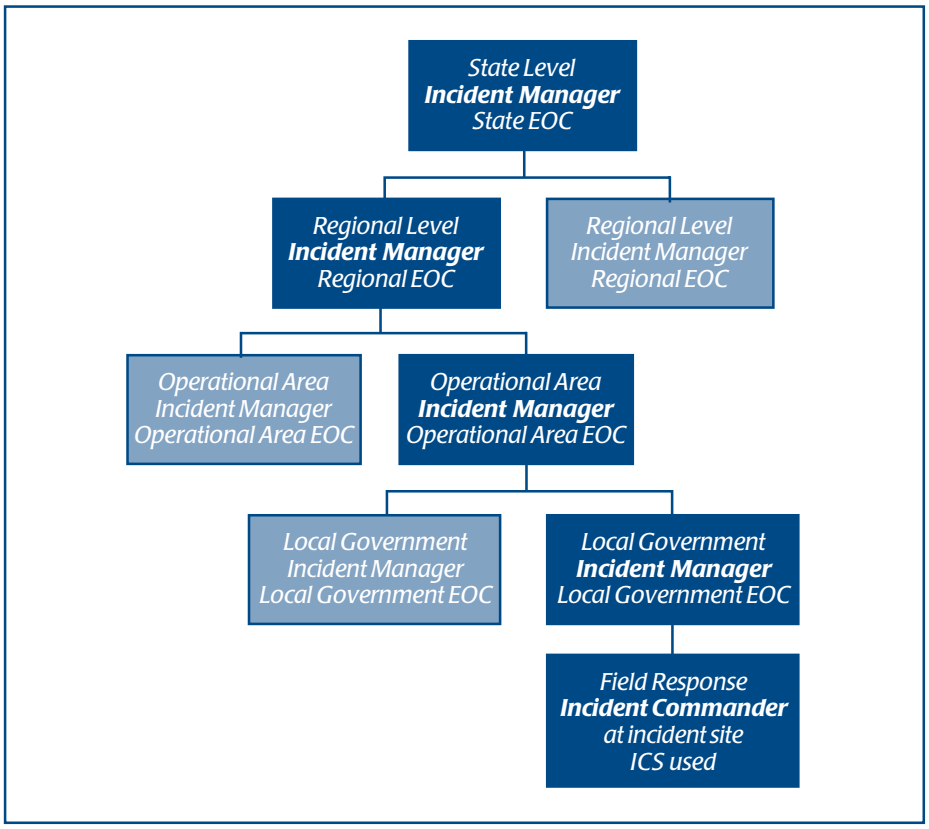

Figure 3: Californian Standardised Emergency Management System (Source: adapted from Coile, 1996)

opposed to a control focus when managing a disaster or emergency at the community level or higher. The management focus at the higher levels is appropriate because those levels should be taking a more strategic view rather than the tactical or control focus used in the field. This also goes some way towards addressing Quarantelli's (1997) concerns over the imposition of a command and control culture to manage disasters, although he may still take issue with the SEMS concept of one person at each level being responsible as either the Incident Commander or Controller, or the Incident Manager.

Secondly, the SEMS establishes a management structure that builds on top of the ICS. This is important because the ICS by itself does not provide clear and unambiguous links into higher level structures. The ICS training manual issued by FEMA (1998, p 1–14), for example, notes the need for the ICS to work with Emergency Operations Centres (EOC), but the following extracts from the manual leave doubt about how this is to happen:

Most jurisdictions maintain an EOC as part of their community's emergency preparedness program. The proper interface between the EOC and the on-scene management should be worked out in advance, if possible. The ICS structure and the EOC function together with the same goals, but function at different levels of responsibility. The ICS operation is responsible for on-scene response activities, and the EOC is responsible for the entire community-wide response to the event.'

California's SEMS provides a comprehensive hierarchical system that builds on the ICS, using its principles and establishing the systems for interaction between the field or scene oriented ICS and the community and management focus of the higher levels. This overcomes the uncertainty evident in the FEMA ICS manual referred to above by establishing and defining the links between the levels before the disaster strikes.

Thirdly, the SEMS is compulsory for use by all state agencies and is effectively so for local government, thus overcoming the problem of the system not being universally adopted. The SEMS is also supported by a comprehensive set of training materials to enable personnel to become proficient in its use.

Finally, the SEMS correctly locates the ICS component at the field or incident scene level. This addresses one of the key problems associated with adopting the ICS and attempting to use it to cope with all forms of natural and man-made[3] emergencies. Although it is claimed that the ICS can be used for all emergencies (see for example the discussion of the AIIMS above), these claims have always been contentious. The effective management of a widespread flood emergency, for example, may require the following.

- High-level regional management that considers the entire floodplain with numerous communities, coordinating warnings, levee maintenance, evacuation planning and the like. This level will often be activated well in advance of any direct flood impact given adequate warning.
- municipal or community level management focussing on the needs of a specific community or associated group of communities. This level may also commence functioning prior to the on-set of the actual emergency provided sufficient warning is available.
- emergency incident management at the site of rescues, levee failures, food and fodder resupply and the numerous other events that require urgent attention during the flood. These incidents will tend to move with the flood as it progresses down the river system. The magnitude of the flood event and the effectiveness of pre-impact prevention and preparedness activities will influence the number and scale of the incidents.

To apply the standard ICS to the management of the above event is difficult. It is not practical to have a single Incident Controller attempting direct operations at all levels, neither would it be good practice to have a series of independent Incident Controllers working at each level and incident site. The SEMS, however, provides for a system of hierarchical Incident Managers managing activities at their level, coordinating and cooperating sideways, upwards and downwards together with Incident Controllers attending to specific incidents and reporting to a higher level Incident Manager. Because the nomenclature, procedures and skills are common across the levels, appropriately trained staff from any agency can work in SEMS operations centres or ICS command posts at any level.

An Enhanced Australian Incident Management System

The ICS critique above indicates that there is room to enhance the ICS as it currently stands to provide a truly integrated system for managing emergency incidents. The need to provide a system that caters for multi-incident operations and that integrates into a hierarchical structure was demonstrated through the example of the Californian SEMS.

The possibility of implementing integrated systems to manage emergencies and disasters is one that should be seized in Australia. The days of parochialism being an acceptable practice are past. The ability of

3. In the absence of any generally accepted gender-neutral term that describes hazards that result from the direct actions of humans. Alternatives such as technological hazards or socially-induced hazards do not adequately cover the full range of events caused by human activity that can result in emergencies or disasters.

all agencies involved in emergency response to work together in an integrated management structure offers many benefits: improved coordination, greater productivity, best-person for the job, better training, common language and procedures. These are all possible if a common system is introduced.

Direct adoption of the Californian SEMS without modification is not likely to provide a completely satisfactory result. The SEMS, while it addresses the problems with the ICS, is based on a different political system and could not be directly implemented without modification to fit into the Australian environment.

The vision

An integrated system for the management of all multi-agency emergencies used by all response agencies in Australia, providing a common management structure, systems and training for use by all. The system would be compatible with and articulate into the relevant national training competencies. The system would retain the ICS as the field or incident site management system, but would integrate it with a compatible higher level structure to cater with larger, multi-agency multi-incident emergencies. For the purposes of this discussion, the system is called the Enhanced Australian Incident Management System (EAIMS).

The Integrated System

The AIIMS ICS would remain the basis of the EAIMS, as it is an effective system for use at the field operational level, retaining most of the existing terminology, systems and procedures. The functional sections of the ICS have been adjusted to comply with the new Australian Multi-Agency Incident Management Guide, but this is not critical. This is because the EAIMS can work with either the existing ICS set of functional sections or the sections proposed in the *Australian Multi-Agency Incident Management Guide*. For those emergencies and disasters that require management at levels above the field operational level, successively higher Incident Management levels would be activated. The basic terminology, systems and procedures used at these higher levels would be the same as for the ICS with the substitution of the term 'manage' in place of 'control' e.g. there is an 'Incident Manager' for each level above the field operational level. The agency with primary responsibility for managing the response would appoint the Incident Controller and Managers. Staff for the functional sections at each level would come from any organisation so long as they are trained for the function. *Figure 4* shows the structure and levels proposed for the AIEMS.

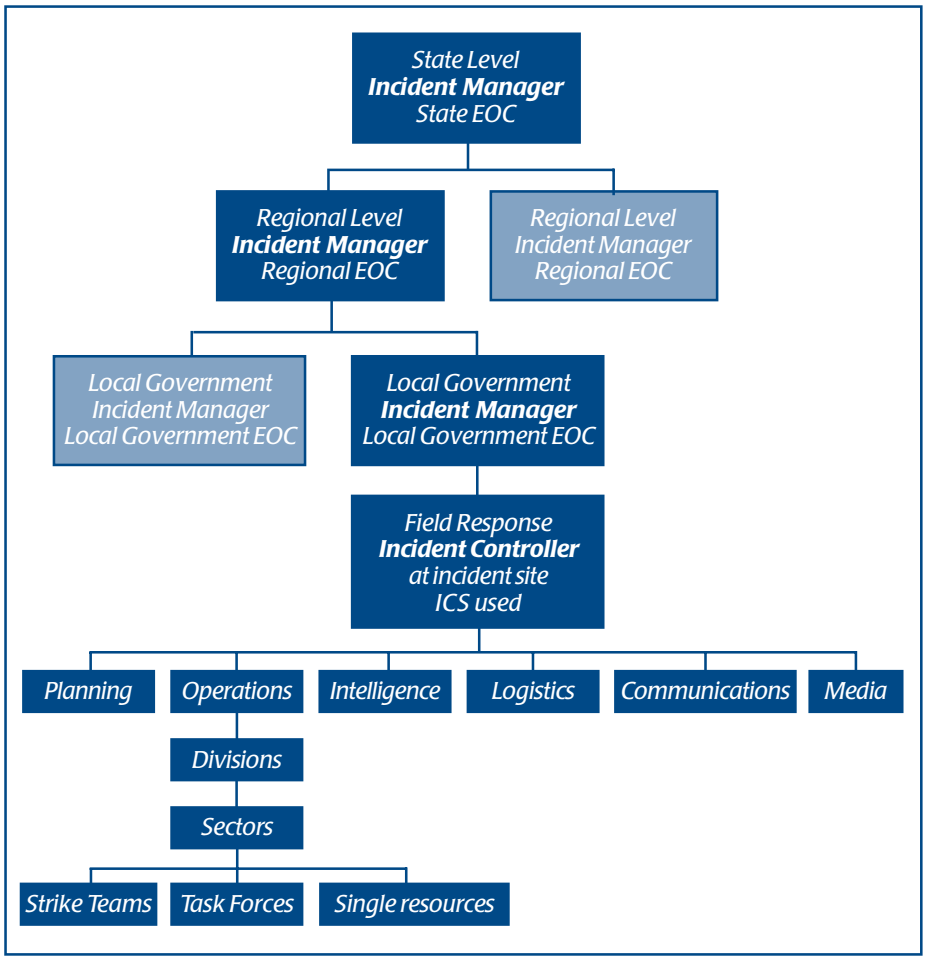

Figure 4: Enhanced Australian Emergency Management System

Figure 4 only shows the expanded structure for the field level. Each higher level in the system can also activate the functional areas needed to manage the response operation at that level. As many or as few of the functional areas can be activated at the discretion of the Incident Manager at that level. Responsibility for ensuring the function is discharged lies with the Incident Manager who is also responsible for ensuring that appropriate liaison between the functional areas takes place. It should be noted that it is important for the smooth and efficient functioning of the system that liaison between functions across levels takes place to avoid overloading the Incident Controllers. This liaison does not, however replace or supplant the responsibility for decision-making and strategy setting that lies with the Incident Controllers.

In addition to the ability of higher level Incident Managers to activate functional sections at their level, they can also deploy and control strike teams, task forces or single resources so long as span of control is not exceeded and there is no interference with a subordinate level's operations. It would, for example, be appropriate during a flood operation for a local level Incident Manager to dispatch a strike team to conduct a specific task without necessarily activating the field level. It would not be appropriate, however, for a regional incident manager to deploy a task force under direct command to the scene of an incident where there is an established Incident Controller. In this case, the higher level should allocate the task force to the Incident Controller.

Figure 5 shows a notional structure for an emergency that requires activation of two of the higher levels plus two separate Incident Controllers (and associated response elements) managing separate incidents within the same larger emergency or disaster.

The AIEMS retains the term Incident Controller for the field level. Consideration was given to replacing it with Incident Manager as used in the *Guide to Multi-Agency Incident Management*. The change was not made for several reasons. Firstly, it would require considerable re-education of the many personnel already familiar with the ICS. Secondly, it provides a clear delineation between the field ICS level and the higher management levels. Thirdly it reduces the possibility of confusion over which Incident Manager is being referred to. As the regional and state levels will be comparatively infrequently activated when compared to the field and local levels, for the majority of emergencies there will be an Incident Controller at the scene and an Incident Manager at the local level. Finally, the California SEMS

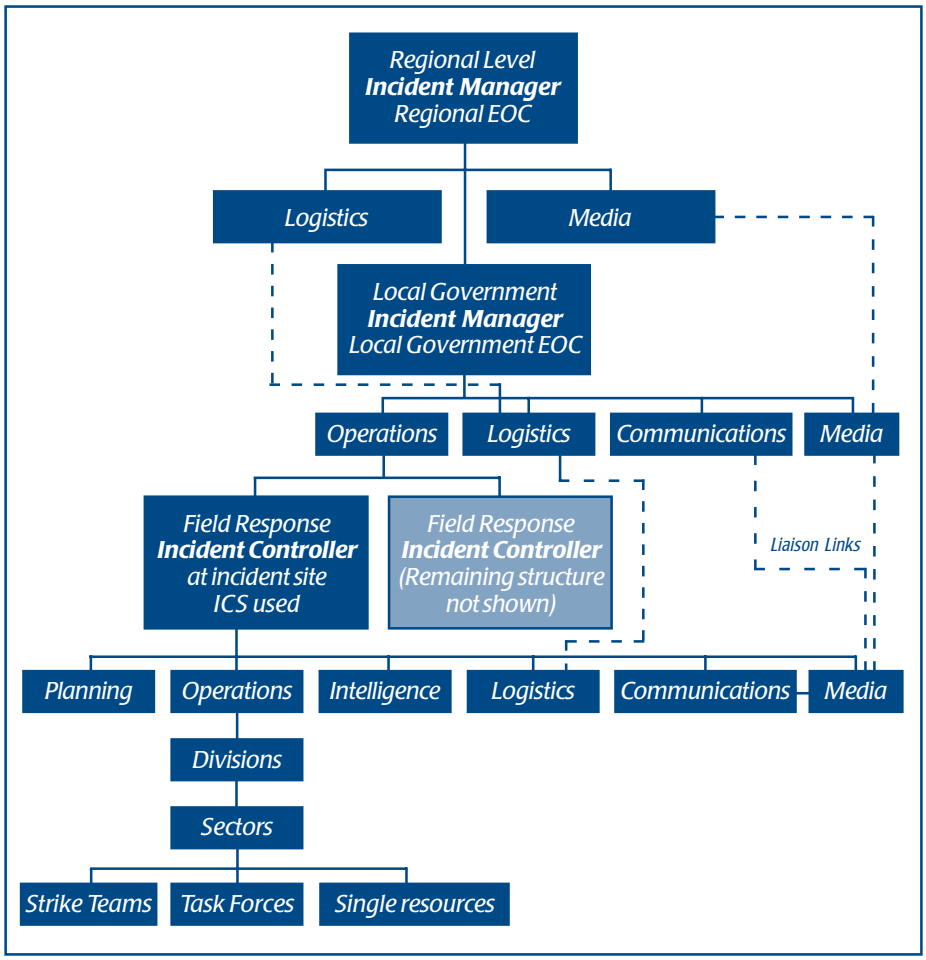

Figure 4: Enhanced structure for notional emergency

retained the Incident Controller or Incident Manager dichotomy for similar reasons.

The AIEMS should retain the Incident Management Team (IMT) concept used in the ICS, applying it to each level. Whenever a level is activated, the relevant Incident Manager or Incident Controller should form an IMT composed of the Manager or Controller and the heads of any other functional areas established at that level. The role of the IMT is to develop the strategy and plan for that level to combat the emergency. Subordinate AIEMS levels would need to be responsive to strategies and plans developed by the higher level. Equally, the superior AIEMS levels need to be responsive to the requirements of the subordinate levels and must avoid attempting to supplant the role of subordinate levels. Flexibility and adaptability will be required particularly in the early stages of an operation as it is highly likely in many circumstances that a lower level will be established prior to the higher level. In this situation, it is imperative that the higher level takes account of strategies and plans implemented by subordinate levels.

The benefits of implementing the AEIMS are:

- retaining the existing ICS systems and procedures, thus retaining the existing considerable wealth of experience and investment in training. If the modifications to the functions proposed in the *Guide to Multi-Agency Incident Management* are accepted, some modification is needed to the ICS. The concept of the AEIMS can be implemented irrespective of this, however.
- Implementing common terminology, procedures and training for use at all levels for all types of emergencies.
- Implementing an integrated management system that can be scaled up and down to meet the needs of the situation and that is compatible with the hierarchical structure used in all Australian states to manage the response to emergencies.
- More effective use can be made of the personnel available to fill positions in the management structure. Provided they have completed the relevant training, a person from any agency can fill any position other than the Incident Manager/Controller's. This is because the agency responsible for managing the response to the hazard must retain the right to place one of its officers in these positions. Some other positions, particularly those in the operational chain are also likely to require specialist skills that will be limited to the responsible agency, thus limiting the field of people who can fill these positions. Many generic positions however, such as in the Logistics, Communications, Media, Intelligence and Planning functions could come from any agency.
- Implementation of a common national training regime linked to national competencies. This would provide immediate economies of scale as most material and courses would be common to all states. It would also enhance the ability of skills to be transferable from one state to another.
- The AIEMS, being based on proven systems (the ICS and the SEMS) should have a high probability of success if developed consultatively and effectively implemented (e.g. adequately resourced).

Implementing the AEIMS should be undertaken at a national level. While it would be possible to develop it in a single state, many of the benefits will only be fully realised if the project is undertaken as a national initiative. National initiatives of this sort should be managed by Emergency Management Australia using a consultative process to engage all stakeholders and obtain commitment to the system. This must include commitment of funding to enable development and implementation of the system in each state.

Conclusion

The need for an integrated management system to improve the ability of emergency services to work cooperatively was identified in the United States in the 1960s. This resulted in the development of the ICS that was adopted by many fire services and other agencies in the US. In Australia, the ICS has been widely adopted by the fire services, with some modification, but its acceptance beyond these services has been more limited.

Deficiencies in the ICS, related to limitations when multi-agency multi-level emergencies were encountered together with the limited acceptance outside the fire services, were addressed in California through introduction of the SEMS. The SEMS retained the ICS and used its principles in a framework that provides a hierarchical structure that cates for multi-agency multi-level emergencies. The SEMS was introduced through a statutory process that effectively mandated its use by state and local authorities.

Australia faces many of the same problems that the US does in terms of managing multi-agency multi-level emergencies. At present, no generally accepted management system exists, despite the use of the ICS by many fire services. Because the Australian ICS is very similar to the US version, it has the same deficiencies in terms of the lack of a suitable higher level structure.

This article proposes a solution to this problem. Using the SEMS as the basis, the

article has described a hierarchical management system that builds on the ICS and uses its principles to provide for cooperative and multi-level management of emergencies. The system, tentatively titled the AIEMS, if properly developed and implemented offers a low-risk means of instituting a truly common, multi-agency multi-level management system that will cope with all forms of emergencies.

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Refereed

Book Review by Ralph Salisbury

Management of Animal Health Emergencies, World Organisation for Animal Health, Volume 18, No. 1, April 1999

The Paris-based World Organisation for Animal Health, usually known to veterinarians and others as OIE (Office International des Epizooties) publishes three volumes of its *Scientific and Technical Review* each year. Usually, these consist of valuable updates on occurrences and new knowledge concerning major animal diseases.

In Volume 18, No.1 of April 1999, the Organisation has departed from this format to produce a world review of the Management of Animal Health Emergencies. This single volume will be a useful reference for many years and it will be of interest to readers well beyond official veterinary organisations. Many of the authors are Chief Veterinary Officers with the responsibility for animal health emergency preparedness in their own countries.

In the Section 'Generic Principles' there are three articles. The first 'Model Framework and Principles of Emergency Management' is from Australia and uses the Australian Veterinary Emergency Plan (AUSVETPLAN) as an example of comprehensive planning. It is worth noting that the original concept for AUSVETPLAN was suggested by Roger Jones at the Australian Counter-Disaster College in 1980. It grew to become Australia's national plan and this article proposes it as a universal model. The article describes the elements that must be included in comprehensive planning. The core principles listed include organisational, command, control, coordination, information management, timely activation and the need for the plan itself to be routinely reviewed. It then lists the key issues, which are more specific to animal health plans (nature of diseases, perceived risk of introduction, legal and jurisdictional responsibilities, agreement on definitions, stakeholder involvement, resourcing, communication channels and regional and marketing implications). The article then describes how these arrangements are activated in phases from the initial suspicion of an emergency to stand-down. The other articles under 'Generic Principles' are from Europe and cover legal and international obligations, government-industry interactions and funding arrangements for major animal health emergencies.

The next section, 'Prevention and Preparedness', contains seven articles summarising the animal health emergency preparedness situations in all of the world's major geographical regions and one article describing the role of the UN Food and Agriculture Organisation's (FAO) Emergency Prevention System. A further Section 'Learning from Others' contains five case histories of outbreaks ranging from bovine spongiform encephalopathy (mad cow disease) in Switzerland to foot and mouth disease in Taipei. These articles are of general interest because they cover socio-economic aspects of the outbreaks and the problems and opportunities presented in providing accurate public information. This theme is further developed in another Australian article on dealing with unexpected or unknown emergencies. It contains cases that will be familiar to all Australians, including the equine morbillivirus (Hendra virus) outbreak, which killed both people and horses. Such cases represent the ultimate challenge in preparedness because, before the cause is known, the likely course of the outbreak cannot be predicted. The value of all of these case histories is that they were written when the control campaigns were complete or at least well established and the lessons learned had been considered in detail.

There are two articles dealing with aquatic animal health emergencies, one on the role of veterinarians in natural disasters and one on the emergency management of disasters involving livestock in developing countries. The Conclusion is written by the Australian Chief Veterinary Officer Dr Gardner Murray whose organisation played a large part in the development and completion of this publication. All but two of the articles are in English and the exceptions have English summaries.

Copies are available at approximately AUD $70 plus postage from Hunter Publications, PO Box 404 Abbottsford Vic 3067, phone 03 9417 5361, fax 03 9419 7154 or email jpdavies@ozemail.com.au.

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