

NDMP Data Dictionary Project

Reference Guide of Phase 1

Attachment 2: Comparative Gap Analysis

Also available is the Summary Report of Phase 1

Report January 2010

Prepared by the Australian Bureau of Statistics

In accordance with the
Project Plan for the Natural Disasters Mitigation Program (NDMP) of
Natural Disasters Project

**For presentation to
The Advisory Group and Steering Committee for approval.**

The NSW Fire Brigade (NSWFB) is the Sponsor of the Contract Material.

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The Reference Guide of Phase 1 also contains

Attachments

Attachment 1 Environmental Scan/Literature Review
Attachment 3 Draft Data Model

Appendices

Appendix A Abbreviations and symbols

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Appendix E Second UK example

1.0 Introduction

The comparative gap analysis was undertaken in consultation with the Advisory Group representatives to capture agency Prevention, Preparedness, Response and Recovery (PPRR) activities across all jurisdictions (Section 2). Section 3 identifies agencies' aspirational data categories and items for inclusion in the proposed data model. Verification of the value of retaining current data categories and items, and identifying unnecessary or inappropriate data categories or items that should not be included in the proposed data model is included in Section 4. Section 5 identifies commonalities and differences in activity collection and recording systems while Section 6 identifies commonalities and differences in definitions, standards and classifications used in various systems. Advisory Group and Steering Committee members are asked to advise the ABS Project Team of any errors or omissions within the document.

The level of detail for the comparative gap analysis was limited by the level of detail in the information provided by the key agencies, particularly in regard to organisations' end to end information requirements. As a consequence, contextual information supporting the technical schemas was often lacking, particularly for legacy systems. Therefore, one to one comparisons of each organisation were difficult and it has not been possible to provide a table highlighting the specific data elements and the differences in the information collected between agencies. Using the information provided, the ABS has attempted to classify information under PPRR from various sources. During the consultations with Advisory Group and Steering Committee members, these lists can be extended or changed as necessary and a new list from the consultation phase can be placed as an additional appendix. To gain a full list, it was felt by some agencies that more time was needed to gather this information, as it is not extractable from documentation held in the agency.

2.0 Capture Agency PPRR activities across all jurisdictions

2.1 Differences in concept of PPRR

2.1.1 NSW State Emergency Service (SES)

Source: State and Territory Emergency Service National Performance Indicators.

NSW SES uses Emergency Management Australia (EMA)'s definitions for PPRR and have roles and tasks specified in legislation, plans or other instructions.

2.1.2 NSW Fire Brigade (NSWFB)

For different purposes the NSWFB draws definitions for PPRR from the following sources:

EMA provides developed and nationally agreed Concepts and Principles, Glossary and Thesaurus used across the emergency management sector including the NSWFB. The concepts, principles and terms are likely to be used by the sector, but not those relating to specific areas of particular emergency services. Refer to EMA website for Concepts and Principles, Glossary and Thesaurus.

NSW Arrangements

a) State Emergency and Rescue Management Act 1989 defines an "emergency" and the "stages of emergency".

The Act also contains definitions of:

Accredited rescue unit;
Agency;
Combat agency;
Control coordination;
Displan;

District;
District Emergency Management Committee;
Emergency operations centre;
Emergency services organisation;
Functional area;
Government agency;
Local Emergency Management Committee;
Local Government Area;
Non-government agency;
Recovery agency;
Rescue;
State Disasters Council;
State Emergency Management Committee;
State Emergency Operations Controller;
State Emergency Recovery Controller;
State of emergency; and
State Rescue Board.

b) NSW State Disaster Plan

The State Disaster Plan contains definitions. The definitions used in this Plan are sourced from The State Emergency and Rescue Management Act.

c) State Rescue Policy

The State Rescue Policy contains definitions rescue and rescue functions and services. The definitions used in this Plan are sourced from The State Emergency and Rescue Management Act.

2.1.3 NSW Rural Fire Service (RFS)

NSW RFS on the other hand address the four facets of PPRR by appropriate programs and tasks, ensuring that the activities of PPRR have measurable outcomes. They also ensure that the RFS has allocated, and best uses its resources to mitigate the risks of bush fire and other natural disasters. One area of difference is that NSW RFS use the word Planning rather than Preparedness.

2.1.4 Country Fire Authority (CFA)

CFA uses the definition used by the Productivity Commission Report on Government Services (ROGS). PPRR is further broken down in CFA's Output Model to subordinate programs, and then to component products and services delivered. The Strategic Planning and Area Coordination Directorate (SPAC) is the principle corporate reporting entity. Organisational performance reports to or from external agencies are coordinated through SPAC, with some exceptions. The key role is to support CFA Areas and development of business strategy. SPAC provides analysis of PPRR data to investigate organisational trends and issues.

2.1.5 Queensland Fire and Rescue Services (QFRS)

As reported by QFRS they adopt the 5R's approach which has been drawn from the PPRR approach. QFRS sees the 5R's approach as a more holistic methodology for emergency management as it emphasises the crucial role that research and information plays in ensuring the effectiveness of managing risk. QFRS does not currently structure reporting around the PPRR or 5R's framework.

2.1.6 Metropolitan Fire Brigades (MFB)

MFB define PPRR "Consistent with the definition used by the Productivity Commission's Report on Government Services". While MFB's data and performance reporting unit doesn't collect the data used for PPRR, it has access to organisational datasets so that organisational performance reports for senior management, the Board and Zones as well as external agencies can be generated.

2.2 Prevention Activities

The EMA Glossary defines "Prevention" as:

- Regulatory and physical measures to ensure that emergencies are prevented, or their effects mitigated; and
- Measures to eliminate or reduce the incidence or severity of emergencies.

(Source: EMA Glossary p89)

Activities that contribute to prevention and mitigation include:

- Advice on land management practice and planning;
- The inspection of property and buildings for hazards,
- Compliance with standards and building codes, and levels of safe practices;
- The preparation of risk assessment and emergency management plans;
- Risk categorisation for public information campaigns; and
- Public information campaigns and educational programs to promote safe practices in the community.

(Source: Report on Government Services, 2009, 9.11)

2.2.1 NSW SES

(Source: State and Territory Emergency Services (S/TES) National Performance Indicators, November 2008)

S/TES activities for Prevention are:

- Ensuring that the legislation specifies all the roles and tasks, plans or other instructions. The roles and tasks of S/TES are specified in legislation, plans or other instructions; and
- Education in that S/TES conduct public safety campaigns on their lead roles of flood, storm, cyclone and tsunami.

2.2.2 NSWFB

(Source: NSWFB Key Performance Information Reported table)

NSWFB activities for Prevention are:

- Advice on rural land management;
- Preparation of risk assessment and emergency plans;
- Inspection of property and building for fire hazards and fire standards compliance (including hospitals);
- Inspection of storage and handling;
- Smoke Alarm Battery Replacement for the Elderly (SABRE) activities;
- FireEd activities;
- Community safety programs such as SABRE, FireEd, RescuEd and hazard reductions by fire fighters; and
- Research on community safety.

2.2.3 NSW RFS

(Source: NSW Rural Fire Service Corporate Plan 2009-2012)

NSW RFS activities for Prevention are:

- Support the community to undertake their fire management activities in a more ecologically sustainable manner whilst maximising community safety;
- Undertake hazard reduction planning, and maintain reporting and recording of hazard management activities;

- Implement and monitor the number and value of properties protected by the Urban Interface Bush Fire Mitigation Plan;
- To inspect properties subject to bush fire hazard complaints;
- Monitor and maintain statutory requirement for local bushfire danger periods;
- Improve the ignition management in order to reduce the number of accidental deliberate and malicious ignitions; and
- Research and lessons learnt.

2.2.4 CFA

(Source: CFA Output Model). Not all recording had been implemented as yet against this model.

CFA activities for Prevention are:

- Regional fire prevention;
- Municipal fire prevention;
- Wildfire prevention;
- Structural fire protection;
- Dangerous goods;
- Land use planning;
- Policy and guidelines; and
- Environmental management.

2.2.5 QFRS

(Source: Fire Service Measures report QFRS and Department of Emergency Services Corporate Plan 2007-11)

QFRS activities for Prevention are:

- Strengthen community safety by minimising risks associated with major hazard facilities and large dangerous goods storage through direct regulation and by working with other jurisdictions to improve legislation and relevant national standards;
- Partnering with the community to mitigate risks through education and fire safety activities;
- Supporting risk owners in building and infrastructure safety;
- Research and risk-based approach to planning and governance;
- Incorporation of lessons learnt from major events and disasters into planning, policy development and corporate governance arrangements;
- Research to ensure systems and policies are innovative, efficient and sustainable;
- Ensure sustainability by ensuring all aspects of operations consider communities, people and environment; and
- Business continuity planning.

2.3 Preparedness Activities

The EMA Glossary defines "Preparedness" as:

- Arrangements to ensure that, should an emergency occur, all those resources and services which are needed to cope with the effects can be efficiently mobilised and deployed; and
- Measures to ensure that, should an emergency occur, communities, resources and services are capable of coping with the effects.

(Source: EMA Glossary p88)

Activities that contribute to preparedness include:

- Public education and training;

- Emergency detection and response planning (including the installation of smoke alarms and/or sprinklers);
 - Hazardous chemicals and material certification, and the inspection of storage and handling arrangements;
 - The exercising, training and testing of emergency service personnel;
 - Stand-by and resource deployment and maintenance; and
 - Establishing equipment standards and monitoring adherence to those standards.
- (Source: Report on Government Services, 2009, 9.11)

2.3.1 NSW SES

(Source: S/TES National Performance Indicators, November 2008)

Preparedness activities for S/TES are:

- Interoperability;
- Doctrine;
- Maintain human resource policies;
- Maintain personal information on volunteers and staff to enable them to be properly managed;
- Training;
- Ensure that S/TES are Registered Training Organisations (RTOs) or under the scope of a parent organisation;
- Operate on common training material;
- Review Australian emergency manuals;
- Ensure training resource kits;
- Equipment;
- Communication;
- Planning; and
- Assistance for municipal planning (not undertaken by ACT).

2.3.2 NSWFB

(Source: NSWFB Key Performance Information Reported table)

Preparedness activities for NSWFB are:

- Preparation of response plans;
- Public training and intervention;
- Promotion of fire alerting systems;
- Training of fire personnel (including ComSafe);
- Sale and maintenance of fire protection equipment;
- Hazardous chemicals and material certification;
- Community Fire Units established in bush/residential interface;
- Meetings and presentations;
- Review Mutual Aid Agreements;
- Media interviews conducted and public relations event attended;
- Counter-terrorism;
- Critical infrastructure protection; and
- National security support.

2.3.3 NSW RFS

(Source: NSW Rural Fire Service Corporate Plan 2009-2012)

Preparedness activities for NSW RFS are:

- Plan implement and record community education programs in accordance with bush fire risk management plans;
- Assess development application in bush fire prone areas;
- Coordinate the planning of appropriate location and type of fire trails;
- Purchase, care, use of storage of defibrillators;
- Develop fire fighting water resource plan;
- Determine urban search and rescue requirements;
- Ensure adequate aviation resources contracted for each fire season;
- Research contemporary management practices;
- Risk assessments;
- Issue of Personal Protective Equipment (PPE);
- Inspect fire fighting apparatus;
- Ensure that all equipment is maintained in serviceable condition;
- All vehicles properly identified;
- Manage the tanker replacement program;
- Replacement of all petrol to diesel appliances;
- Fit water tanks to all RFS stations;
- Complete the annual resource allocation planning system;
- Implement and maintain radio infrastructure and management arrangements;
- Implement and maintain an adequate level of radio and paging coverage across the state;
- Implement and maintain effective levels of communications technology and infrastructure;
- Develop and implement training and education program;
- Develop a strategy to upgrade the operational communications vehicles;
- Strategic planning;
- Brigade membership records maintained;
- Training and aviation training;
- Preparation of training materials;
- Development of program to attract and retain sufficient members to deliver;
- Increase participation across the service in community education activities through the development of skills and knowledge exchange for both staff and volunteers;
- Develop and implement domestic training; and
- Improvement to staff records.

2.3.4 CFA

(Source: CFA Output Model). Not all recording implemented as yet.

Preparedness activities for CFA are:

- Fire equipment maintenance;
- Emergency management planning;
- Industry protection partnerships;
- Community development programs for residential fire safety;
- Community development programs for wildfire safety;
- Community development programs for groups with special needs;
- Schools programs;
- Youth development programs;
- Public awareness activities;
- Community information and liaison (Brigade based);
- FEM management;
- FIRS management;
- Infrastructure maintenance, management & support;

- Operational coordination;
- Operational planning;
- Performance management;
- Community safety program coordination;
- Community risk analysis; and
- Learning and professional development.

2.3.5 QFRS

(Source: Fire Service Measures report QFRS and Department of Emergency Services Corporate Plan 2007-11)

Preparedness activities for QFRS are:

- In collaboration with other agencies prepare and plan for natural disaster events (particularly cyclones and tsunamis);
- Ensure appropriate disaster plans and policies are developed and in place;
- Implement amendments to the Fire and Rescue Service Act 1990 to improve building fire safety;
- Incorporate emergency and disaster mitigation strategies into land planning;
- Plan for all-hazards through multi-service initiatives;
- Participate in cross-agency exercises and resilience forums;
- Regional planning and coordination;
- Identify most vulnerable communities based on risk of storm surge and tsunami;
- Reduce community vulnerability to storm surge and tsunami threats through accelerated data collection, analysis, modelling and enhanced disaster planning;
- Enhancement of helicopter rescue infrastructure;
- Develop rapid damage assessment methodology to enhance disaster responsiveness and ensure response and recovery efforts are targeted to those most in need;
- Mitigate workplace hazards and risks to reduce workplace injuries;
- Implement policy and initiatives to enhance and support the importance of volunteerism;
- Build leadership capability; and
- Training - number of hours spent on maintenance and acquisition of skills that meet competency standards.

2.4 Response Activities

The EMA Glossary defines "Response" as:

- Actions taken in anticipation of, during, and immediately after an emergency to ensure that its effects are minimised, and that people affected are given immediate relief and support; and
- Measures taken in anticipation of, during and immediately after an emergency to ensure its effects are minimised.

(Source: EMA Glossary, p94)

Activities that contribute to response include:

- The implementation of emergency plans and procedures;
- The issuing of emergency warnings;
- The mobilisation of resources in response to emergency incidents;
- The suppression of hazards (for example, fire containment);
- The provision of immediate medical assistance and relief; and
- Search and rescue.

(Source: Report on Government Services, 2009, 9.12)

2.4.1 NSW SES

(Source: S/TES National Performance Indicators, November 2008)

Response activities for S/TES are:

- Collaboration on all aspects of S/TES operations with the ACSES formed Operations Group;
- Maintain operational management systems;
- Introduction of the AIIMS into their OMS;
- Call taking on the 132 500 number for emergency help in floods and storms;
- Communication on public information systems to enable the public quick access to their services and for them to respond in emergencies;
- Use of operating instructions for interstate deployments;
- Compatible with other emergency services as AIIMS/ ICS is implemented;
- Increasing capability of deploying interstate to support one another;
- Effective tasking with the introduction of OMS and of 132 500 the effectiveness of S/TES responses has improved;
- Support to non-government emergency service organisations;
- Storm response;
- Flood response;
- Tropical Cyclone response;
- Road rescue;
- Vertical rescue;
- Land search and rescue;
- Urban search and rescue;
- Inland marine search and rescue;
- Offshore marine search and rescue;
- Emergency service organisation support;
- Community support;
- Earthquakes;
- Tsunami response;
- Air observer;
- Civil defence;
- National security support;
- Community first response; and
- Incident management.

2.4.2 NSWFB

(Source: NSWFB Key Performance Information Reported table)

Response activities for NSWFB are:

- Structural fires suppression;
- Response to explosions;
- Landscape fires suppression;
- Taking of emergency calls;
- Wild fire suppression;
- Response to incident involving hazardous substances;
- Interagency response/incident management arrangements;
- Hazardous materials incidents;
- Chemical biological and radiological incidents;
- Aircraft/airport incident response;

- Medical emergencies first responder and support;
- Road rescue;
- Storm damage;
- Industrial rescue;
- Rescue;
- Natural disaster events;
- Marine response;
- Technological and hazardous material incidents;
- Emergency relief and recovery;
- Vertical rescue;
- Urban search and rescue; and
- Other.

2.4.3 NSW RFS

(Source: NSW Rural Fire Service Corporate Plan 2009-2012)

Response activities for NSW RFS are:

- Investigate reported fires to determine a cause;
- Record the probable cause of reported fires and determine the cause and origin of investigated fires;
- Maintain 24 hour contact for receipt of fire and related incident calls and response of brigade;
- Prepare, implement and monitor the Plan of Operations;
- Review and implement response arrangements and boundary reviews;
- Ensure that competent local volunteers are nominated for Incident management teams; and
- Implement Computer Aided Despatch (CAD).

2.4.4 CFA

(Source: CFA Output Model).

Not all recording implemented as yet. The response activities for CFA are:

- Information flow to community during emergencies;
- Emergency response – statutory;
- Emergency response – non statutory;
- False alarm management;
- Emergency management co-ordination;
- Fire fighters rest and recline; and
- Performance monitoring.

2.4.5 QFRS

(Source: Fire Service Measures report QFRS and Department of Emergency Services Corporate Plan 2007-11)

Response activities for QFRS are:

- Providing responsive structural fire services to the urban community (including false and good intent calls);
- Delivering rescue services across all hazards;
- Managing the risk and impact of landscape fires;
- Operational service summary (included the number of incidents attended, number of fires and explosions, other incidents);
- Implementation of desktop and field exercise program to strengthen response capability;

- Introduce a new generation of operational information and communication technology systems to enhance and extend capacity and capability;
- Implement improvements to CAD systems;
- Collaborate to achieve a single national incident management system; and
- Build a new Integrated Communications and State Emergency Operations Centre for more effective management of incidents.

2.5 Recovery Activities

The EMA Glossary defines "Recovery" as:

- The coordinated process of supporting emergency-affected communities in reconstruction of the physical infrastructure and restoration of emotional, social, economic and physical well-being; and
- Measures which support emergency-affected individuals and communities in the reconstruction of the physical infrastructure and restoration of emotional, economic and physical well-being.

(Source: EMA Glossary p92)

The activities are two pronged. One results in returning agencies to a state of preparedness after emergency situations. The activity results in the recovery of the affected community and individuals.

These activities include:

- Critical incident stress debriefing;
- The return of ESO's resources to the state of readiness specified in response plans;
- The restoration of essential services;
- Counselling programs;
- Temporary housing;
- Long term medical care; and
- Public health and safety information.

(Source Report on Government Services, 2009,9.12)

2.5.1 NSW SES

(Source: S/TES National Performance Indicators, November 2008)

Recovery activities for S/TES are:

- Membership of recovery committees;
- Assist emergency management organisations to conduct recovery operations;
- Provide information to local authorities and recovery agencies to assist in recovery operations;
- Review plans and operations after each event;
- Develop support programs;
- Support transition from response to recovery;
- Emergency plans are reviewed following each operation;
- Volunteers and staff have support available to deal with Critical Incident Support (CIS); and
- Deficiencies are noted during debriefing and rectified for:
 - Warnings;
 - Operations;
 - Training; and
 - Equipment.

2.5.2 NSWFB

(Source: NSWFB Key Performance Information)

Recovery activities for NSWFB are:

- Critical incident stress debriefing;
- Salvage and restoration of the emergency event to a safe state;
- Support for the community;
- Provide information for settling insurance claims; and
- Post incident analysis of events.

2.5.3 *NSW RFS*

(Source: NSW Rural Fire Service Corporate Plan 2009-2012)

A Recovery activity for NSW RFS is:

- Develop a link between NSWFB Fires 111 and RFS Post Incident reporting system.

2.5.4 *CFA*

(Source: CFA Output Model).

Recovery activities for CFA are:

- Post-Incident Analysis (PIA);
- Contribution to third party reviews;
- Statutory reporting;
- Accident investigations;
- Crisis event management;
- Incident investigations;
- Operational debriefing; and
- Fire investigation.

2.5.5 *QFRS*

No information available

The ABS Project Team would ask that all agencies review their lists and add/subtract any information so that a full list of PPRR activities can be taken out to the nation for full consultation in Phase 2 of the NDMP Project.

3.0 Identification of aspirational data categories and items for inclusion in the proposed data model

Aspirational data categories and items refer to an ideal world where emergency services can include all suggestions for future data categories and items. In consultation with NSWFB, NSW SES, NSW RFS, CFA, and QFRS, and from information delivered from other agencies and jurisdictions, many items and data categories have been mentioned. Also, information from relevant reports, papers and the internet has been included.

3.1 Interim Report of the Victorian Royal Commission on the Victorian Bushfires 2009

There are opportunities to improve the content, sources and means of disseminating bushfire information and warnings to the public and therefore the Commission's recommendations are highlighted as aspirational for all states and jurisdictions and cover the following:

- Improving the quality of bushfire information and warning messages by adopting standard language already developed for national usage;
- Simplifying the format of bushfire warnings;
- Reintroducing the Standard Emergency Warning Signal to draw attention to broadcast warnings about life threatening fires;
- Extending the broadcasting of official warnings to commercial radio and television;
- Allowing the reintroduction of sirens in local communities where there is demand for them;
- Supporting the acceleration of the full introduction of a nationally developed telephone based automatic warning system;
- Pursuing research into the development of improved fire danger index systems;
- Enhancing the role of the Bureau of Meteorology in issuing daily information on bushfire risk;
- Improving technology and processes to accelerate the updating of common bushfire information on agency websites;
- Increasing the capacity of the bushfire emergency networks, the Victorian Bushfire Information Line, Telstra's Triple Zero service and the Emergency Services Telecommunications Authority to better handle peak demands, and to work more collaboratively during severe fire risk days;
- Changes to be accompanied by an education campaign so that people understand the changes and how to interpret the information that is provided;
- Stay or Go - the emphasis of CFA community education literature and advice be changed and improved to more realistically acknowledge the risks of extremely dangerous bushfires. For those who choose to stay and defend, the risks should be spelt out more plainly, including the risk of death. People should also be encouraged to recognise that not all houses are defendable in all situations and contingencies need to be considered in case the plan to stay and defend fails. It is recommended that the CFA should have the authority to give specific advice about the defendability of individual properties and whether residents should relocate rather than trying to stay and defend. Aids for self assessment of a home's defendability should also be improved and made more readily available. For those who plan to leave, there should be more explicit advice on triggers that should be used to determine when to go. People need to have options other than the simple alternatives of 'stay' or 'go'. The experience of these fires demonstrates that a personal fire plan needs to recognise that a person's preferred option may not be possible and sometimes fails. The availability of local areas of refuge is an important and essential complement to the stay or go policy;
- Refuges - Victoria commence identifying and establishing designated community refuges, particularly in areas of high bushfire risk;
- Relocation - while there appears to be little support for compulsory evacuation, people need more guidance on whether they should plan to relocate because their house cannot be

defended, and on the ease with which they can leave safely. There was recognition that bushfire warnings in some locations should advise people to urgently leave, even with an approaching fire;

- Local government - municipal councils should have a preventative role in leading and contributing to some initiatives aimed at helping to make their communities safer and to protect people during bushfires. They should review their Municipal Emergency Management Plans to ensure that they include appropriate provision for refuges and relocations that may occur during bushfires;
- Road blocks - Victoria Police should review its guidelines on the operation of roadblocks with the aim of creating a more flexible set of procedures, particularly for local people whose bona fides can be established;
- Identifying bushfire risk - fragmented planning, including risk identification, was one of the factors that led to the development of the Integrated Fire Management Planning Framework endorsed in principle by Victoria in September 2006, but not yet implemented. The Commission endorses the concept of integrated, whole of government fire management planning. This has the potential to lead to the introduction of planning processes that make communities safer and are easier to use. This project should be given higher priority; and
- Emergency management - immediate changes are required to the State Emergency Response Plan (SERP). The SERP does not clearly designate the agency responsible for issuing warnings and recommending relocation.

3.2 Ministerial Council for Police and Emergency Management, Emergency Management Extraordinary Meeting, Communiqué, 25 September 2009

Aspirational items for noting:

- Development of a National telephony-based Emergency Warning System (NEWS) - has a Location-based Number Store (LBNS) administered by Commonwealth Attorney-Generals and a secure, central DB to hold geo-coded Integrated Public Database (IPND) data - intended to be operational end 2009;
- Enhancements to the National Registration and Inquiry System (NRIS);
- Media and education kits for the Standard Early Warning System (SEWS);
- Emergency management training programs for remote Indigenous Communities;
- Develop a national community awareness campaign on the role and value of EM volunteers
- National framework endorsed for scaled advice and warnings to the community including revised arrangements for bushfire advice and alerts, with a new danger rating of Catastrophic (Code Red);
- Triple 0 calls - report on status and feasibility of procedures for ESOs to deal with surges in demand;
- Develop a national protocol for the use of 'extreme event' recorded voice announcements to redirect non-emergency callers to alternative information sources in a crisis;
- Public awareness activities before and during a crisis to ensure the public is aware of these alternative sources of information to reduce the Triple 0 demand; and
- Commonwealth public information projects development to reduce non-emergency call loads on Triple 0 and an initiative to block mobile phone handsets of repeated non-genuine Triple 0 callers.

3.3 National Aspirations

- Use of ISO/IEC 11179 or standards based metadata;
- Use of Gov 2.0 type infrastructure for real time reporting;
- Use of Google Maps – as a backup for a national systems, e.g. Geoscience Australia's exposure database;
- Complete buy-in for project from all agencies; and

- Recording of information on national emergency events in ROGS under landscape fires (ROGS 2009, 9.72).

3.4 Agencies' Aspirations

3.4.1 Future Visions

The following information has been compiled from the responses to the general focus questions on emerging agency internal requirements, industry trends and trends that will impact on ESOs' data collection and reporting needs. While these requirements and emerging trends can often be reflected in more than one category, for the sake of simplicity they have only been included in one of the sections below.

3.4.1.1 Emerging agency internal requirements

All agencies reported that increased and more consistent performance reporting was required to align with national and state reporting requirements. These requirements would be assisted by the development of data quality frameworks (and thereby improved data quality) for current indicators and datasets. Improved data consistency, alignment and quality would better meet these current and emerging performance reporting requirements. The use of improved and more consistent data standards, definitions and classifications for the collection and reporting of activities and services within agencies and across their various system applications is both an agency and industry requirement.

The improved integration of agencies' administrative systems and the expansion of existing system interfaces to allow data to be captured either automatically or from other operational systems, including from multiple sources, would increase the availability of quality data, reduce the data entry overhead and improve the timeliness of data capture. This would enable the expansion of emergency management reporting arrangements, activities and services to reflect the breadth of services delivered by agencies for routine and non-routine events, including all activities/ services performed by operations and interactions amongst persons and organisations.

One agency has found that data warehouse development has already had a profound impact on consistency. Once fully rolled out, it will remove the tendency for individuals to maintain their own data extracts based on differing business rules and arriving at different correct answers to the same question. Data warehouse will provide a single source of truth. It should also facilitate informed decision making and delivery at all agency levels by allowing easier data access, data manipulation and presentation.

3.4.1.2 Emerging industry trends

While agencies require data collection systems that support data integrity and quality there should also be a reduced data collection burden on operational staff. One way to accomplish this is to improve and increase the capacity to collect data only once in relation to any activity or event thereby avoiding the need for multiple entries of the same information where the risk of data quality issues is increased. Ideally, this data capture would be during the actual activity or immediately afterwards. In addition, efficient collection and reporting systems should be scalable for routine events as well as non-routine or complex, multi-agency events e.g. natural disasters and major campaigns.

Storage of this information is increasingly through the application of data warehousing. There are currently performance reporting software systems and overlays that enhance and automate the reporting functions, however these do not address the underlying data integrity issues.

Nationally, agencies report moving towards a risk-based approach to facilitate funding across the PPRR spectrum, often in the absence of a complete evidence base (see below).

3.4.1.3 Emerging trends within the emergency service sector that will impact on data collection and reporting needs

A common and long standing need expressed by agencies is to introduce improved and consistent data standards, definitions and classifications across and within jurisdictions. The use of a common terminology and structure across ESOs would be of assistance in breaking down the silo mentality that currently exists.

Many agencies believe that the Royal Commission into the Victorian Bushfires will increase the focus on community outcomes flowing from service delivery. However, there is also uncertainty in the industry's ability to comprehensively and convincingly address this expectation. There may be the need to expand the reporting of community prevention and preparedness measures for all hazard types.

In parallel with the increased focus on community outcomes, there is an increasing need for agencies to capture and report demographic information to assist with the identification of vulnerable and at risk groups and "repeat clients", and to assess the effectiveness of programs and services aimed at these groups.

There is a need for all agencies to meet data gaps, including geospatial data, across PPRR and especially for prevention, preparedness and recovery activities for all hazard types.

Agencies need to prioritise and monitor the impact and delivery of activities during large scale emergencies. For this to occur, agencies require the ability to quickly and easily acquire and link both internal data e.g. planning instruments and external data to complement and support data to facilitate policy development and to support informed decision making before, during and after emergencies.

Agencies need to have the capacity to identify and report on the cost of services by service categories e.g. the cost of providing rescue services, the cost of providing hazmat services, the cost of providing services during natural disasters, etc. To facilitate this, activity based costing should be implemented to deliver the actual cost of the service delivery. Only through knowing the cost of services is it possible to start to report on the effectiveness and efficiency of PPRR programs and services. Through program evaluations and related information it will become more possible to understand the cost/benefit of the different treatment options and therefore where best to allocate investment across the PPRR spectrum to increase community safety and reduce the costs and social effects of emergencies and disasters. Understanding the treatment mix across the PPRR spectrum will enable agencies to do more with less funds through specific targeting to Prevention and Preparedness and lessening Response and Recovery.

Falling volunteer numbers is of concern and will impact on rural fire and state emergency service provision. More targeted funding as above may assist with the falling volunteer numbers in that fewer volunteers will be required to respond to natural disasters.

Finally, ESOs require information, research and data to support the development of advice and policy on the impacts of climate change on their activities and programs, and on community outcomes. The use and re-use of water is of particular importance given the drought affecting many parts of Australia.

3.4.2 S/TES Aspirations

(Source: S/TES National Performance Indicators, November 2008 and meeting with NSW SES)

Management information:

- More detailed reporting on the contribution of volunteers particularly at the more senior levels;

- Recruiting and retention statistics, including churn; and
- Ongoing scrutiny of the costs of being a volunteer.

Prevention/Mitigation:

- Measure the effectiveness of community safety information;
- Review the community profile of the SES; and
- Review the communication strategies and partnerships between S/TES and the Mitigation Authorities.

Preparedness:

- Retention - better understand the needs of volunteers through the use of surveys to identify and address gaps in existing programs;
- Equipment - better understand equipment requirements, including development of equipment lists, minimum standards and the working life of types of equipment and the timeframe for their replacement; and
- Equipment - may be beneficial to keep a record of equipment that is borrowed or used that is not SES Equipment to highlight the future requirements e.g. "Crane Type XYZ from ABC City Council").

Response:

- Public Communication Systems - measure the effectiveness of the current warning systems application to flood, storm, cyclone and tsunami operations;
- Public Communication Systems - measure the impacts of avalanche call receipt in major operations; and
- Measure the effectiveness of interstate support operations; and
- More details are required in Common Alerting Protocol (CAP) if a flood or storm is mentioned.

Recovery:

- Strengthen links with the recovery Centre; and
- Develop standard operating procedures for operations with recovery centres.

3.4.2.1 SES Aspirations for Systems

- Currently the tracking of equipment is not executed well. Although it is recorded where expensive equipment is left at a location, several reports need to be run to extract when the expiry date of the use of this equipment has lapsed. The ability to run one report instead of several would save resources;
- Place the Logistics system into a "cloud". ("Cloud" computing providers deliver common business applications online. These business applications are then accessed from a web browser. The information and software is stored on other servers.) This would improve the sharing of information. The use of the finance and asset management system SAP may provide the first stepping stone towards "cloud" to occur;
- Move human services information to SAP;
- Integration of SAP to produce an automatic supply request to the suppliers of the equipment when the equipment is out of date;
- Would like reminder to collect all equipment from the field when not needed anymore;
- Integration of SAP to enhance the exchange of Emergency Management information with other services or agencies;

- A computerised despatch centre that will handle events where more than 1 to 1 as SES has thousands to 1 event;
- No validation of training in RFA Online;
- Longevity of RFA Online;
- A changing operation model;
- Would like to see RFA Online run by volunteers;
- Interchange standard information nationally;
- Would like to see legislation changed so that SES could insist that certain areas were cleared of debris;
- More education for the public in prevention and preparedness, rather than response;
- Use social networking more to inform of SES services and use this to build the SES profile;
- Build on widgets - applications, smart devices on houses to improve broad band for SES across the nation;
- Better control of call volumes for emergencies. For example the 132 500 phone number took up to 70,000 calls at one time compared to 30,000 on 000. These statistics are for total calls. The problem is that in the June 2007 storms approximately 70,000 calls came into 132 500, of which about 40,000 were able to be answered. These turned into about 19,000 RFA's. With the 000 numbers, we can't tell if they were calls that were then made on 132 500, and again were not answered, or vice versa;
- More research of how international disasters are handled;
- Improved system for geocoding. Currently by latitude/longitude, own engine and therefore have limitations;
- Use of an Emergency Data eXchange Language (EDXL) in CAP. EDXL is high level encapsulation. Each agency to use the CAP/EDXL and receive the parts of the message set that they need. Use of structured extensible formats like CAP/EDXL saves the need to custom adapt to various proprietary CAD formats. As long as an agency uses CAP/EDXL as the messaging protocol, by using CAP/EDXL adapters, use of different CADs should not stop interoperability. Currently need to rely on phone-calls, manual workarounds;
- The 000 call information is a very small amount of information that is collected for police or fires due to standard fields in the system. The information is collected in 30 secs. For SES this means change management. SES spend 5 minutes per call as they need to have a different way for responses and triage. CAP could simplify this process; and
- To gain information instantly on qualifications of personnel to do a specific job. Training is in SES Online (people and training qualifications). SES send out people who are not qualified, but provide high supervision levels, as staff cannot get training unless a disaster has struck. This is not tracked. Only official training. To expand the information to include on the job training;
- To be linked to a CAD system.

3.4.3 NSWFB Aspirations

(Source: Answers from Questionnaire)

- Development of data quality frameworks and audits, and improved data quality for current indicators and data sets;
- Improved and consistent data standards and dictionaries, definitions for the collection and reporting of activities and services within NSWFB and across applications (e.g. definitions, data items and classification schemas for FireCad, Boss, AIRS, CARS, Fire Trac, FARMS), and across NSW emergency service organisations e.g. Rescue services and associated outcomes;
- Improved data integration e.g. HR system and activity system ;
- Review of current code sets to improve consistency, alignment and data quality to current and emerging requirements;

- Delivery of information that is easily accessed and manipulated, understood and well presented to facilitate informed decision making at all levels of the NSWFB from a single point;
- Expansion of reporting of information geographically;
- Improved and increased capacity to collect data only once in relation to any activity or event, to avoid need for multiple entries of the same information and potential data quality issues arising from this;
- Capture and collect data once during an activity and immediately afterwards;
- Expansion of reporting of emergency management arrangements, activities and services to reflect the breadth of services delivered by NSWFB for routine and non-routine events, including all activities/ services performed by operations (not just the primary one), and interactions amongst persons and organisations;
- Ability to capture data from multiple sources not just from first arriving resource;
- Capturing and reporting of demographic information to assist with the identification of vulnerable and at risk groups and “repeat clients”, and to assess the effectiveness of programs and services for these groups;
- Expansion of reporting of community prevention and preparedness measures for all hazard types;
- Capacity to identify and report on cost of services by service categories e.g. cost of providing rescue services, cost of providing hazmat services, cost of providing services during natural disasters;
- Reporting of the effectiveness and efficiency of PPRR programs and services (program evaluation);
- Currently have an interface between our Dispatch System and our AIRS response system. We also have less formal interfaces to some of our PP systems including Pre Incident Plans and hazard reduction. We would hope to extend on these interfaces such that much of the data could be captured either automatically (say from GPS) or from other operational systems (such as CAD) and brought into the PPRR data model. This would increase the data available, improve the quality of data, reduce the data entry overhead and improve the timeliness of data capture;
- Information, research, and data to support the development of advice and policy on where to best allocate investment across the PPRR spectrum to increase community safety and reduce the costs and social effects of emergencies and disasters;
- Information, research, and data to support the development of advice and policy on the impacts of climate change on emergency service organisations’ activities and programs, and on community outcomes; and
- Ability to quickly and easily acquire and link data from external parties/sources to complement and support emergency service organisations’ administrative data sets to facilitate policy development, and to support informed decision making for before, during and after emergencies e.g. prioritise and monitor impact and delivery of activities during large scale emergencies.

(Source: AIRS Review, Doll Martin Associates, April 2006)

Medium to long term:

- There should be a strategic review of the NSWFB information requirements using data and process modelling techniques to develop an information/systems architecture to support a range of medium and long term information systems decisions. The scoping for this exercise should be Activity Management across the full PPRR business function model. This should be seen as a medium to long term project with benefits being realised over a two year time frame;

- There should be an operational review of the user interface to identify a more effective data capture model. The lack of “data ownership” can be addressed by allowing specialist officers to enter the required data at the appropriate time. It would be pointless expanding the information base if the data will not be captured due to workloads and if the current data quality issues are not addressed; and
- In the context of the emerging information/system architecture there should be a review of current and planned reporting and management systems. It is strongly recommended that product purchases are evaluated against suitably comprehensive data and process models. In the longer term these can be extracted from the corporate information model. There is a risk that simply migrating disparate data from various sources into a single environment will not provide a significant improvement in reporting.

Short to medium term, as a contingency plan some or all of the following could be undertaken:

- Define a set of incremental changes to the AIRS application to enable specialist response activities to be captured – Hazmat, Rescue, Natural Hazards, etc;
- Consider operational opportunities to bring other activities into the AIRS reporting environment – pre-emptive declarations, activation of CFUs, etc;
- Develop areas within the preliminary data model in support of the above initiatives;
- Develop an interim target Data Capture Model and implement where practical; and
- Review and revise classification schemes (code sets) causing data quality issues.

(Source: Meeting with NSWFB)

- Geospatial information is required by NSWFB to attach reporting information in a 'location based service' format in, or as close as possible to, 'real-time'.
- Although HR systems are out of scope of the project, it was raised that NSWFB, much like the other agencies, would like their SAP systems to be integrated fully with operational systems dealing with logistics, asset management, remuneration, qualifications, entitlements and other benefits. Rather than having data entered at the end of each reporting period.
- Communications Centres – the aspirations for the FireCAD controllers revolve around the new version of VISION, which is an accessible browser based view into the FireCAD workflow as well as widespread adoption of the ICEMS standard for the FireCAD, to allow interoperability across other CADs, for not only other organisations but also in terms of future proofing CADs against software changes.
- GPS tracking – Liverpool and Campbelltown brigades are using GPS to track Fire Brigade vehicles, which would be very important in disaster situations. This will also allow for more accurate appraisals of how the Fire Brigade resources and appliances are responding to an incident and offer a better operational picture for controllers in large incidents.
- In NSW where an Automatic Fire Alarm (AFA) has been started, 97% of these calls have been false. (12,000 calls connected, 11,640 calls were false alarms). Although the systems are in place, human intervention will always be needed to check the situation 'on the ground' and make a judgement call as to what resources are used to meet the demand. For example, in an electrical or high storm activity, many AFAs are triggered and set off falsely. Yet human intervention is still required to reprioritise the resources. And to move the resource in the NSWFB jurisdictional areas to meet demand.

Suggestion from NSWFB: Businesses can be fined for causing too many false alarms, as Fire Brigade resources are ineffectively used. However, increasing fines may cause businesses to disengage and turn off Automatic Fire Alarms (AFAs). It is therefore suggested that extra media advertising and extra resources be used to educate businesses and households to test AFAs at certain times of the year, to try and alleviate the time taken to deal with false alarms.

- Brigades Operational Support System (BOSS) is currently used as a read only browser based viewer into FireCAD (Computer Aided Despatch) data. Because FireCAD information

is "refreshed" to BOSS every 10 minutes, BOSS can best be used to get a high level view into incident activity for NSWFB. The aspirational system VISION will allow for this viability to be brought closer to real-time and extensible across other CADs. VORTEX is currently in trial mode. One specification that is working well is that staff can now write up their own reports via browser based access. There are two modes: Read only and data entry modes.

Suggestion from NSWFB: When system goes to production this arrangement should be maintained as this allows for maximum speed while still maintaining security.

- 'Mutual Aid and Boundaries' is still an area of aspirational concern. A new system is being developed to move towards the use of GPS coordinates which identify individual property boundaries more clearly. With the current mapping aspect of the FireCAD system it is difficult to identify the boundaries for NSWFB and RFS areas. The new system will have well defined boundaries, by Latitude, Longitude and Centroid of Area. Each address that falls on a boundary will now be defined to a specific response area, either NSWFB or NSW RFS, allowing clear identification of the responsible agency to respond to the emergency. This will alleviate any issues that currently arise about the details of location such as "near the corner of" information.

3.4.4 NSW RFS Aspirations

Require better recording of the non-incident reporting activities undertaken for the Community. The AIRS codes do not allow for exact counting of the number of fire fighters at an incident. For instance, if over 100 fire fighters attend a fire the system will default to 99. NSW RFS would like to register the exact number of all fire fighters and units at the incident.

Suggestion from NSW RFS: That any new system allows for greater numbers to be recorded.

- NSW RFS would benefit from the use of a centralised incident management and operational workflow control system or even a viewer such as the new VISION system. Currently NSWFB controls the 000 number for fires, from one of the four centres. There is a manual linkage for rural fires from NSWFB. There is a dedicated 24 hour number. In the metropolitan fire brigade there is a set number of staff on duty all the time. However in RFS, until the pagers go off, the District Manager has no idea if they can turn out to the fire due to the volunteer nature of the service, and the fact that many of the volunteers work. The local Captain does have this knowledge. RFS respond by sending 2 brigades. A VISION system would allow NSW RFS more operational visibility, rather than full dependence on phone calls from FireCAD communications centre.

Suggestion from NSW RFS: NSW RFS suggest 2 terminals linked in Vision within 2 - 5 years.

- Spatially enabling the Bushfire Risk Incident Management System (BRIMS) which covers the allocation of Fire Permits, Hazard reduction, hazard complaints, fire danger, bushfire management committee, and warnings. This system also includes maps. The Community Fire Wise Program covers 140 districts (Risk Management of RFS), /approximately 40 Fire Zones. Information feeds from Local Government Council, (name changes, boundary changes), from NSW Department of Environment, Climate Change and Water (DECCW) for National Park information, and from Forests, NSW. BRIMS is used jointly with National Parks and Forests, NSW. This information sharing could be used better if enabled in real-time geospatially or through some set of 'location based services'. This could increase the visibility in certain significant changes in all non-response activities reported in BRIMS. Note the regional boundaries in this system are different to NSWFB's regional boundaries.

- For many fire rescue services, reporting information is only as good as the volunteers can provide. Volunteers are generally “more interested in wet stuff on red stuff”. Therefore being part of a general data model will help ensure that essential information only is being recorded.

3.4.5 CFA Aspirations

- Data movements in real time, (not unlike a stock exchange), to be able to make real time decisions. Currently provides a dashboard to the Directors but this information is historical;
- Metadata registry;
- A perfect method of knowing what real effect any Prevention and Preparedness activities have had on Response and Recovery activities. Expose any correlations;
- When an incident occurs, to be able to overlay a previous case study of similar characteristics, to improve all responses and the use of resources;
- Development and deployment of an Emergency Information Management System (EIMS) to upgrade and replace its existing fleet of operational applications. EIMS would provide a spatially based, open source system running on multiple fixed and mobile locations, and interfacing to a variety of external systems. Due to the significance of the potential development and implementation work, whole of emergency service sector sponsorship has been mandated before proceeding; and
- Provision of radios to all fire fighters including volunteers (currently pagers used).

3.4.6 QFRS Aspirations

- E-time sheet system will be integrated into OMS;
- Completion of GPS tracking of vehicle being integrated into ESCAD;
- More information on volunteers time spent on activities; and
- What future directions are Overseas Fire Rescue Services taking?

3.4.7 Other agencies

3.4.7.1 MFB

There were a large number of MFB Key Performance Indicators (KPIs) which were similar to those of NSWFB or could be derived from systems used. Notable omissions included:

- For prevention: per cent of building designs reviewed within legislative timeframe; number of persons hours performing community safety activities and number of person hours performing hazard reduction activities; per cent households with smoke alarms installed;
- For preparedness: number of pre-incident plans developed, reviewed and completed and per cent of LGA meetings/councils attended;
- For response: number of person hours assisting another combat agency; and
- For recovery: number of recovery pamphlets distributed; per cent of requests for information to settle insurance claims answered within 15 days.

The emerging requirements for the MFB are likely to be in the capture of data in relation to Prevention, Preparedness and Recovery. At a national level, the basic information should be on the group engaged with, the activities undertaken and the quality outcome of activities and any ongoing concerns (which would then inform future activities). It is likely that the Royal Commission will increase the focus on community outcomes flowing from service delivery.

3.4.7.2 Qld SES

The Queensland ESOs are in the process of updating their systems to enable more interoperability and provide the requisite information and functionality to undertake the 5R

activities required to ensure a safer community. No specific aspirational items apart from those mentioned with the new systems.

3.4.7.3 SA

No aspirational items mentioned.

3.4.7.4 WA - FESA

AIRS

Fire Services data currently collected is as outlined and defined in the current AIRS data dictionary. Some specific issues for consideration (gaps in data) are:

- Hazardous materials incident data - current coding has limitations and sometimes greater detail is required;
- Expansion of information to include smoke from anything other than a 'normal' fire;
- Off site impact should be considered;
- Container codes should consider illegal containers e.g. ammonia;
- Dust explosion should be a type of explosion (can cause injuries and bush fires); and
- Preventive actions coding should be considered e.g. actions to mitigate future hazards.

Aspirational datasets for Fire Investigation and Analysis include:

- Type of fire related injury (e.g. smoke inhalation, burn, shock);
- Whether first aid administered e.g. oxygen therapy, resuscitation, burn treatment;
- Whether ambulance called/whether victim went to hospital;
- Percentage of body burns sustained, severity of burn injuries (1st, 2nd or 3rd degree) and parts of body burned (e.g. head, trunk, arms, legs);
- Age of patient; and
- Actions leading up to injury e.g. smoking, sleeping, refuelling, engine maintenance, cooking, attending fire, extinguishing fire (with extinguisher, water, blanket).

Database systems for WA SES services are currently 'stand-alone' and have different levels of capability in terms of data collection and reporting. SES was using a system called EM2000 based on lotus notes platform (no longer technically supported and is very restricted in reporting capability) with the 2008-09 replacement incorporating other systems, including potentially the OIMS system developed by CFA for the Victorian SES. The intention is to link the new system into the OMS system wherever possible. Definitions for SES are based on EMA definitions wherever appropriate. Data-sets currently collected as per the national SES performance indicator project.

Aspirational data:

Level of preparedness in relation to:

- Allocated resources (equipment and appliances) to meet identified risk;
- Number of volunteers to meet risk profile; and
- Proportion of volunteers training in line with risk profile.

No information from Tasmania

Both NT and ACT provided the opportunity to contrast 'smaller' ESOs with the larger agencies such as NSWFB or QFRS. It is noteworthy that ACT continues to use spreadsheets for some of their activities recording.

3.4.8 Australasian Fire and Emergency Services Authorities Council

3.4.8.1 Landscape Fire Performance Measures

The aim of the Landscape Performance Measures project is to use existing sources for the provision of data and, specifically, the AIRS data and data standards wherever possible. However, not all AFAC member agencies have responsibility for landscape fires and also not all relevant agencies contribute to AIRS. From Table 3 p9 of the Business Rules for Landscape Fire Performance Measures, the following Australian agencies currently report to AIRS:

- FBACT;
- FBNSW, RFSNSW;
- NTFRS;
- QFRS;
- SAMFS;
- TFS;
- MFB, CFA;
- FESA; and
- ASA (Air Services Australia)

The following agencies are required to report to AIRS:

- RFS ACT;
- BNT (Bushfires Council of NT);
- CFS (SA Country Fire Service);
- FT (Forestry Tasmania);
- DSE (Vic Department of Sustainability and Environment); and
- DEC (WA Department of Environment and Conservation)

Aspirational items in relation to the framework include (reference: Data Analysis v0.2 28 January 2009)

Reduce loss of life and injury: (Note - to be collected from AIRS including fire type)

- A1: Fire Deaths per 1,000,000 persons; and
- A2: Fire Injuries per 100,000 persons.

Reduced economic loss:

- B1: the number of primary dwellings destroyed;
- B2: percentage of area of high value/high risk zones burnt by wildfire;
- B3: percentage of area of commercial plantations lost from wildfire;
- B4: number of stock killed; and
- B5: kilometres of fencing damaged.

Reduced disruption to the community and its ability to function:

- C1: Total number of hours by volunteers on wildfire suppression;

Reduced damage to the environment, heritage and cultural assets:

- D1: Number of cultural heritage sites damaged by wildfire;
- D2: Number of times the National Environmental Protection Measures standard for PM10 particulates resulting from wildfire and prescribed burns is exceeded each year in major population areas; and
- D3: Proportion of harnessed water catchments impacted by high intensity wildfire.

Number of preventable fires is reduced:

- E1: Number of deliberate ignitions; and
- E2: Number of accidental ignitions.

The community is more informed of the role of fire in the landscape and supports prescribed burning:

- F1: Percentage of community who understand the role of prescribed burning; and
- F2: Percentage of community supporting prescribed burning as a necessary act in the protection of the community.

The community is informed about the risk they face from wildfire, are prepared for wildfire, and behave appropriately when a wildfire occurs:

- G1: Percentage of households in high risk areas that have prepared in accordance with community education guidelines;
- G2: Percentage of households that understand risk and know what to do; and
- G3: Number of people that implement appropriate behaviours.

Fires are contained to as small as possible:

- H1: Percentage of fires contained to within determined standards in high value zones;
- H2: Percentage trend in median fire size in high risk / high value zones;
- H3: Percentage of specified fires not contained prior to 1000 the next day; and
- H4: The number of landscape fires reported.

Fuel reduction is maintained to within specified standards:

- I1: Percentage of target area that is treated to specified standard during prescribed burns.

These landscape performance measures are relevant to the project as it provides information on landscape fires which needs to be taken into consideration within the draft data model and subsequent data dictionary as well as considering how AIRS will be used in this process.

3.5 Aspirational items from other reports or articles (various)

- The creation of the Australian Civilian Corps could impact on Australia's response and recovery activities and resources.
- National standards for fire bunkers - Aspirational item for preparedness.
- New Centrelink technology will enable a full range of services to be delivered at disasters anywhere in the country. The Centrelink point-of-presence can be operated anywhere in Australia, using a 3G, ADSL or satellite connection and provides up to 10 staff to access the full range of Centrelink services and central servers - Aspirational item for recovery.

3.5.1 Victorian 2009 Bushfire Research Response: Final Report October 2009

Aspirational items in regard to:

- Communication;
- Community shelters;
- Importance of redirected effort into fire plans - even if you don't think you're at risk;
- Stay and go policy - leave early, also know your own limitations;
- Building and planning provisions including type of water tanks, location/protection of pumps/pipes; and
- New catastrophic warning and its implications.

Fire Behaviour:

- Spotting ahead of the main fire front played a significant role in the forward rate of spread of all the fires;
- The current fire behaviour meters under predict the forward rate of spread seen on the day; and
- Further work is required to understand the detailed progression of the fire across the landscape.

Human Behaviour

Planning and Preparedness:

- Many residents were not prepared for the severity of the February 7 bushfire;
- Many who lived in suburban locations had not planned or prepared for bushfires because they did not consider themselves at risk;
- A considerable amount of last-minute planning and preparation took place on the day; and
- There are many examples of 'weak links' in people's planning and preparation that affected their ability to implement their fire plan.

Information and Warnings:

- Agencies such as CFA and local councils had been only modestly successful in informing members of at-risk communities about effective preparation and planning for bushfires;
- Predictions in the preceding week were that Saturday 7th February was to be a day of unprecedented fire danger. There was only modest awareness of the implications of this in the community;
- The lack of timely information about developing threats to specific areas may have contributed to many people being surprised by the sudden impact of the fire; and
- Environmental clues such as smoke were important in alerting people to developing threats and in many instances prompted an active search for more information or a decision to leave or initiate defence.

Intentions and Actions:

- Half of the households interviewed reported at least one household member whose intention was to stay and defend. The perceived success of the 'stay and defend' strategy in past bushfires appears to have influenced people's intentions to stay and defend;
- A quarter of households interviewed reported at least one household member whose intention was to leave during a bushfire. Beliefs about the survivability of houses and their safety as a refuge during bushfires were paramount;
- A significant number of residents intended to wait and see what the bushfires were like before deciding whether to stay or go. These residents wanted to stay and defend their homes and properties, but were not fully committed or confident in their ability to do so in all conditions;
- Approximately 10% of interviewees had not previously considered how they would respond to a bushfire. These residents typically lived in more suburban locations and did not consider themselves to be at risk from bushfires;
- Around 45% of households reported that a household member stayed to defend. Some of those who intended to stay and defend left because of the severe conditions;
- Around 55% of the households reported that a household member left because of the fires. There appear to have been many late evacuations;
- A very small number of interviewees sheltered passively throughout the fire;
- Some of those who stayed to defend may have exposed themselves to considerable danger by moving around fire-affected areas.

Emerging Issues and Themes:

- It appears many residents endeavoured to return to their properties as soon as possible after the main fire danger had passed, for many reasons but a main driver was to check on the status of and defend property;
- Many community members regarded public buildings, ovals and emergency services facilities as safe places of refuge during a bushfire. There is some evidence of support for purpose-built community shelters in which residents can take shelter during a bushfire;
- Some of those who stayed to defend their homes and properties reported a range of factors that influenced their capacity to defend. These included heat exhaustion, dehydration, breathing difficulties, and eye irritation. A range of pre-existing medical conditions, such as asthma and arthritis, also inhibited some people's capacity to defend;
- Anecdotal evidence suggests that many of those who sheltered passively inside their homes may have done so in bathrooms (note - no fire agency in Australia advocates sheltering in bathrooms as a safe and appropriate response while sheltering in homes).

Building and Planning

Results of over 1,000 homes surveyed:

- Active defence of structures has a major influence on house survival;
- Building quality, detail and possibly house age appear to be factors influencing the likelihood of house loss;
- Brick houses performed significantly better than mud brick and light-weight constructions clad with timber and cellulose cement sheet;
- The potential for wind damage of structures should be a key factor in future building consideration in bushfire-prone areas;
- Approximately 20% of house loss in the chosen study areas appears to be directly related to their immediate proximity to adjacent forest fuels;
- House loss has occurred at distances greater than 380 metres from continuous forest and this figure may be substantially greater once a broader set of houses is analysed;
- Over half the surveyed houses lost in the bushfires were not in regions classified by a Wildfire Management Overlay;
- Metal and concrete water tanks are more likely to maintain an effective water supply for house defence than polyethylene and fibreglass tanks;
- Design, location and degree of protection of water pump and pipe-work are important factors in maintaining an effective water supply throughout the fire event;
- Mains water pressure and mains electricity cannot be relied upon during the fire event;
- Vegetation overhanging or immediately adjacent to houses, whether it is isolated or continuous, is a key factor influencing the likelihood of house loss.

New regulations that adopt the Australian Standard for Design and Construction of Buildings in Bushfire-Prone Areas (AS 3959-2009) came into effect in Victoria on 11 March 2009. The new regulations stipulate that every new home built in Victoria will undergo a Bushfire Attack Level (BAL) site assessment as part of the application for a building permit, to determine which method of construction is to be used. There are 6 BALs, replacing the 4 levels in the 1999 version of AS 3959.

3.5.2 Managing our coastal zone in a changing climate, October 2009

Aspirational items - recommendations from the Parliamentary report:

- An overhaul of the building code to make homes more resilient and for the legal liability for future property losses to be sorted out;

- AEMC examine an improved early warning system for coastal areas in the event of extreme seas, storm surges, major erosion or flooding;
- The Surf Life Saving network be brought into the emergency planning system to deal with the impact of increasing storm hazards;
- Addressing the serious gaps in the planning guidelines, the law, insurance and emergency planning; and
- The Federal Government consider adopting a nationally consistent benchmark on projected sea level rise as states and local governments struggle to work out their response.

3.6 International agencies

3.6.1 NZ

No aspirational information.

3.6.2 UK

- Moving to Electronic Data Interchange (EDI) and modern real time activity reporting. Majority of reporting is still paper based though this is changing;
- Customer Relationship Management (CRM) system built for all brigades and their web sites to allow participative approach into Community activities. This allows for a simpler way to aggregate community reaction and response to incidents and allows for easier tailoring of community education activities for preparedness;
- The UK fire rescue customisation of CRM has given best practice units the ability to integrate requests through the national E-fire portal; permit the public to book a time for an HFSC rather than just request a home visit; use workflows to automatically alert community safety teams about a particular customer's non-fire service needs such as social services or benefits; and extend the use of the CRM system to fire service teams using mobile devices; and
- Through the use of CRM, the UK has seen better communication between research bodies, developers and the fire services. The CRM system is a more intuitive novel solution, built on value chain modelling, where all information is linked back to the public. This system is not based on putting out fires, but targets safety by using performance indicators, demographic profiling, and automation. The Emergency Management Toolkit is used by all. For example the home safety checks are filled out by the public and this feeds through to the right person, who can action this information. Before the CRM system, this information was held in spreadsheets and there was no interface with the public. The home fire safety teams are now seen to be twice as productive then pre CRM. It is easier to capture information, schedule appointments and is improving collaboration between groups such as educators and fire centres.

3.6.3 USA

- Department of Homeland Security Data Model (DHS) allows for information sharing through the open publishing of modelling standards by many government agencies. By making this information accessible in model format, agencies can use and relate this information both at high level and low level to address their own needs. This allows for potential users to tap into information immediately and this information can be across various fields of expertise such as geospatial information, incident management information, demographic information, land use, security, hydrography and infrastructure protection. Although this model has existed and has been continually developed in the USA since mid 2007, the uptake for the model has been slow, and also the agencies that use the model only use certain parts of it e.g. geospatial elements.

Note: The future for USA will include the take up of the DHS across all states.

- The model in the USA is now up to version 2.7 which has taken a little over two years to develop. The model has been designed with backwards compatibility in mind allowing for software, and middleware that has already been written to be able to continue to use it. It should also mean that the existing development should be easily modified to make use of the latest extensions to the model, should a user wish to do so.

Note: A total rebuild was not necessary. By using an extensible standard an exchange between legacy systems and a data warehouse is possible. The model is XML based which allows for all the benefits of open standards, and the XML messages can be 'pruned' or populated as desired by users. This model allows for the use of real time location based services leveraging off public domain geospatial services. By using XML standards, the user needs to know only the XML

schema layer to get different systems to work with one another. This allows considerable freedom in platform selection by users of these standards. It allows for many vendors to be able to understand the schema design and support it.

- DHS has taken the mantle to provide support for several major models, including the National Information Exchange Model (NIEM). The National Information Exchange Model is increasingly supported at DHS level.

Note: By designing the models based on the activity domains (rather than just one function or agency), the design of the model should find an activity-based fit that makes the sum of its parts far outstrip the value of the individual sub-models. In this context the PPRR modelling efforts of all ESO agencies may find additional support of this model within a larger model framework.

- US have found that when building systems it is important to look at what is available, rather than perceiving that an agency is the sole developer. For example, in the US, Google Maps had “half of its 500,000 servers serving maps” (Smith, Susan: 2008, Update on the DHS Data Model, GIS Cafe: Industry News, http://www10.giscave.com/nbc/articles/view_article.php?articleid=581749&page_no=1) compared to National Maps which was a single server in one State.

Note: Additional performance for geospatial needs for the emergency management, in an emergency situation

- Uses of standards from other countries have provided leverage, for example Public Safety Canada.
- Fire rescue can be seen to be part the national system and when larger national security concerns such as serious hazmat and biohazard concerns arise, benefits are gained as a more holistic picture is painted by using a more collaborative system based on all activities of the agencies.

4.0 Verify the value of retaining current data categories and items, and identify unnecessary or inappropriate data categories or items that should not be included in the proposed data model

4.1 Introduction

4.1.1 Data categorisation must be kept as simple as possible

It has been found, both in Australia and overseas, that data that is presented in overly complicated, convoluted or long formats in data categories will not be effectively and/or efficiently recorded. If the code sets appear too long (in pick lists or otherwise) or questions ask the collector/recorder to consider open ended, elaborately detailed answers, or invite whole lists of possible combinations of interpretations, then they are likely to bias that instance of the collection or recording. This bias means overuse of codes that are "closest to the user" or to default selections, or, in the case of written submissions, uninterested or less than genuine attempts at an answer. These principles apply to both paper and electronic means of collection and recording. However, there is nothing stopping the data category design being elaborate or complex, as there may be a business need for this to occur, but this categorisation of data must be separated from the collection or recording layer which must be kept as simple as possible.

4.2 UK examples

The UK examples probably illustrate some of the faster moving reforms in this area. The UK is small geographically but large in population. This shapes the idiosyncratic cultural make-up and consequent organisational structure across its comparatively compact (though numerically still large) jurisdictions. Reporting occurs in real-time and at longer intervals primarily to the government department of Communities and Local Government. The reforms of fire and rescue services in the UK have come relatively quickly and have been comprehensive.

4.2.1 Outcomes of the Bain and Katalysis Reviews

The UK counterpart to AIRS (Australia) and NFIRS (US) is Fire and Data Reporting (FDR). The traditional, classification based way of collection was increasingly not seen as useful for aggregating into high level reporting and performance metrics. Paper return through the old FDR1, 2 and 3 forms was actively being phased out following the 2002 Independent Review of the Fire Service paper (the Bain Review) and later, the Katalysis Review in 2004. The shift to electronic data submission and XML data exchange of the raw data had begun. The release of the Bain Review saw significant changes in the UK fire and rescue sector. This involved systems or information technology changes and fundamental changes to the business models of the fire and rescue services in the UK.

4.2.2 Fire Service Emergency Cover Toolkit

The most obvious and effective change in terms of data requirements was the removal of national standards for the deployment of resources to tackle incidents. Brigades are charged with producing Integrated Risk Management Plans (IRMP) to determine the local priorities for the deployment of such resources. This means a fundamental shift from generic categorisation of data. The Brigade may formulate an IRMP subject to their local conditions. While expert on this, they are not expert in considering categories of data they need never visit. Likewise, their knowledge of their own domain can far exceed the level of detail they need to describe their own risk management needs following what would be perhaps inadequate general classification. This has led to the creation and adoption of the Fire Service Emergency Cover (FSEC) Toolkit, which addressed a holistic approach to risk management for every particular location feeding up to Brigade level, and reporting beyond to the Communities and Local Government (CLG). This outcome based linkage is borne out of the integrated approach.

4.2.3 Simplification

These changes involve successful implementation of simplification. In the UK example below, the data for "special service incident" has been re-organised into a simple hierarchical structure, where each code set is kept to the minimum number of selections. Careful overall architecture and not just concentration on a single classification is the key to this approach, making an overall difference rather than just an isolated solution.

Source of this table: Katalysis Ltd with Donachie Associates, 2004, Review of the National Fire and Rescue Incident Statistics Collection, Final Report, <http://www.communities.gov.uk/publications/fire/review>. UK Review of National Fire and Rescue, Annex 7

Special Service Incident	Road Traffic Accident	Person rescued
		Assistance given
		No assistance needed
	Accident	Aircraft
		Farming
		Industrial
		Railway
	Rescue	People
		Animal
		Lift
	People	Removal of object from
		Suicide
		First aid only
		Sports activity
	Provision of advice	Appliance or equipment
		Officer only
	Miscellaneous	Assistance to Police
		Recovery/retrieval of object
		Pumping water
		Leaks or spills
		Making safe
		Effecting entry
		Standby in potentially dangerous situation
Other		
No service rendered	Good intent	
	Hoax call	

4.2.4 Consultation comments during UK reform process: general

Source: Katalysis Ltd with Donachie Associates, 2004, Review of the National Fire and Rescue Incident Statistics Collection, Final Report, <http://www.communities.gov.uk/publications/fire/review>.

Recent reforms include review of whether current complexity of reporting (via 'forms', paper or electronic) and codes is necessary or can be simplified to allow the local data input to become more robust. General comments from consultations during the reform process were:

- Need to maintain time series;
- Need to have a data type for a set of instance identifiers for incidents i.e. being able to create a record referring to the same instance of an incident beyond the initial instance identifier (manifold uses);
- Simplify reporting to non-fire incidents. The variety of information needs to be arranged hierarchically and into smaller groups. Often systems are set up with long pick lists. With these long pick lists there is a tendency to choose quickly and not always the most accurate information from the picklist as the data entry takes more time when scrolling down long lists. More accuracy is obtained by smaller pick lists;
- Clear guidance of what information is needed;
- Definitions are important, and there often too many assumptions. A good example deals with defining what a derelict car might be (how do you define that—at what point does an abandoned car, which may or may not be burning at the time of reporting, become a 'derelict' car?). What about integration to other databases - Registration, make and model, reported as stolen? A need for crime related instance identifiers to be linked to fire and rescue data collection and recording points; and
- Need to retain an ability to generate a 'form' - or a subset of information - to pass on to other agencies. In practical terms, what this means is the ability to collaborate with colleagues in external organisations or agencies that might be better informed about particulars of an incident than the primary reporting agency is responsible for. In practical situations, the difficulty discovered is getting the right assistance to focus on the missing information, without wasting time for everybody involved in the reporting effort.

4.2.5 Consultation comments during UK reform process: incidents

With incident information data categories, the primary incident recording mechanism in the UK was the FDR1 form. The experience in the UK indicated that there was a “need for more fire safety information, perhaps by cross-referencing addresses with a fire safety database held at brigade level” :(Katalysis Ltd with Donachie Associates, 2004, Review of the National Fire and Rescue Incident Statistics Collection, Final Report, <http://www.communities.gov.uk/publications/fire/review>.) :

- More effective detail on the building structure and construction type was needed;
- A need to identify whether a property was heritage listed or in a special risk category, and the ability to do this from a linked database otherwise it was unlikely that this was going to be reported;
- A need for a data category to report on the presence of alarms, whether they were in the area affected by the incident or not;
- A need to report whether a present smoke alarm was issued by a FRS Brigade, and this was to be provided by a link to a CFS database; and
- Again, inexact definitions were questionable in their usefulness.

4.2.6 Consultation comments during UK reform process: Location-based data categories (section 3):

- A need to simplify property codes e.g. by using building regulations purpose group codes;
- For the burning vehicle example above, the provision for the recording of a crime instance identifier was found to be required. This type of linking information would be of use in other emergency services organisations' work, and also to the fire and rescue service organisation;
- More information on other vehicles was also found to be desirable e.g. the size of ships; and

- Information on extinction of fires (section 4). There was a need to: update the firefighting methods recorded; record the resources actually used in firefighting; require more details on sprinklers; and when dealing with appliances, the number of appliances mobilised versus the actual number used was required.

4.2.7 Consultation comments during UK reform process: Damage and detail of incident (section 5):

- There was too much complexity, especially around 'possible cause' of the incident or damage. The value of these assertions was dubious or counterproductive, especially when firefighters were asked to give evidence based on these statements in courts of law (typically within insurance claim cases);
- There was too much complexity around "Damage caused to" and "Area damaged" (Section 5.9) – thought to be obtaining very unreliable answers. A need to identify precise uses of this information, and if useful, a better way of obtaining it;
- A category for an inability to establish an accidental cause was recommended ('unable to establish an accidental cause'). Provision for foreign investigation information in linked police crime number instances was thought to be a future requirement; and
- Too much complexity around the accounts for fire heat and smoke was also found where separate sections in data categories were recommended to be compressed into one.

4.2.8 Consultation comments during UK reform process: Casualties (since section 6):

- In the casualties reporting data category again definitions were inexact or did not align with police or department of transport definitions;
- It would be useful to collect ethnicity;
- Would non-casualties who were rescued need to be identified?;
- Integration with data categories requiring access to the national health service records was suggested; and
- Further integration with coroners' reports of deaths was also recommended.

4.2.9 Consultation comments during UK reform process: Recording additional information (section 7):

- Section was considered with a suggestion to move the majority to the investigation section.

4.2.10 Conclusion of UK example

These examples show that classification efforts are often attempts at capturing 'complete' information, but the real life situation leads this approach to be assessed as counterproductive. As far as data collection and recording is concerned, being faced with a complete classification may impact on the quality of the data being collected, in spite of the completeness of the classificatory efforts, by virtue of its complexity, proneness to confusion, proneness to being too judgmental, and risk in not collecting the required data. What is needed is for information from multiple sources to be exchanged and collected in such a way that the experts in each field of expertise contribute to a palette of information, where the 'colours' don't mix. Internationally speaking, the way forward is being shown through the increasing use of data models and the 'live' registry-like qualities of XML.

4.3 US examples

The US emergency management models are also comprehensive, but are just a small part of a much bigger program of work, when viewed in light of the highly ambitious Department of Homeland Security (DHS) model. The DHS model encompasses much beyond emergency management, including Infrastructure Protection, Immigration, Intelligence, Screening, Criminal Justice (including FBI concerns), and International Trade. The interoperability of data is

expressed through the National Information Exchange Model (NIEM), which is a partnership between the US Department of Justice and the US Department of Homeland Security (DHS). The scope of NIEM goes beyond incident data as experienced in NFIRS, FDR and AIRS for the US, UK and Australia respectively. The US approach is to properly relate as much information of national importance as possible, and to enable the automatic collection and recording of these collaborative efforts through the offering of XML based schemas. Naming conventions (the way data is described) follow ISO 11179 and this allows elements to retain some semantic meaning even when viewed with neither context nor definition. For example, "Name", versus "PersonName" and "OrganisationName".

5.0 Identify and assess the importance of commonalities and differences in activity collection and recording systems

In the Australian context, the ESOs have built systems, integrated systems, or have had software vendors build systems, to help them collect and record data in a variety of operational contexts. They have also attempted to integrate systems which are no longer contributing data of sufficient use on their own to collection and recording systems. As it stands, the variety of systems tend to have strengths where the software programming has been generally nurtured by the same set of software architects or designers.

5.1 Systems comparison

5.1.1 NSW SES Systems

Name	Purpose of NSW SES system	PPRR data	Source/Collection	System type
SES Online		Prevention, Preparedness		IT system, on-line data entry
RFA Online	Reporting from RFA Online can be at a low level or aggregated up to a higher level such as event. Report created to suit)	Prevention, Response Recovery Other		IT system, on-line data entry

5.1.2 NSWFB Systems

Name	Purpose of NSWFB system	PPRR data	Source/Collection	System type
AIRS	A computer system used to collect and report on responses to incidents and emergencies. Data collected include: number of casualties, property type involved, location details, resource types and usage, cause & equipment, fire fighting methods and techniques, detection and suppression performance details. AIRS also captures data on the responses of each operational staff dispatched at the scene	Response Recovery		IT system
Boss	An application that allows users to view in real time the status of the CAD system through a web interface	Response Recovery		
FireCad	Computer Aided Dispatch System. To dispatch and track resources assigned to an incident.	Response Recovery		IT system
FARMS (False Alarm Reporting Management System)	A false alarm management tool that identifies repeated patterns of false alarms at premises for further investigation. The system has the ability to register a false alarm charge against a premise, and is used for the generating of false alarm invoices to AFA providers.	Response Recovery		IT system
VKG Database	A computer system managed by the NSW Police Force to collect and report rescue responses from the various service providers.	Response Recovery		Database
Debriefs	Information is gathered regarding Lessons Learnt at an incident and used for training and quality assurance purposes.	Response Recovery		This is a manual paper based system.
Fire Trac	A computer system that collects evidence related data and reports on key fire investigations and fire fatalities	Prevention, Preparedness		IT System
CFU (Community Fire Unit Database)	A computer system that collects and reports data on CFU membership, HR and training	Prevention, Preparedness		IT System
CARS	A computer system that collects and reports on community safety and preparedness activities performed mostly by Fire Station personnel	Prevention, Preparedness		IT System (5 years old)
ePIPs	Pre incident planning system. A Database of identified infrastructure relating to specific sites of high risk and incident	Prevention, Preparedness		IT System

	management procedures designed to mitigate			
ComSafe	Two systems are used: CARS and CAPABILITY. CARS enables the collection of data related to number of hours and types of activities delivered by Comsafe trainers. CAPABILITY is a web based system that collects and reports on commercial deployment of NSWFB resources for training in safety and preparedness for industry and business, hiring of NSWFB resources for filming purposes. It contains address details and is able to report on activities/ services performed by trainers as well as preparedness outputs for industry and business	Prevention, Preparedness		IT System
BUSHFIRE/ I-ZONE	Is a database that helps determine the risk level of bushfire prone areas	Prevention, Preparedness		Database
SPRINT	Strategic Reporting System – A computer application that provides a one-stop shop of key strategic information, and statistical outputs for PPRR, HR and financial management.	N/A		Management Systems
QUAD	A qualifications database used to track employee training achievements			Management Systems
ESCAT	An electronic supply catalogue system used to order and monitor inventory purchases.	Out of Scope for project		Management Systems
BART	Brigade Automated Retained Timesheets: Used by retained staff to input work done and kilometres travelled for payment for work	Out of Scope for project		Management Systems
SAM	System to Automate the Manual disposition - a real time record of Fire Fighters assignments (up to the rank of Inspector) at Fire Stations and Cost Centres. Base data sourced from HR system. Rostering system, provides resource availability statistics	Out of Scope for project		Management Systems
SLANT	Sick Leave Analysis Tool. A computer application that is used to collect and report on sick leave trends. Data are sourced from HR Payroll system & manipulated locally.	Out of Scope for project		Management Systems
Station Portal	Graphical web based entry point into the various NSW FB system designed as a desk/bookshelf			IT system
SABRE	Smoke alarm activity – number of alarms installed, number of existing alarms, building type, numbers of batteries installed			IT system
Petrol	Database with Petrol details			IT system

SAP	SAP is a HR/Payroll/Logistics/Asset Management system. It provides linkage point between BART, QUAD which feeds into SAM and Time Sheets	Out of Scope for project		IT system
WILE	System tracking equipment and their maintenance of key equipment t that must be stocked and maintained adequately Hazmat equipment, (e.g. Breathing apparatus) the other for Rescue Control equipment (e.g. Rescue vehicles. Other Equipment that is not tracked e.g. buckets, ladders etc. Records of when equipment serviced and when next service due.	Preparedness		IT system
ESS	Electronic Self Service - Payroll	Out of Scope for project		Management System

5.1.3 NSW RFS Systems

Several systems are utilised to collect PPRR information. Data collection is a combination of manual and system generated. The main systems are:

Name	Purpose of NSW RFS system	PPRR data	Source/Collection	System type
FIRS	Stands for Fire Incident Reporting System. Primarily captures the "Response" data.	Response		IT system
BRIMS	Stands for Bushfire Risk Information Management System. Primarily captures data on referred development applications in bush fire prone areas, Permits to Burn, Hazard reduction activity, Hazard complaints, Bush Fire Risk Management Planning, warnings, fire danger, Community Fire Wise Program	Prevention		IT system, Web browser access with security, run by NSWFB
iCON	Incident Control OnLine. Real time text and spatial data on current incidents. On line, state wide summary information, text and spatial representations of data. Online Fire Investigation sub module is part of iCON. Capability of taking spatial downloads from GPS compliant third party applications.	Preparedness		IT system, on-line data entry, come information by data-feed, some manual input. Helifire information is downloaded to ICON. MAP drawing is in ICON
iLOG.	Call tracking system specifically related to current incidents.			IT system
Helifire	Portable spatially based fire plotting, tracking and reporting system. Plotting of fire line data etc real time. Down load capabilities to other RFS corporate systems.			IT system
FireCAD	(conducted on behalf by NSWFB)	Response		IT system
AIRS		Response		IT system
ATS	Automatic Tracking System which tracks task force transport manifests, accommodation, liaison, individuals, Night/day shifts, and tasks assigned, used for interstate and for neighbouring districts.			IT System, feeds into RMS (Human Resource File)
MIC	Major Incident Coordination system which is used by task force and or individuals for example, national Parks, RFS but no Police			IT system
SAP	Payroll system which NSW RFS use shared resource			IT system, NSWFB resource
ESDM	Electronic Service Delivery Module covers Risk - any fire			IT system

	stations extra, fire trucks extra, training for community - inputs into budget. CLARITY to replace this system.			
RMS	Resource Management System covers people, brigades, and resources. The resources are now kept on Fleet system			IT system
	Red Fleet covers tankers			Manual system of Spreadsheet/Exercise Book
	White Fleet covers all other vehicles			Manual system of Spreadsheet/Exercise Book Spreadsheet/Exercise Book . Some records will be with local council
	Corporate Report systems			IT system for Management
SMU	Service Membership Unit which is used for crime checks on new starters.			IT system, restricted access

5.1.4 CFA Vic Systems

Name	Purpose of CFA system	PPRR data	Source/Collection	System type
RMS	Resource Management System - database recording CFA service delivery assets and people	Preparedness, Response	CFA members - brigades and staff - as required	IT system, on-line data entry. RMS supports and is integrated with IMS, FIRS, TRAIN
IMS	Incident Management System - database supporting real time data entry of incident details, resource allocation and activity status	Response	CAD, CFA members, ICC members - during incidents	IT system, on-line data entry except for time stamps transferred from CAD
FIRS	Fire Incident Reporting - database supporting full AIRS incident reporting	Response	CAD, call centre, CFA members - following incidents	IT system, on-line and call centre data entry except for time stamps transferred from CAD
TRAIN	Training database recording CFA training courses and qualifications	Preparedness	CFA members - as required to record qualifications	IT system on-line data entry
CAD browser	Database for interfacing to computer aided dispatch data	Response	ESTA - on receipt and dispatch of incident	IT system, populated from Emergency Services Telecommunications Authority (ESTA)
TRAX	Database recording non-response service delivery and compliance	Prevention, Preparedness	CFA members - on receipt and scheduling of requests	IT system, on-line data entry
Section29	Database recording capacity of each CFA brigade as captured by questions and inspection	Preparedness	CFA members - annual inspection process	IT system, web-based on-line data entry requiring some manual inspection and tabulation
PIMS	Database capturing recommendations and actions for service delivery improvement from operational and external reviews	Prevention, Preparedness, Response, Recovery	HQ Operations - on receipt of review feedback	IT system, on-line entry requiring manual tabulation of data
FIMS	Database capturing fire investigation records	Recovery, Prevention	Fire investigators and HQ Operations - on completion of fire investigations	IT system, on-line entry
ESA	Database for reporting non-response service delivery	Prevention, Preparedness	CFA members - quarterly summary	IT system, on-line data entry requiring some manual tabulation

			of activity	
Data warehouse	Overarching data repository extracting data from above independent databases and applying consistent business rules for performance reporting	Prevention, Preparedness, Response, Recovery	automatic extract	IT system, automated extraction of data from above databases

5.1.5 QFRS Systems

Name	Purpose of QFRS system	PPRR data	Source/Collection	System type
Australasian Incident Reporting System (AIRS)	AIRS - Records data for incident reporting		AIIRS Manual (from AFAC) based on US system	IT system, QFRS AIRS system built 1997 OMS replacing AIRS and SMS (Station Management System) QFRS updated the AIRS manual as some of the codes were not relevant (e.g. information related to US rather than Australian conditions). Example of improvement in OMS from AIRS "Un-determined" or "not classified" currently at top of screen in AIRS making it the easiest option to pick when reporting incidents. This has been moved to the bottom in OMS.
Station Management System (SMS)	SMS - Records duties and tasking information at a station level, Community education, inspections etc are recorded in SMS			IT system, SMS system reporting not mandatory, therefore data is not as a good quality.
Building Fire Safety (BFS) Database	BFS - Records data related to the Building Approval process			Database
ESCAD	Is the equivalent to NSWFB FireCAD		Visi CAD USA, different to VISION	IT system,
CORE	Web based reporting system used for management reporting. Predefined & ad hoc reports are generated			IT System for Management
Data Warehouse	Measures found in data warehouse are for ROGS information and to produce monthly reports, down to station level for measures			
OMS	Operations Management System (OMS)			IT System, OMS replaces AIRS and SMS for metropolitan fire brigades and RIMS, SMS and Rural AIRS for rural fire service, Volunteers in rural fire service don't access systems, will still enter into paper forms.

TOM	TOM QFRS GIS unit web mapping application and real time information on fires, road crash rescue			IT System
IRIS	HR info loaded from IRIS system (HR system, contains every person employed by QFRS) - point of truth depends on station, some don't use IRIS, they use SMS.			IT System, Management system
E-time sheet	E-time sheet system which includes all timesheets			IT System, E-time sheet system will be integrated into OMS
	GPS tracking of vehicle			IGPS system being integrated into ESCAD

5.1.6 UK Systems

Name	Purpose of QFRS system	PPRR data	Source/Collection	System type
Optevia MS-Dynamics CRM		Prevention, Preparedness, Recovery		
AssetCo Data Solutions MIS (over 30 integrated applications)		Prevention, Preparedness, Response, Recovery		
Marconi/Petards MIS		Prevention, Preparedness, Response, Recovery		
LLPG	Local Land and Property Gazetteer	Prevention, Preparedness, Response		
NLPG	National Land and Property Gazetteer	Prevention		
NLUD	National Land Use Database	Prevention		
IRS deals in XML not old EDI - comprising data from FDR1, 2, 3, and OPS4 and OPS5		Response		
Motorola Printrac ProCAD		Response		
FIM CAD		Response		
FiReControl Gazetteer		Response		
Automatic Vehicle Location System (AVLS)		Response		

5.1.7. USA Systems

Name	Purpose of QFRS system	PPRR data	Source/Collection	System type
NFA Online		Prevention, Preparedness		
ICS100		Preparedness		
NFIRS		Response, Recovery		

5.2 Systems commonalities and differences

Across the organisations there were many consistencies found. However many of the weaknesses were related to historical systems. These historical systems made it extremely difficult for full integration and for interoperability to take place.

5.2.1 Summary of findings

Organisation	Best Practice	Opportunities to develop
NSW SES	<ul style="list-style-type: none"> • Strong focus on education and training of all staff; • Simple streamlined systems; • Support minimal data entry; • Communications centre well prepared for receiving calls; • Integrated • Web based system accessible to all volunteers; • Website presence - wealth of information available for public; and • Champions of mutual aid. 	<ul style="list-style-type: none"> • No classification/data standards; • Difficult to make major changes due to dependency on volunteer workforce; • Reliability of data dependent on volunteer workforce; • Reluctance of some volunteers in using IT systems; and • Declining volunteer numbers, attrition falling, increasing workloads.
NSWFB	<ul style="list-style-type: none"> • Strong focus on education and training of all staff; • Well defined professional, retained and volunteer workforce; • Communications centre well prepared for receiving calls; • Well trained (experienced) staff in communications centre; • Website presence - wealth of information available for public; • Championing integrated efforts with related departments; and • Champions of mutual aid. 	<ul style="list-style-type: none"> • Lack of integration and interoperability between systems; • Stove pipe/siloed systems; • Legacy systems with missing documentation • No enterprise; architecture at high level; • No classification/data standards; • Classification schemas incident focused; • Attempts to standardise performance indicators focused on incidents; • Legacy systems difficult/burdensome for data entry; • Person attending incident not always the one completing the incident report; • Limited validation of data entry; and • Boundaries of responsibility overlap, system difficulties in articulating boundaries.
NSWRFS	<ul style="list-style-type: none"> • Strong focus on education and training of all staff; • Integrated operations 	<ul style="list-style-type: none"> • Brigades not CAD enabled, INSTEAD USE Pagers; and • Never sure of brigade

	<ul style="list-style-type: none"> • system (in pipeline); • Champions at upholding a classification; • Attempts to classify and standardise data entry; • Expert at use of aircraft; • Communications centre, capable of hosting extremely large mutual aid arrangements; • Website presence - wealth of information available for public; • Integrated website – e.g. part of department of emergency services; and • Champions of mutual aid. 	<p>availability.</p>
VIC CFA	<ul style="list-style-type: none"> • Strong focus on education and training of all staff; • Well defined professional, retained and volunteer workforce; • Entire state is CAD enabled, all fire services are linked to CAD system; • Whole rural areas are managed by CFA; • Clear boundaries; • VIC MFB only responsible for Melbourne; • AIRS classification linked to a well integrated set of systems; • FIRS/OMS/RMS system supports operational processes; • Manual transfer of information is required from Incident Management System (IMS) into FIRS (AIRS) incident reports.; • Staff attending incident manage the incident rather than call centre staff. Updates to 	<ul style="list-style-type: none"> • No classification/data standards; • Unqualified staff in call centre receiving incident calls, dependent on ground (front line) staff tracking/reporting incidents; • Separate organisations for metropolitan and country fire services; • Clearly demarcated zones of responsibility for metropolitan and country; • Weak on recording community activities, currently managed at zone level through spreadsheets; and • No integrated system.

	<p>incident coming from staff on the ground;</p> <ul style="list-style-type: none"> • VIC SES use the CFA IMS system providing ability to manage incidents from same CAD data; • Website presence - wealth of information available for public; • Real-time information accessible to public on website; • Fire equipment - maintenance of own equipment such as fire extinguishers and PPE tailored to Victorian bush conditions; and • Champions of mutual aid 	
QFRS	<ul style="list-style-type: none"> • Strong focus on education and training of all staff • Integrated operations system (in pipeline) • Attempts to classify and standardise data entry • Organised under one department • Move towards common systems between different rescue services • Website presence - wealth of information available for public • Integrated website – e.g. part of department of emergency services; and • champions of mutual aid. 	<ul style="list-style-type: none"> • No classification/data standards; • Difficulty getting volunteers to report on incidents; • Legacy systems do not validate data as effectively resulting in reporting inaccuracies ("easiest option chosen"); • Volunteers and country fire services use paper forms to record incidents; • Challenges in managing a vast region with varying conditions; and • Brigades not CAD enabled.
NZ	<ul style="list-style-type: none"> • Highly flexible organisation; and • Simple, well designed operational control systems. 	<ul style="list-style-type: none"> • Dependent on mutual aid for much of its larger operations.
UK	<ul style="list-style-type: none"> • Reform efforts effective following bold reviews; • Empowering culture emerging; • Risk management champions; and 	<ul style="list-style-type: none"> • Long culture of slow paper based collection and reporting; and • Lack of integration between counties.

	<ul style="list-style-type: none"> • Integration with communities based ties to localities for ease of communication. 	
USA	<ul style="list-style-type: none"> • Championing integrated efforts with related departments; • Strong vendor support to NFIRS, NIEM, and DHS is effectively encouraged by agencies and other government bodies; and • Champions of mutual aid. 	<ul style="list-style-type: none"> • Fragmented fire and rescue services spread over 3100+ counties.

Key

Blue Text – similarities between agencies

6.0 Identify and assess the importance of commonalities and differences in definitions, standards and classifications used in various systems.

6.1 Definitions

6.1.1 Semantic creep

The basic definitions of terms are the bane of classificatory efforts e.g. definition of incident and event not clear, circular references, not consistently used by all organisations, etc. Definitions for terms vary across and within organisations. Internally they are shaped by the technology systems and the operational processes used. There is a mix of definitions coming from different bodies, as well as many internal definitions. There is a tendency for definitions to undergo semantic creep. Where this has occurred, some names or concepts defined by IT systems have gradually seeped into the everyday operation and culture of the organisation(s). These terms are then dependent on the particular taste or design discipline of individual programmers and lack classification. It is therefore a challenge to think how a classification that would deal with this confusion over semantics might be arranged. The international context has addressed this through the use of the rigour of a registry or modelled approach, where items join a registry for sign off purposes. One example of this approach is through the USA standard ISO 11179.

6.1.2 EMA Glossary: 'incident' and 'event'

Some examples from the Australian context show what can happen with commonly used terms in the absence of the rigour of a properly designed metadata supported data element registry, such as one following the ISO11179 standard. For example, the term 'activity' is common in the description of everyday operations and more for all ESOs. However, according to the EMA Glossary of Terms, the definition of activity does not refer to doing tasks or 'things' related to emergency management. In Australia "activity" is shown to mean "the number of disintegrations per unit time taking place in a radioactive material" (p2, EMA Glossary of Terms). Further, for the commonly used terms 'incident' and 'event', circular definitions exist.

The EMA Glossary defines "incident" as:

- "An event, accidentally or deliberately caused, which requires a response from one or more of the statutory emergency response agencies".
- "A sudden event which, but for mitigating circumstances, could have resulted in an accident."
- "An emergency event or series of events which requires a response from one or more of the statutory response agencies. See also accident, emergency and disaster." (p64)

An "Event", is defined as: "An incident or situation, which occurs in a particular place during a particular interval of time." (p44)

6.1.2 Primary and secondary incidents

Furthermore, the CFA does not use the concept of 'event' however the Emergency Service Telecommunications Authority (ESTA) does use the term. ESTA uses computer aided dispatch, and the CAD 'packets' of information are received and handled in CFA systems, including the Incident Management System (IMS). Here the treatment of the CAD event data is all treated as incident data...

In the reporting process, CFA aims to ensure that multiple turn-outs to the same incident are not counted as multiple incidents. The allocation of a primary brigade to an incident is the means by which CFA control this. The first brigade turned-out by CAD is assigned as the primary brigade. All others are assigned as support brigades. All have to complete FIRS incident reports, but they are aggregated under the incident report assigned to the primary brigade. All reports have to be

submitted for the incident report to be considered complete. At this level it is consistent with the concept of "incident" proposed in the data model, with each brigade turn-out potentially being an "activity".

This gets complicated when there are large fires such as on Black Saturday. For example, a major fire started at Kilmore East and spread eastwards generating many separate but related call-outs because of spot fires, smoke sightings, SOS calls, etc. In post-incident analysis, all these incidents were reviewed and if appropriate were re-assigned as support reports under the primary report for Kilmore East. That way, CFA can identify the total resources committed, the key timings, activities, etc and we report only one incident. At this scale, it is consistent with the concept of "event" proposed in the data model, with many separate "incidents" and hundreds of "activities".

This is similar to the way SES uses events to group a series of requests for assistance over a time or location interval. The use of primary and secondary 'objects' allows for more dynamic manipulation of recorded data, and in anticipation of further incoming data collected and recorded that may be related to what is already known. What is already known then needs to be established along a pattern of 'well known' terminology. The 'primary' incident then gives the information this flavour, even if the primary incident was perhaps not the most troublesome incident or the 'biggest'. For example, a request for assistance (RFA) for hailstorms in Kensington, and around the same time frame requests for assistance for a flooding canal in Maroubra and Bondi. These separate RFAs may be grouped into a single event and named the "Sydney Hailstorms" and managed as a single event.

6.1.3 Location

The definition of location is varied across organisations and internally within systems. The activity being undertaken appears to shape the definition and scope of location. For example, in the NSWFB FireCAD system location is based on longitude and latitude.

6.2. Standards

6.2.1 Australian standards

Standards used in the Australian context include:

1. AIRS for incident management
2. AIIMS for operational management
 - a) Australasian Inter-Service Incident Management System (AIIMS) - used by all Australian fire agencies and many SES for incident management. Principles of AIIMS:
 - i. management of incidents by objective;
 - ii. one controller of the incident - the Incident Controller;
 - iii. delegation of functions depending on the complexity of the incident;
 - iv. span of control - one person responsible for five people at any one time; and
 - v. the development of a plan outlining strategies and tactics to combat the incident.
3. AFAC endorsed Inter-agency CAD Electronic Messaging System Specification (ICEMS) version 4.2 released March 07.
4. CAP (Common Alerting Protocol) is American, developed by the Organisation for the Advancement of Structured Information Standards (OASIS):
 - a) AFAC formally adopted the position that its member agencies will use the OASIS Common Alerting Protocol, V1.1;
 - b) CAP (Common Alerting Protocol for bushfire warnings) permits a consistent warning message to be disseminated simultaneously over different media (for example, internet, SMS, landlines, email). Once adopted, CAP can be incorporated into any number of technology applications. It has been described as a 'write it once' tool; and
 - c) AFAC endorsed Common Alerting Protocol (CAP) Version 1.1 - local.

5. Institute of Electrical and Electronic Engineers (IEEE) standard 15222 Guide to the IEEE 1512™ Family of Standards:
- a) IEEE Std 1512-2000 (Base Standard);
 - b) IEEE Std 1512.1-2003 (Traffic Management);
 - c) IEEE Std 1512.2-2004 (Public Safety Standard);
 - d) IEEE Std 1512.3-2002 (HAZMAT Standard); and
 - e) IEEE Std 1512a-2002 (Emergency Management Data Dictionary).
6. Emergency Alerting System (EAS) - dedicated pager messaging system using 212 radio transmitter used by emergency services, CFA volunteers, Vic SES, Ambulance (rural).
7. NFPA 1992 2005 Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies.

6.2.2 ESO standards table

The following table demonstrates standards followed by the different emergency service organisations, including those that are being trialled and constitute immediate aspirations in the domain. In the Australian context, it is evident that local organisations are internally defined, whereas internationally, in the UK and the USA, they have a particularly well exposed maturity to data exchange standards. While internal operations can still be defined by each agency, the data requirements for reporting purposes is well on the way to being interoperable to the desired needs via eXtensible Markup Language (XML) based approaches. As the name suggests, XML is about extensibility, data sharing and interoperability. This XML approach has already begun, and is increasing, without disruption to existing operations of the individual agencies.

Standard	NSWF B	NSWR FS	NSWS ES	QFRS	CFA	USA	UK	NZ
Australasian Inter-Service Incident Management System (AIIMS)	y	y	y	y	y	n	n	u
AFAC endorsed Inter-agency CAD Electronic Messaging System Specification (ICMS) version 4.2 released March 07	y	y	y	y	y	n	n	u
AFAC endorsed OASIS Common Alerting Protocol (CAP) Version 1.1 - local	y	y	y	y	y	y	y	u
IEEE standard 15222 Guide to the IEEE 1512™ Family of Standards	u	u	y	u	u	u	u	u
IEEE Std 1512-2000 (Base Standard)	u	u	y	u	u	u	u	u
IEEE Std 1512.1-2003 (Traffic Management)	u	u	y	u	u	u	u	u
IEEE Std 1512.2-2004 (Public Safety Standard)	u	u	y	u	u	u	u	u
IEEE Std 1512.3-2002 (HAZMAT Standard)	u	u	y	u	u	u	u	u
IEEE Std 1512a-2002 (Emergency Management Data Dictionary)	u	u	y	u	u	u	u	u
Emergency Alerting System (EAS) - dedicated pager messaging system using 212 radio transmitter used by	y	y	y	y	y	n	u	u

emergency services, CFA volunteers, Vic SES, Ambulance (rural)								
Emergency Management Australia (EMA) Glossary	y	y	y	y	y	n	n	u
IRS XML	n	n	n	n	n	n	y	n
Building Code of Australia	u	u	y	n	n	n	n	u
NIEM	n	n	n	n	n	y	n	u

ANSI-D20	n	n	n	n	n	y	n	u
ANSI-NIST	n	n	n	n	n	y	n	u
APCO	n	n	n	n	n	y	n	u
ATF	n	n	n	n	n	y	n	u
DEA	n	n	n	n	n	y	n	u
DOD JCS pub2.0Misc	n	n	n	n	n	y	n	u
DodMisc	n	n	n	n	n	y	n	u
EDXL	y	y	y	y	y	y	n	u
EDXL-CAP	y	y	y	y	y	y	n	u
EDXL-DE (Distribution Element)	y	y	y	y	y	y	n	u
FBI XML	n	n	n	n	n	y	n	u
FIPS10-4	n	n	n	n	n	y	n	u
FIPS5-2	n	n	n	n	n	y	n	u
FIPS6-4	n	n	n	n	n	y	n	u
HAVE	n	n	n	n	n	y	n	u
HAZMAT UN Code	u	u	u	u	n	y	n	u
ICISM	n	n	n	n	n	y	n	u
ISO3166	n	n	n	n	n	y	n	u
ISO4217	n	n	n	n	n	y	n	u
ISO639-3	n	n	n	n	n	y	n	u
ITIS	n	n	n	n	n	y	n	u
LASD	n	n	n	n	n	y	n	u
MMUC	n	n	n	n	n	y	n	u
MN offense classification	n	n	n	n	n	y	n	u
NGA	n	n	n	n	n	y	n	u
NLETS	n	n	n	n	n	y	n	u
NIEM Non Auth Classification	n	n	n	n	n	y	n	u
PostCanada (Province Codes)	n	n	n	n	n	y	n	u
SAR	n	n	n	n	n	y	n	u
TWPDES	n	n	n	n	n	y	n	u
UCR	n	n	n	n	n	y	n	u
UNeceRec20	n	n	n	n	n	y	n	u
USPSstates	n	n	n	n	n	y	n	u
UToffender	n	n	n	n	n	y	n	u
NIEM Geospatial Adapters	n	n	n	n	n	y	n	u
GDML	n	n	n	n	n	y	n	u
ISO1030328	n	n	n	n	n	y	n	u
ISO639-2b	n	n	n	n	n	y	n	u
ISO-639-2t	n	n	n	n	n	y	n	u
IFCXML	n	n	n	n	n	y	n	u
LandXML-11	n	n	n	n	n	y	n	u

Key
N = No
Y = Yes
U = Unknown

6.3 Conclusion

The ABS Project Team suggest that the Advisory Group and Steering Committee assess the importance of commonalities and differences in definitions, standards and classifications used in various systems.

For example, two approaches that need to be checked are an exchange based approach, and a registry based approach to examine classifications. This should include a way to control the management of a 'live' classification which in modern contexts have shown to be an information exchange of multi-domain classifications and standards.