EMSINA

Emergency Management Spatial Information Network Australia

ALL HAZARDS SYMBOLOGY

Project Report

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A special note of appreciation is extended to AFAC who have supported and guided EMSINA throughout this project including attending EMSINA meetings to assist in the management of this project.

Any enquiries regarding this report or the EMSINA All Hazards Symbology project can be directed to:

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Executive Summary

Emergency management requires precise and reliable information about the current state of the emergency. Considering the urgent and time-sensitive nature of emergency situations, it is necessary to collect and display spatial information in a consistent and readily understood way.

Maps and spatial information systems are an integral component of emergency management. They service the information requirements of all phases of the emergency management cycle – from prevention and preparation to response and recovery. "Almost all information required for the PPRR phases of an event, whether man-made or natural, has a locational, or spatial, component."[1]

Within Australia there is currently no agreed standardised All Hazards symbology set in use. Australian emergency management spatial information professionals, however, have long recognised the requirement for a common set of symbols. "It is well understood that mapping products and information systems that utilise a common set of symbols that are readily understood by all emergency management personnel at all levels of the incident management framework contribute to increased efficiency and safety."[2]

Acknowledging this requirement, ICSM and ANZLIC, with the support of EMSINA, undertook the Australasian All Hazards Symbology project, to develop an Australasian All Hazards symbology set. The project involved a review of current Australian and New Zealand symbology practice (including the Australian Inter-Service Incident Management System (AIIMS)), as well as the standardised approach taken by the United States Federal Geographic Data Committee (FGDC). The resulting Australasian All Hazards Symbology report recommended 81 emergency management symbols within an extensible framework that incorporated the features of both AIIMS and the FGDC.

Following the publication of the Australasian All Hazards Symbology report, EMSINA developed and managed a project, the EMSINA All Hazards Symbology project, to test the suitability of the recommended Australasian All Hazards symbology framework and symbol set within the various spatial information applications and systems utilised by emergency services and associated agencies. Following the outcomes of the EMSINA project, EMSINA is recommending:

1. The implementation of an All Hazards Symbology framework and symbol set defined by three major parameters; Categories (defined by symbol shape), Status (defined by line style) and Definition.
2. The implementation of a standard set of symbols for emergency management across Australia as detailed in Appendix A:
    - Section 1 – Forty eight (48) General emergency management symbols,
    - Section 2 – Twenty (20) Bushfire specific symbols, and
    - Section 3 – Eight (8) SES specific symbols.
3. Definitions be agreed to by the appropriate emergency management peak sector bodies and applied to the undefined symbols contained with Appendix A of this report.

This report proposes that the emergency management peak sector bodies consider this report, and endorse and adopt the All Hazards symbology framework and symbol set detailed in this report as part of their emergency management arrangements.

[1] National Spatial and Information Management Working Group (2008) *Spatial Strategic Plan 2007-2010,* p.2.
[2] ICSM (2007) *Australasian All-Hazards Symbology Project: Project Report*, p.5. http://www.icsm.gov.au

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Introduction

Within Australia there is currently no agreed standardised All Hazards symbology set used to represent features relevant to emergency managers. Maps and spatial information systems are an integral component of emergency management, servicing Prevention, Preparation, Response and Recovery information requirements.

Emergency management requires precise and reliable information about the current situation of the emergency. Considering the urgent and time sensitive nature of emergency situations, it is necessary to collect and display spatial information of the current state of the emergency in a consistent and readily understood way.

> "It is well understood that mapping products and information systems that utilise a common set of symbols that are readily understood by all emergency management personnel at all levels of the incident management framework contribute to increased efficiency and safety"[3]

The requirement for a common set of symbols has been recognised by Australian emergency management spatial information professionals for many years and has also been recognised as a requirement internationally. Within the USA, it has seen the development of standardised emergency management symbology projects including the Federal Geographic Data Committee (FGDC) Homeland Security Working Group. This group developed a standard set of symbols for use by the emergency management and first responder communities at all levels of need (i.e. national, state, local and incident) and this project and its recommendations were a catalyst and precursor for the Australasian All Hazards Symbology project.

[3] ICSM (2007) *Australasian All-Hazards Symbology Project: Project Report*, p.5. Available at: http://www.icsm.gov.au.

The Australasian All Hazards Symbology Project: 2005 - 2007

This project was commenced to develop an Australasian All Hazards Symbology set. The project was sponsored by the Intergovernmental Committee on Surveying and Mapping (ICSM) and the Australia New Zealand Land Information Council (ANZLIC), and supported by EMSINA. The primary aim of the project was to develop a consistent All Hazards Symbology set and have it adopted by emergency management agencies across Australia and New Zealand.

A consultancy was commissioned to document the outcomes of an audit of mapping symbols used by emergency management agencies. The objective of the review was to recommend a framework for Incident Management System (IMS) and All Hazard symbols along with an initial set of symbols to largely satisfy emergency management requirements.

In undertaking the project, the consultant widely consulted with key representatives of the emergency management and national security sectors through:

- five workshops held around Australia;
- a national teleconference, including New Zealand;
- meetings with Federal agencies; and
- an audit questionnaire sent to 49 agencies (of which 26 responded).

The audit results indicated that most agencies (81%) use the Australian Inter-service Incident Management System (AIIMS) as the basis for their Incident Management Systems. AIIMS was developed in the 1980s and includes a limited set of mapping symbols mostly aimed at bushfire response.

The audit results also indicated that the AIIMS map symbols are of limited application to many agencies, with only 62% of those agencies using the AIIMS symbols. The AIIMS symbols were mostly used by bushfire response agencies, who indicated that they also have a need to expand the current symbol set.

The audit revealed a high level of consistency within jurisdictions in relation to the symbols used for IMS. This consistency reflects a significant level of cooperation between agencies, particularly fire related agencies, at the state level. For example, in South Australia, there is a common symbol set used between the Country Fire Service and the Department of Environment. In Victoria there is also a high level of consistency between the Department of Sustainability & Environment and the Country Fire Authority, in NSW between the Rural Fire Service and the Department of Environment & Conservation, and in WA between the Department of Environment and Conservation and the Fire and Emergency Services Authority.

The results of the audit revealed differences between jurisdictions in relation to both AIIMS and non-AIIMS symbols. In addition to the physical differences in symbology, the audit process revealed a number of differences in terminology or definition associated with symbols. “There were significant variations between agencies such as local government, search and rescue, police, health and environmental agencies on the definition of features such as ‘staging areas’, ‘control areas’ and

'control points'. These differences in definitions impact the ability to create usable map based products for use in multi agency incidents."[4]

The Australasian All Hazards Symbology project also reviewed the international approach to standardised emergency management mapping symbology. The United States Federal Geographic Data Committee (FGDC) recognised the need for the use of standardised emergency management symbology and created the FGDC Homeland Security Symbology sub group.

Although the specific symbols within the US Homeland Security symbology library have been designed for use within the US, there are a number of characteristics of the symbology set which are of interest to other jurisdictions. These characteristics include:

• Defined categories that are differentiated by frame shapes. Diamonds, circles and rectangles are used to visually classify the symbols into their respective groups (Incidents & Natural Events, Operations and Infrastructures respectively).

• Border patterns to provide further information on a symbol level (dashed and solid lines).

• Designed for use in digital and paper map products.

• Designed to work across a range of (but not all) scales.

• Designed for use both in black and white and colour (eg. while a coloured symbol frame can be used, the pattern of this frame also denotes the level of damage or operational status).

Based on the stakeholder workshops, the Australasian All Hazards Symbology report recommended eighty one (81) emergency management symbols defined within an extensible framework incorporating the features of both AIIMS and the FGDC.

The extensible symbology framework is characterised by:

• Three categories: Incidents, Operations and Assets;

• Status of a feature: eg. planned / completed; and

• Definition for every feature (symbol).

It should be noted that at the beginning of the Australasian All Hazards Symbology project, New Zealand was already well advanced and had begun a proof of concept trial of a standardised All Hazards symbology set based on the FGDC symbol set.

In the initial trialling of the FGDC and New Zealand symbols, the overwhelming feedback received by EMSINA from Australian emergency management agencies was that some of the FGDC and New Zealand symbols, while intuitive, did not suit large-scale emergency events covering a large geographic extent. In these situations the symbols overtook the map or, if reduced in size, became illegible.

Further details of the New Zealand initiative can be found on page 22 of the Australasian All Hazards Symbology report.

[4] ICSM (2007) *Australasian All-Hazards Symbology Project: Project Report*, p.5. Available at: http://www.icsm.gov.au

EMSINA All Hazards Symbology Project: 2008 - 2010

Following the finalisation and publication of the Australasian All Hazards Symbology report in May 2007, EMSINA developed and managed the EMSINA ALL Hazards Symbology project to test the proposed Australasian All Hazards symbology framework and symbol set within the various spatial information applications and systems used within their agencies.

The trial was conducted in consultation with ANZLIC, AFAC, ICSM and NSIM. EMSINA state representatives were responsible for the identification of the stakeholders, providing briefing information, presentations and sample data. A symbology resource kit which included the symbols and a testing feedback proforma was made available to the testing agencies via the ANZLIC website and promoted via the AFAC Knowledge Web.

The testing was to be undertaken by the agencies either in routine activities or exercise environments. The responses were subsequently collated for analysis by EMSINA.

Summary of Testing Results

At the conclusion of the testing period a total of 19 responses were received from the participating agencies comprising Fire (5), SES (4), Police (1), Ambulance (1), Primary Industry/Agriculture and Environment (5) and General Emergency Management agencies[5] (3).

The jurisdictional breakdown of responses received comprised Australian Government agency (1), Tasmania (3), ACT (3), Queensland (2), NSW (2), South Australia (6), and Western Australia (2).

Additional feedback was received from a number of federal and jurisdictional emergency management agencies that did not submit formal feedback forms but who were well involved in the project.

At the November 2009 EMSINA meeting, the symbols were categorised into generic emergency management[6] and hazard specific groups (e.g. Fire, SES, Biosecurity and Police for focussed revision among relevant agencies). This was an important part of the review process as it provided the forum for cross-jurisdictional and hazard specific agency discussion and resolution of symbol differences.

Following the hazard specific review, all individual symbol groups were reviewed to ensure there was no duplication or ambiguity of symbols across sectors that could potentially cause confusion and misinterpretation.

Throughout the testing and review process the requirement for a nationally agreed All Hazards symbology set and symbology framework was evident.

[5] Emergency Management Queensland, ACT Emergency Services Authority, Tasmania Emergency Services GIS.

[6] Generic emergency management symbols refer to symbols that are applicable for multiple hazard types and are utilised by different emergency management agencies. Examples include Road Closure, Staging Area, Control Centre and Assembly Area.

Recommended All Hazards Symbology Framework and Symbol Set

As a result of this extensive body of work EMSINA recommends the following:

1. The implementation of a symbology framework that is defined by three (3) major parameters:
   - Categories – defined by symbol shape;
   - Status – defined by line style; and
   - Definition.

The following table describes the recommended categories versus those developed by AIIMS and the FGDC.

Recommended Symbol Shape & Category	**Recommended Definition**	**FGDC**	**AIIMS**
Incidents	Relevant to incidents for any hazards including natural event, civil activities and policing	Incidents	Strategic
Operations	Relevant to planned and operational responses to events and incidents including supporting intelligence	Operations	Command Control Coordination
Assets	Assets or infrastructure that are relevant to an incident or event or operational response; assets at risk, or infrastructure that needs protection	Infrastructure	Logistics
		Natural Events	Assets to be protected

2. The implementation of a standard set of symbols for emergency management across Australia as detailed in Appendix A:

   Section 1 – Forty eight (48) General Emergency Management Symbols

   Section 2 – Twenty (20) Bushfire Specific Symbols

   Section 3 – Eight (8) SES Specific Symbols

3. Definitions be agreed to by the appropriate emergency management peak sector bodies and applied to the undefined symbols detailed in Appendix A of this report.

Issues

Interoperability

The term interoperability commonly refers to the ability of two or more systems to exchange and use the same information. Interoperability is a fundamental consideration for emergency management agencies where it is common place for the exchange of information pertaining to business functions and operations management. The portability of symbols between applications is an important requirement of interoperability. As part of the EMSINA All Hazards Symbology Project, a beta set of the proposed symbols was developed and successfully trialled across a range of industry standard and agency specific applications.

Intra and inter jurisdiction support

Emergency events do not recognise borders, whether regional or jurisdictional. Emergency management agencies have a long history of inter jurisdictional support, be it the provision of personnel or the exchange of information. As such the adoption of standardised symbology supports the use, integration and interpretation of information in today's technology environment utilised within the emergency management sector.

The adoption and use of standardised symbology is further supported by the testimony given by Mark Garvey, GIS Manager for CFA in the Royal Commission into the Victorian Bushfires on the 23 March 2010. Part of this testimony related to the joint arrangements between the mapping teams at CFA and DSE in preparation for the 2008/2009 fire season. In his testimony, Mark Garvey highlighted the agreement between fire agencies to use the same symbols on all mapping products.

Technology change and adoption

Spatial Information systems are no longer the domain of the experts. Spatial information or the geographical representation of information is today embedded in emergency management agencies' corporate, operational management systems and public facing websites. The acceptance, adoption and use of standardised symbology is now a necessity for use within and across these applications.

An example of this is a new use of real time government data in public information by the NSW Rural Fire Service. This is a geolocated RSS (GeoRSS) feed of all fire incidents and related public warnings in NSW. The feed is available from the RFS website as a map, as an iPhone application or as a data feed. The representation of incidents on the RFS map is as per the draft All Hazards symbology, coloured by emergency warning system status (as shown below). The feed is currently picked up by other NSW agencies, more than ten internet services and traditional news services. There is a need to establish national consistent symbology so that the public receives a consistent message from these services.

NSW Rural Fire Service Representation


Emergency warning


Watch and act


Advice


Not applicable

The need to compromise

With the exception of a limited set of AIIMS, USAR and Defence mapping symbols, there is currently no nationally endorsed All Hazards emergency management symbology set and framework available for use within Australia. The requirement and demand for a nationally endorsed All Hazards emergency management symbology set and framework will continue to grow. Without a symbology set and framework in place agencies will continue to develop their own in isolation.

Through the life of this project the need to compromise has been an essential requirement. This is demonstrated by the same symbol being used to represent a vaccinated property (by the animal and plant biosecurity agencies) as that used for the location of victims (by the Fire, Police and Search and Rescue agencies). In this case, the Department of Agriculture Fisheries and Forestry (DAFF), as national coordination agency for animal, plant health and pest incursions, agreed to amend their symbology and adopt the recommended symbology framework outlined in this report. DAFF have also applied the framework for use within the BioSIRT (Biosecurity Surveillance Incident Response and Tracing) application. BioSIRT enables information such as location of disease detection to be quickly exchanged between jurisdictions to facilitate a coordinated response with national consistency in recording, reporting and managing emergency incidents. Biosecurity symbols are standardised nationally through this application.

It should be noted that the particular example detailed above was not an isolated instance. There were a number of symbol conflicts across same sector emergency management agencies and across emergency management sectors. Through a de-confliction process managed by EMSINA, including the undertaking of tactical reviews of event specific symbols, compromises were reached enabling the recommendation of the attached All Hazards symbology set.

The adoption of a nationally agreed All Hazards symbol set will require strategic and technological changes and will necessitate changing of attitudes and behaviours of personnel. However, the benefits to be gained are greatly outweighed by the compromises required.

Symbology framework adoption and expandability

The adoption of the recommended All Hazards symbology framework has implications for existing symbology frameworks, including the AIIMS symbology framework for emergency management agencies. The implications for AIIMS are discussed in further detail below. Therefore, before endorsement of the framework, it is imperative to confirm the suitability of the framework across each of the emergency management sectors.

As mentioned above, the Department of Agriculture Fisheries and Forestry have been actively engaged in the EMSINA ALL Hazards symbology project. A set of animal and plant Biosecurity symbols have been produced and applied to the recommended symbology framework. Both the symbols and symbology framework have been endorsed by the National BioSIRT Standards Committee and are to be considered for formal endorsement by the Biosecurity Emergency Preparedness Working Group.

On 20 April 2010 a NSIM Symbology Sub Group workshop was held to define and develop a National set of Police Operational Counter Terrorism symbols. This workshop was attended by Senior Police Officers from across Australia who represented each of the National Counter Terrorism Committee (NCTC) Capabilities. The workshop resulted in the identification of mapping symbols required for

operational use. The recommended All Hazards symbology framework was presented to the group with in principal agreement for its adoption. The outcome of the workshop will be the development of an Operational Counter Terrorism symbol set utilising the All Hazards symbology framework for testing review and future endorsement.

These results demonstrate that the recommended All Hazards symbology framework can be expanded to meet future requirements. Where a new symbol requirement is identified, it is a simple process of agreeing on an appropriate symbol shape and its definition for inclusion into the symbology framework.

Implications for AIIMS

"AIIMS is a robust Incident Management System that will enable the seamless integration of activities and resources of multiple agencies when applied to the resolution of any emergency situation. It operates effectively for any type of incident, imminent or actual, natural, industrial or civil, and many other situations in which emergency management organisations are involved.

AIIMS has been adopted by all of the Australian Fire and Land Management agencies and the Australian Council of State Emergency Services. A number of other public safety agencies and non-emergency services have adopted AIIMS and are in the process of implementing the System within their organisations"[7].

AIIMS has a symbology framework and a limited set of mapping symbols mostly aimed at bushfire response as detailed in Appendix C. The Australasian All Hazards symbology project review found that only 62% of emergency management agencies were using the AIIMS symbols and that these agencies needed to expand the symbol set beyond its current range.

In considering the endorsement and adoption of the All Hazards symbology set, AFAC will require the modification of the existing symbology framework to that proposed by EMSINA. EMSINA has made every effort to ensure the existing AIIMS symbols remain unchanged where these symbols could be applied within the recommended framework. Existing AIIMS symbols are identified in Attachment 1 as part of the recommended symbology set, with details as to whether the AIIMS symbols are unchanged or modified.

Definitions

An important issue arising from the Australasian All Hazards symbology project was that there were significant variations between emergency management agencies on the definitions of symbols including 'staging areas', 'control areas' and 'control points'. The project report further highlighted that these differences in definitions impact the ability to create usable map based products for use in multi agency incidents.

It should be noted that a number of symbols proposed by EMSINA in Appendix A of this report do not contain an authoritative definition. These symbols have been identified as a requirement for use by emergency management agencies. While the definition of the symbol may seem obvious, unless an authoritative definition is agreed to and applied to the symbols by the emergency management peak sector bodies, there is still the possibility of differences in the definition of the symbols proposed by EMSINA being applied by emergency management agencies.

[7] From the foreword of: The Australasian Inter-Service Incident Management System 3rd Edition 2005

EMSINA recommends that definitions be agreed to by the appropriate emergency management peak sector bodies and applied to the undefined symbols detailed in Appendix A of this report.

Governance and custodianship

Broad adoption of a standard Australian All Hazards symbology set will require clear and dedicated governance arrangements. Within Australia there is no system or authorised body in place to manage the authorisation and management of standard mapping symbology across the many and varied sectors that utilise mapping symbology in paper or electronic forms.

Although this issue was raised in the Australasian All Hazards Symbology report, progress in implementing appropriate governance arrangements has been protracted. A report was recently commissioned by the National Spatial and Information Management working group (NSIM) regarding this issue and submitted to the ANZLIC Council for consideration at its March 2010 meeting. It is proposed that a working group with representatives from ICSM, ANZLIC, Geoscience Australia, Australian Attorney Generals Department and EMSINA will be convened to progress this matter.

However, the fact that such governance arrangements are not currently in place should not stop the consideration for adoption of the All Hazards symbology set by appropriate peak bodies within the emergency management sector.

There will also be the need to add symbols through a regular review process. It is expected that the various emergency management peak bodies will have a role in both identifying future symbology requirements and ratifying new symbols submitted for consideration. For example, within Queensland there have been two major oil spill incidents in the space of twelve months. These incidents have required suitable mapping symbols to support coordination of the response and recovery processes.

In regards to the publication and access to endorsed Emergency Management symbol sets, EMSINA has facilitated the housing of the symbology set on the ANZLIC website, where they will be available for download. This will enable AFAC and other organisations to provide links directly to the symbology sets and a feedback mechanism for enquiries and additional information.

Conclusion

As noted throughout this report there are significant benefits to be gained from adopting a standard set of All Hazards symbols for the purposes of emergency management within Australia. This report has also highlighted some of the issues that need to be addressed in implementing such a set of emergency management mapping symbols, including change management, the need to compromise and the implementation of appropriate governance arrangements.

This report has also highlighted the changed environment in which emergency managers and emergency management agencies now operate. Emergency managers and emergency management organisations are increasingly exposed to enquiries and public scrutiny regarding their performance during times of disaster. The increasing role and adoption of spatial information systems and their ability to record, display and exchange information within and across agencies and jurisdictions requires appropriate consideration of how best that information can be authoritatively and consistently displayed, exchanged and interpreted.

The development of an Australian All Hazards symbology set and framework that allows for expansion has been a long and extensive process. It has seen support and cooperation from all levels of government, between the emergency management agencies and jurisdictions.

It is respectfully submitted that the Emergency Management sector peak bodies consider this report and endorse and adopt the All Hazards symbology framework and the implementation of a standard set of symbols for emergency management across Australia as detailed in Appendix A as part of their emergency management arrangements.

ALL HAZARDS SYMBOLOGY

Section 1 - GENERAL EMERGENCY MANAGEMENT SYMBOLS

Note : Existing symbol font is ICS Fire Symbols 1.1 24 point unless otherwise stated, Always use Bold and Halo

◇ Incident □ Operations ○ Asset

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
1.1	General Incident	General	Point		**Unconfirmed**	Any unplanned event requiring emergency intervention (AIIMS).	Label with Location; Name; DTG; Use at Event/Incident to Jurisdictional levels eg. aircraft crash.	New	
					**Confirmed**				
1.2	Air Incident	General	Point			Occurrences during the operation of an aircraft in which any person involved suffers death or serious injury or in which the aircraft receives substantial damage (EMA).		New	
1.3	Landslide	General	Point			A landslide is the movement of rock, debris or earth down a slope. They result from the failure of the materials which make up the hill slope and are driven by the force of gravity. Landslides are known also as landslips, slumps or slope failure (Geoscience Australia)		New	
1.4	Marine Incident	General	Point			Occurrences during the operation of a boat or ship in which any person involved suffers death or serious injury or in which the boat or ship receives substantial damage (modification of EMA Air Incident definition).		New	

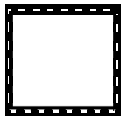
ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
1.5	Rail Incident	General	Point			Occurrences during the operation of a train in which any person involved suffers death or serious injury or in which the train receives substantial damage (modification of EMA Air Incident definition).		New	
1.7	Storm Surge	General	Point			The difference between the actual water level under influence of a meteorological disturbance (storm tide) and the level which would have been attained in the absence of the meteorological disturbance (i.e. astronomical tide) (WMO).		New	
1.8	Thunderstorm	General	Point			Sudden electrical discharges manifested by a flash of light (lightning) and a sharp or rumbling sound (thunder) (WMO). Often accompanied by squalls and/or precipitation (Rain and/or Hail)" (BoM Weather Service Handbook 1992).		New	

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
1.9	Tropical Cyclone	General	Point			Tropical cyclones are intense low pressure systems which form over warm ocean waters at low latitudes. Tropical cyclones are associated with strong winds, torrential rain and storm surges (in coastal areas) (BoM).		New	
1.10	Tsunami	General	Point			A tsunami is a series of ocean waves with very long wavelengths (typically hundreds of kilometres) caused by large-scale disturbances of the ocean (BoM).		New	
1.11	Vehicle Incident	General	Point			Occurrences during the operation of a wheeled or tracked vehicle in which any person involved suffers death or serious injury or in which the vehicle receives substantial damage (modification of EMA Air Incident definition).		New	

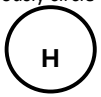
ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
1.12	**General Assets**	General	Point			Anything valued by people which includes houses, crops, forests and, in many cases, the environment (AFAC).		Modified	AIIMS had structure shown as a solid black shape. Open rectangle caters for different types of assets.
					Potentially Defendable	The status of the asset is defined by the judged ability to counter the known threat of an active incident.		Modified	Included inside asset symbol with colour changed to black.
					Defendable			Modified	Included inside asset symbol with colour changed to black.
					Not Defendable			Modified	Included inside asset symbol with colour changed to black.
1.13	HAZMAT	General	Point			Storage location of substances or materials which has been determined by an appropriate authority to be capable of posing an unreasonable risk to health, safety and property.		New	
1.14	Historic Site	General	Point			Site of historical significance that emergency responders need to be aware of to minimise impact.		New	
1.15	Indigenous Site	General	Point			Site of Indigenous artifacts or cultural importance that emergency responders need to be aware of to minimise impact.		New	

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
1.16	Significant Flora	General	Point			Site of significant flora that emergency responders need to be aware of to minimise impact.		New	
1.17	Significant Fauna	General	Point			Site of significant fauna that emergency responders need to be aware of to minimise impact.		New	
1.18	Threatened Asset	General	Point			Asset identified at risk of being destroyed or significantly damaged by a hazard.		Modified	Previously Sensitive Asset and Machine Sensitive Asset shown as circle with either S or MS respectively.

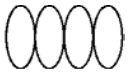
ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
1.19	Access point	General	Point			Undefined		New	
1.20	Airbase	General	Point	 Or 		Undefined		New	
1.21	Animal Shelter	General	Point			Undefined		New	
1.22	Area of Interest	General	Polygon			The extent and location anticipated at being at risk from a particular incident or event. Syn: Area of Concern	Generic AIIMS - Acknowledge issues with wildfire burnt area. Mandatory labelling required if conflict exists.	Modified	Previously Area Marker in AIIMS with colour grey. Colour & direction to be reviewed pending Tactical Review and Biosecurity Symbology.
1.23	Assembly Area	General	Point			A designated location used for the assembly of emergency-affected persons. The area may also incorporate an emergency relief centre (EMA).		Existing	
1.24	Base Camp	General	Point			A location where personnel are accommodated and fed for a period of time. A base camp usually contains catering, ablution and accommodation facilities, a water supply and a lighting system, and may include other facilities such as car parking maintenance and servicing (AIIMS).		New	

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
1.25	Control Area	General	Polygon			A declared area in which defined movement conditions apply .	Generic AIIMS - Acknowledge issues with wildfire burnt area. Mandatory labelling required if conflict exists.	New	Reviewed with Biosecurity symbology. Biosecurity symbology further defines restricted area, control area and other types of declared areas which control movement into, out of and within.
1.26	Control Centre	General	Point			The location where the Incident Controller and various members of the Incident Management Team provide overall direction of response activities (AFAC).		Existing	
1.27	Control/ Operations Point	General	Point			The location from which the overall field operations are commanded by the Operations Officer (AIIMS).		Existing	
1.28	Declaration Area	General	Polygon			Undefined		New	
1.29	Divisional Boundary	General	Point			Division: A portion of the incident comprising of two or more sectors. The number of sectors grouped in a Division should be such as to ensure effective direction and control of operations. Divisions are generally identified by a local geographic name (AFAC).		Existing	
1.30	Divisional Command	General	Point			Location at an incident from which the Division Commander of that division operates (AIIMS).		New	

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
1.31	Drop Zone	General	Point			Target area for airtankers, helitankers, or cargo dropping (AFAC).		New	
1.32	Emergency Alert Warning Area	General	Polygon			Undefined	Generic AIIMS - propose solid fill as with National Standard. Transparency as required.	New	
1.33	Evacuation/ Escape Route	General	Line			A planned route away from danger areas at a hazard (AFAC modified).		New	
1.34			Point		Established			New	
					Planned			New	
1.35	Evacuation Area	General	Point		Established	Areas surrounding an emergency incident in which personnel and/or residents may be subject to ready removal in case of necessity (EMA).		New	
					Planned			New	

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
1.36	Evacuation Centre	General	Point		Established	Centres that provide affected people with basic human needs including accommodation, food and water (EMA).		New	
					Planned			New	
1.37	Helibase	General	Point	 OR 		A location for parking, refuelling and maintenance of helicopters operating in support of an incident (AFAC).		Modified	Previously circle with H  AFAC Glossary uses HB as abbreviation.
1.38	Helipad	General	Point			A designated location which meets specific requirements for a helicopter to take off and land.		Modified	Previously circle with dot (Remote Helipad)  AFAC Glossary uses HP as abbreviation.
1.39	Location - Fire Appliance	General	Point			The location of any motor vehicles that carry firefighters and equipment (TBC).		New	
1.40	Location - Ambulance	General	Point			Undefined		New	

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
1.41	Location - Police vehicle	General	Point			Undefined		New	
1.42	Location -SES vehicle	General	Point			Undefined		New	
21.43	Medical	General	Point			Undefined		New	
1.44	Mobile Weather Station		Point			Often referred to as Portable Automatic Weather Stations (BoM).			
1.45	Refuge Area	General	Point			Areas where people may seek shelter from the danger of fire (modified EMA).		Existing	
1.46	Road Closure Traffic Control Point	General	Point		Active	Road check point or barricade to maintain compliance with movement control restrictions (AEM_Glossary).		New	
					Planned				

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
1.47	Sector Boundary	General	Line			Sector: A specific area of an incident which is under the control of a Sector Commander who is supervising a number of crews (AFAC).		Existing	
1.48	Sector Command	General	Point			Undefined		New	
1.49	Staging Area	General	Point			A prearranged, strategically placed area where support response personnel, vehicles and other equipment can be held in readiness for use during an emergency (EMA).		Existing	

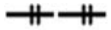
Section 2 - BUSHFIRE SPECIFIC SYMBOLS

Note : Existing symbol font is ICS Fire Symbols 1.1 24 point unless otherwise stated, Always use Bold and Halo

Asset Operations Incident

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
2.1	Fire	Fire	Point		**Emergency Warning**	An unplanned vegetation fire. A generic term which includes grass fires, forest fires and scrub fires (AFAC).		New	
2.2		Fire	Point		**Watch and Act**			New	
2.3		Fire	Point		**Advice**			New	
2.4	Fire - Point of Origin	Fire	Point		Confirmed	The specific location where the fire started (AFAC).	Label with Location; Name; DTG;	Modified	Previously Black circle with X. 
					Unconfirmed			New	
2.5	Fire Hot Spot	Fire	Point			1. A particularly active part of a fire. 2. An area of smouldering fuels requiring to be extinguished during patrol operations (AFAC).	Label with Location; Name; DTG;	Modified	Previously red 5 pointed star.

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	1. Definition (Source)	Guidelines and Examples	AIIMS	Comments
2.6	Spot Fire	Fire	Point			2. Isolated fire started ahead of the main fire by sparks, embers or other ignited material, sometimes to a distance of several kilometres. 3. A very small fire that requires little time or effort to extinguish (AFAC).	Label with Location; Name; DTG;	Modified	Added circle around symbol.
2.7	Fire Direction	Fire	Point			Undefined	Label with Location; Name; DTG;	Modified	Previously black arrow without text.
2.8	Burnt Area	Fire	Polygon		Current Burnt Area	Area comprehensively burnt by recent fire activity (EMSINA).	Label with Location; Name; DTG;	Modified	Changed to oblique pattern.
					Previous Burn	Area comprehensively burnt by previous fire activity (EMSINA).	Label with Location; Name; DTG;	New	Can be colour coded to differentiate year of burn.
2.9	Fire Edge	Fire	Line		Predicted	The predicted spread by the application of fire spread models utilising appropriate inputs of fuel conditions, topography and weather.	Label with Location; Name; DTG;	Modified	Previously dashed black line.
			Line		Active	Any part of the boundary of a going fire at a given time. NOTE: The entire boundary is termed the 'fire perimeter'.		Modified	Previously solid red line.
			Line		Contained	The status of a wildfire suppression action signifying that a control line has been completed around the fire, and any associated spot fires, which can reasonably be expected to stop the fire's spread (NWCG).		New	
2.10	Aerial Ignition	Fire	Line		Completed	Ignition of fuels by dropping incendiary devices or materials from aircraft. (AFAC)	Label with Location; Name; DTG;	New	Added circle around symbol and modified from point to line symbol.
			Line		Planned			Modified	

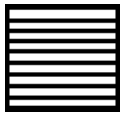
ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
2.11	Back Burn	Fire	Line		Planned	A fire started intentionally along the inner edge of a fireline during indirect attack operations to consume fuel in the path of a bushfire (AFAC).	Label with Location; Name; DTG;	Modified	Previously shown as solid line.
					Completed			New	
2.12	Fire Control Line	Fire	Line	X-X-X-X	Planned	A natural or constructed barrier, or treated fire edge, used in fire suppression and prescribed burning to limit the spread of fire (AFAC).	Label with Location; Name; DTG;	Modified	Previously thin black line.
				XXXXXX	Completed			Modified	Previously thick black line.
2.13	Machine Cut Track	Fire	Line		NA	Undefined	Label with Location; Name; DTG;	Existing	
2.14	Water Point	Fire	Point		NA	Natural or artificial water storage of value in fire operations. Generally indicated by a signpost.		Existing	
2.15	Water Point Helicopter	Fire	Point		NA	Undefined		Existing	
2.16	Water point Vehicle	Fire	Point		NA	Undefined		New	
2.17	Hydrant	Fire	Point		NA	Water source connected to a water main with a valve to which a hose can be attached (TBC).		New	
2.18	Plant Machinery	Fire	Point		NA	Undefined		New	

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
2.19	Remote Access Fire Team	Fire	Point		NA	Undefined		New	
2.20	Portable Communications Installation	Fire	Point			Undefined		Modified	Modified description from “Portable Radio Repeater” and added circle around symbol.

Section 3 - SES SPECIFIC SYMBOLS

Note : Existing symbol font is ICS Fire Symbols 1.1 24 point unless otherwise stated, Always use Bold and Halo

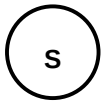
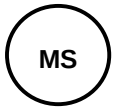
Asset Operations Incident

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
3.1	Flood	General	Point			The overflowing by water of the normal confines of a stream or other body of water, or the accumulation of water by drainage over areas which are not normally submerged (WMO).		New	
3.2	Temporary Levee	SES	Line			Levee: Temporary measures used to confine streamflow within a specified area along the stream or to prevent flooding due to waves or tides (NSW SES – EMA modified).		New	
3.3	Flooded Area	SES	Polygon		Confirmed	That area of the floodplain covered by flood waters during the defined flood event (EMA).		New	
					Predicted/Unconfirmed			New	
3.4	Flood Affected Property	SES	Point		Confirmed Unconfirmed	Undefined		New	
3.5	Flood Affected Livestock	SES	Point		Confirmed Unconfirmed	Undefined		New	TBC by Biosecurity review. Possibly move to General AIIMS as 'Affected Livestock'.

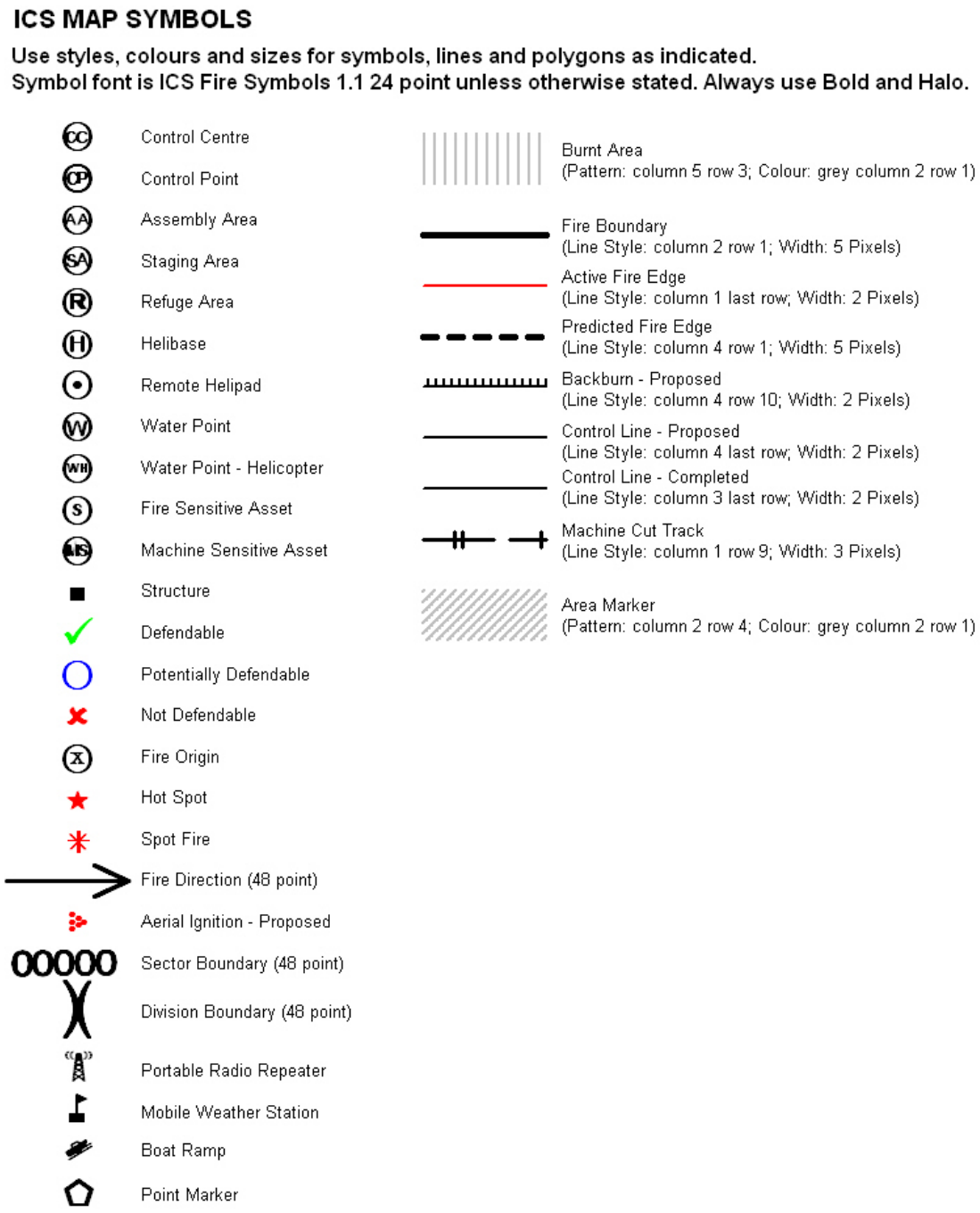
ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
3.6	Flood Rescue Boat	SES	Point		Confirmed Unconfirmed	Undefined		New	
3.7	Storm Affected Property	SES	Point		Confirmed Unconfirmed	Undefined		New	
3.8	Tree Down	SES	Point		Confirmed Unconfirmed	Undefined		New	

Appendix B

Existing AIIMS Symbols Not Used

ID	Symbol (feature)	Theme	Geometry	System Symbol	Status	Definition (Source)	Guidelines and Examples	AIIMS	Comments
	Boat Ramp		Point						
	Fire Boundary		Line						
	Fire Sensitive Area		Point						
	Machine Sensitive Asset		Point						
	Point Marker		Point						

AIIMS ICS MAPPING SYMBOLS



* The above symbols are AIIMS ICS 2.1 with additional symbols which have been broadly adopted and attributed to AIIMS ICS.