



***Lessons Learned in the Development of the US  
Interagency Wildland Fire Lessons Learned  
Center***

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## Executive Summary

Professor Geoff Cumming and Dr Mary Omodei of the La Trobe University Bushfire CRC Safety in Decision Making and Behaviour Project visited the US Interagency Wildland Fire Lessons Learned Center (LLC) in July 2006 and October, 2006, respectively.

One of the aims of these visits was to consult with senior management of the LLC to identify issues and lessons that might inform the development of a lessons learned function for the Australasian fire community as part of The Fire Knowledge Network Project in the Bushfire CRC.

The LLC is an interagency program supported by the five US federal land management agencies. They have a liaison charter with the National Wildfire Coordinating Group (NWCG) which draws its membership from the federal and state fire agencies.

Although originally proposed as a center to focus on firefighter safety, early surveys of the firefighter community indicated a desire for The Center to take a more 'holistic' approach, especially by looking more broadly at organizational learning and organizational culture.

Now, five years after its commencement, the LLC's major activities are focused on the following:

- Continued enhancement of an interdisciplinary on-line community center as a professional collaboration site to assist wildland fire work groups to identify one another, share learning opportunities, discuss issues or concerns, and exchange knowledge.
- Providing intra/inter-team support for incident management teams (IMTs) through an on-line team center <http://www.imtcenter.net/>.
- Offering collections of practical and effective practices as toolkits for the wildland fire community
- Continuing to improve public relations and marketing strategies about the purpose and mission of the LLC to a wider audience in the wildland fire community

Feedback from stakeholders and the wildfire community generally (December 2006), suggests that the LLC has been successful in (a) staff quality (professionalism and responsiveness to the field) and (b) customer service and product quality.

Many of the issues that arose and were addressed by the LLC staff in the early phases of start up (in 2002) have implications for similar endeavours in the Australasian fire community. The following priorities, in no particular order of importance, are suggested:

- Obtain as wide a range of skills as possible including:
  - knowledge of fire and firefighting
  - team building skills
  - skills in encouraging agency uptake of any learnings identified (i.e., technology transfer skills)
- Adopt a relatively flat management structure
- Create an online presence as quickly as possible by developing an easy to navigate website
- Survey user populations for perceived needs and expectations of a lessons learned centre
- Benchmark against other lessons learned centres (such as the Army)
- Collect After Action Reviews and incident level summaries (AAR Rollups) as an inexpensive, yet dramatic way to begin building a learning organization
- From the outset, establish independence for the centre from the political infrastructure of wildland fire organizations
- Select as early targets for centre activity goals and objectives known to be held by key persons in fire agencies who have already identified themselves as champions of the LLC concept
- Start 'smart' with a focus on small, achievable, goals
- Do not expect lessons identified by the LLC to be immediately integrated into training curricula
- Create strong reciprocal links with the centralized fire research and training facility, including co-location of facilities
- In order to extract the full range of lessons to be learnt have multiple analysts, each with a different perspective, review the materials collected

Many of the current linkages and activities of the LLC are worthy of consideration by those charged with the development of a similar lessons learned function for the Australasian fire community, together with an awareness of any difficulties encountered (and overcome) in the development of the US centre. These recommended linkages and activities include the following.

- Involve Fire Agencies in determining LLC activities, but ensure that all decisions about directions taken by the LLC are independent of control by Fire Agencies.
- Create strong reciprocal links with wildfire training departments
- Facilitate the development of a learning culture within fire agencies.
- Wherever possible, Subject Matter Experts (SMEs) should be actively recruited for input into LLC activities, particularly with respect to the selection of material for the LCC database and the extraction of lessons to be learnt from any materials obtained.

- Establish mutually beneficial links with universities and other research bodies. This would allow for direct access to those with expertise in relevant scientific disciplines and in research methodologies, together with the opportunities to involve doctoral research students in the center.
- Actively seek out partnerships with other organizations with common aims to those of the LLC
- A central activity of the LLC is the deployment of “Information Collection Teams” (ICTs) to gather data and make observations on important issues and near misses, noting however that deployment of an ICT to an incident in which there has been a serious injury or fatality is avoided, and stressing the importance of fully honoring all commitments to confidentiality that are made to interviewees.
- In addition to distributing any lessons learned as widely as possible within the relevant fire communities and posting lessons via a centre website, active steps should be taken to promote and monitor the extent to which these lessons are disseminated, and the extent to which they are implemented.
- As the center and its services becomes more widely known and accepted, more proactive attempts at getting lessons out to the fire community can be initiated. Note, however that this is likely to lead to increased requests from agencies such that the persons that make up the center staff will face a greater need to prioritize such requests.

Several more general recommendations have been made by the staff of the US LLC for consideration by other groups intending to develop a lessons learned function for their communities. These recommendations comprise:

- Adopt an organizational structure that prevents the centre from becoming entrenched in a governmental or organizational bureaucracy. This is necessary to facilitate a free flowing exchange of knowledge as lessons and effective practices.
- Ensure that the analysis component of the centre is adequately staffed so the information that is collected or submitted can be analyzed in a timely fashion to share with the users.

In conclusion, the close contacts that have already been established between Australia and New Zealand Bushfire CRC personnel and the US LLC provide a strong basis for building a partnership that includes the development and maintenance of mechanisms which allow for the mutual transfer of learnings.

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## 1. Background to the Present Report

One of the key components of the Bushfire CRC's The Fire Knowledge Network (TFKN) initiative is an Australasian Centre for Lessons Learned (ACLL) function. Fire and land management agencies and researchers in Australia and New Zealand are aware of the Wildland Fire Lessons Learned Center (LLC) in the US and view it as evidence of best-practice in learning from past experiences. In developing an ACLL as part of the TFKN an important part of this process is to learn from the experiences of the LLC.

Professor Geoff Cumming and Dr Mary Omodei of the La Trobe University Bushfire CRC Safety in Decision Making and Behaviour project visited the US Interagency Wildland Fire Lessons Learned Center (LLC) in July 2006 and October 2006, respectively. These visits were in response to invitations from Paula Nasiatka (LLC Center Manager) and David Christenson (LLC Assistant Center Manager) to visit The Centre to workshop the research methods developed by the Melbourne-based Complex Decision Research Group (CDRG) of which Professor Cumming and Dr Omodei are members. What was of particular interest to the LLC was the suitability of the CDRG research methods for conducting research into operational decision making in the control of wildfires. Briefly by way of background, these methods include (a) Head-Mounted Video Cued Recall, (b) the Networked Fire Chief firefighting simulation program, and (c) the Human Factors Interview Protocol, developed under funding support from the Bushfire CRC.

These visits were also seen as an opportunity for Geoff Cumming and Mary Omodei to represent the Bushfire CRC by consulting with senior management of the LLC to identify issues and lessons that might inform the development of an Australasian body to provide a lessons learned function for the Australasian fire community. The present report outlines the outcomes of this consultation process.

Following Geoff Cumming's verbal report to the Bushfire CRC on the outcomes of his initial visit, Mary Omodei was given a detailed briefing by Dr Richard Thornton (Research Manager for the Bushfire CRC) and Lesley Crombie (Manager, Knowledge Networking for the Bushfire CRC) on additional issues to raise with senior management of the LLC in her subsequent visit to the LLC.

The present report includes information provided to Geoff Cumming and Mary Omodei by Paula Nasiatka (Center Manager) and David Christenson (Assistant Center Manager) during their respective visits to the Wildland Fire LLC, supplemented with corrections and additions subsequently provided by Paula Nasiatka and David Christenson in commenting on earlier drafts of this present report.

**Note:** *Although the majority of the information in this report comprises information provided by Paula Nasiatka and David Christenson, brief additional comments are offered by the author (a) where material may not be familiar to the Australasian fire community and/or (b) to draw attention to the*

*possible implications of the information for the establishment of an Australasian Centre for Lessons Learned. All such author comments are presented in italics.*

The report is structured as follows:

- (a) An overview of the LLC's origins, structure, and major products and services
- (b) Issues encountered in early phases of start up which may have implications for the development of an Australasian lessons learned function
- (c) Current LLC linkages and activities which may have relevance and implications for the development of an Australasian lessons learned function
- (d) Emerging difficulties and new initiatives
- (e) Possibilities for Australasian content

## **2. Overview of Wildland Fire LLC**

(From the LLC Website)

### **Our Mission**

The Wildland Fire Lessons Learned Center actively promotes a learning culture to enhance and sustain safe and effective work practices in the entire U.S. wildland fire community.

The Center provides opportunities and resources to foster collaboration among all fire professionals. We facilitate their networks, provide access to state-of-the-art learning tools, and bridge the gap between learning and training.



### **Objectives**

1. Improve Performance, Safety and Efficiency
2. Improve Organizational Learning
3. Share Knowledge
4. Promote Organizational Change

### **How We Operate**

1. Collect and analyze observations
2. Retain knowledge of lessons learned and effective work practices
3. Transfer knowledge and information
4. Incorporate lessons learned into the wildland fire training curriculum

### **3. Justification for Establishing the LLC**

The Tri-Data Corporation conducted an external examination of the entire US wildland fire community safety program after the 14 fatalities in the South Canyon Fire in 1994. This examination, the Wildland Firefighter Safety Awareness Study, identified a need for a national interagency Wildland Fire Lessons Learned Center. The Business Practices Re-Engineering Process group examining the former National Advanced Resource Technology Center (now the National Advanced Fire and Resource Institute) came to a similar conclusion at approximately the same time.

A related recommendation of the Safety Awareness Study was that a National Leadership Program be developed and that the business of training for all levels of leadership be closely linked to a National Lessons Learned Center. The National Advanced Fire and Resource Institute (NAFRI), was already established as a national graduate-level centre for training in fire management, strategic planning, and incident management skills. Multi-level leadership course modules have been developed for inclusion in training courses. Some of these are currently provided by a consulting company, Mission Centered Solutions - director Lark MacDonald.

To facilitate knowledge transfer to training, the LLC is therefore located in the NAFRI premises in Tucson, Arizona

The genesis of the LLC was based in firefighter safety. However, initial surveys of the firefighter community established that they wanted the center to take a more 'holistic' approach by looking more broadly at organizational learning and organizational culture. The view was that becoming a learning organization inherently meant that the community would continually grow to be safer. The LLC looks not just at firefighter productivity or efficiency as end products, but also at an organization's flexibility to adapt quickly to the environment as dynamics change. That is, there is a deliberate attempt to avoid a book-keeping mentality focusing on "acres saved" and "money spent".

This LLC focus on Organizational Learning, is illustrated by the development of a first of its kind Organizational Learning (OL) survey. This initial OL survey was created by the Harvard Business School in cooperation with the Lessons Learned Center. The particular survey for the wildland fire community focuses on three groups: everyday working units (i.e. field and district offices), fire crews and incident management teams. The survey assesses what is accepted as the essential attributes of a learning organization, namely (a) a learning environment and culture consisting of a climate for learning, valuing differences, and an openness to new ideas; (b) structures and processes that facilitate learning, and (c) a leadership which communicates value and support for learning. 196 people from the Wildland Fire Community completed the survey in 2005 and additional 100 completed the final version of the survey in 2006 (see the "Learning Organization 2005 Survey Report" [http://www.wildfirelessons.net/documents/Survey05\\_Results\\_FGino.pdf](http://www.wildfirelessons.net/documents/Survey05_Results_FGino.pdf) for a report on the findings of this survey.)



**Comment:** *The OL surveys are not fire agency specific but developed to be applicable to a wide range of organizations. Should Australia and New Zealand wish to go down this route, the survey as developed and used by the LLC would require some minor rewording to make it specific to firefighting in the Australasian context. No doubt permissions would need to be sought from the Harvard Business School and/or the Wildland Fire LLC for use of the survey.*

## **4. LLC Structure**

### **4.1 Funding**

The LLC is an interagency program supported by several of the federal land management agencies. They have a liaison charter with the National Wildfire Coordinating Group (NWCG) which draws its membership from the federal and state fire agencies.

The initial recommendation was that the five federal land management agencies would each provide USD\$60,000 annually to fund five permanent positions at the LLC. Some initial reluctance to do so was attributed to agency funding limitations and expectations by some that the LLC would provide only a library service.

The five agencies are:

- Department of the Interior's Bureau of Indian Affairs (BIA)
- Department of the Interior's Bureau of Land Management (BLM)
- Department of the Interior's Fish and Wildlife Service (USFWS)
- Department of the Interior's National Park Service (NPS)
- United States Department of Agriculture's Forest Service (USFS)

Initially only the USDA Forest Service and DOI's National Park Service committed funds (both cash and in-kind services) with NAFRI being the prime provider. The DOI's BLM, USFWS and BIA have, however, contributed monies to support several project and numerous workshops sponsored by The Center. The other agencies have been unable to commit permanent staffing funds because their budgets have been very limited.

The National Park Service makes its contribution by directly funding the Center Manager position (current incumbent, Paula Nasiatka) with the Forest Service directly funding the Assistant Center Manager position (current incumbent, David Christenson).

The Fish and Wildlife Service is now discussing placing a person half time in the LLC as a research analyst (with the remaining half-time as a Safety Officer in the agency). This co-sharing of a position, with the associated cross-fertilization of input and ideas, is proposed by current LLC staff as serving as a model for the remaining two agencies to consider.

Additional funding is provided by the agencies on a project by project basis.

Congress funded a 10 Year Fire Plan shortly after the Cerro Grande escaped prescribed fire in 2000, a fire that destroyed over 200 homes near the National Los Alamos Laboratory adjacent to Bandelier National Monument (a national park). The funding was to investigate fuels, prescribed burning, mitigation, and hazard reduction. The five land management agencies (listed above) formed a National Interagency Fuels Coordinating Group to achieve this aim. This group has provided significant funding to support Achieving the Learning Organization and High Reliability Organizing (HRO) workshops sponsored by the LLC.

The Center main focus is on helping the wildland fire community to become a successful learning organization. To help achieve these goals The Center has created a dynamic Knowledge Management System for fire personnel at all levels in the wildland fire community and has also sponsored two workshops on Achieving the Learning Organization and Facilitating Effective After Action Reviews (AARs) with Learning in Action author David Garvin.

The LLC has hired a full time Fire Science Editor, through a contractor, to work with both the fire research community and the fire managers, helping them bridge their communication gap. This Science Editor is the editor of the Advances in Fire Practice section of the LLC Website. His LLC position is funded by special project monies (USD\$60,000) from the USDA Forest Service and the DOI land management agencies.

One of the sites that is searched by the LLC Science Editor for additional information relevant to the LLC is the Fire Research And Management Exchange System (FRAMES), an online system for wildland fire. Research articles and documents collated by FRAMES are stored at the University of Idaho for access by fire managers. It is primarily focused on supporting fire researchers with a place to store tools they create and an online collaboration workspace for their projects. FRAMES is a fairly political Congressional funding initiative and as such their funding may be dependent upon certain politicians remaining in their elected positions.

NAFRI and the USDA Forest Service has funded a full-time administrative support person (USD\$ 50,000), currently Brenna MacDowell, after the need was clearly demonstrated by having a temporary service employee on contract for five months. The National Park Service is currently funding a student intern for a year (USD\$ 38,000) as part of the Student Conservation Association (SCA), a non-profit organization that serves as a liaison between young people and conservation organizations

#### **4.2 People**

- Paula Nasiatka, pnasiatka@fs.fed.us, 520-799-8760
- David Christenson, dchristenson@fs.fed.us, 520-799-8761
- Brenna MacDowell, bmacdowell@s.fed.us, 520-799-8763
- Vacant SCA Intern (formerly John Artley)

### 4.3 Person Skills

**Paula Nasiatka (Center Manager)** was formerly the Chief Ranger and Acting Superintendent for Saguaro National Park in Arizona where she managed a large fire program. Paula has a background, with associated skills, in wildland fire, emergency management, and land management. She has a 26 year career with the NPS working in seven national park units. Her BSc is in Park Administration/Resource Management from Springfield College in Massachusetts.

**David Christenson (Assistant Center Manager)** has a background in Decision Support System Technology Development for Agriculture and Natural Resources management. Additional skills include technology transfer, team building, management, Geographic Information Systems (GISs), and Remote Sensing. His degrees include a Masters of Applied Geography and a BSc in Regional and City Planning from New Mexico State University.

**Brenna MacDowell** has a background in military weather forecasting and has just completed her BA degree in English at University of Massachusetts, Amherst.

**Former SCA John Artley** has a BA degree in English Literature from Manchester College, Indiana. He is currently working as a seasonal firefighter on the Coronado National Forest in Arizona.

## 5. Major LLC Products and Services

The overall aim of the LLC is the provision of resources to help the wildland fire community improve in organizational learning. The principle mechanism by which this learning is promoted is through the development of Communities of Practice (CoPs) within fire agency communities. A CoP is an informal group of people with similar work-related activities and interests, who deepen their knowledge and expertise by interacting on an ongoing basis.

Now, five years after its commencement, the LLC's major activities are focused on the following:

- (a) Improving community of practice (CoP) network capacities through the development of an interdisciplinary on-line community center <http://www.myfirecommunity.net/GuestHome.aspx> . This is a professional collaboration site for wildland fire practitioners developed to assist wildland fire work groups to identify one another, share learning opportunities, discuss issues or concerns, and exchange knowledge.
- (b) Providing intra/inter-team support for incident management teams (IMT) through the on-line team center <http://www.imtcenter.net/>. This online team center is being developed for all teams working in the wildland fire community. Having the LLC host such a site for team sharing overcomes the bottleneck inherent in otherwise requiring each team to have their own webmaster. The team-specific

functions which are being implemented in this site include rosters, individual availability, and online messaging.

- (c) Offering collections of practical and effective practices as toolkits for the wildland fire community
- (d) Continuing to improve public relations and marketing strategies about the purpose and mission of the LLC to a wider audience in the wildland fire community

Detailed information on all LLC products and services is available on the Wildland Fire LLC Website.

No charges are made for LLC services with the exception of nominal charges for the LLC learning DVDs that are now distributed through Custom Recording and Sound in Boise, ID.

## **6. Evaluation of LLC Activities**

In 2006 a strategic planning survey was sent out to 250 stakeholders, several of whom were from Australian fire services. Feedback from stakeholders, and the wildfire community generally, suggests that the LLC has been successful in (a) staff quality (professionalism and responsiveness to the field) and (b) customer service and product quality.

## **7. Major Issues Identified in Starting up the LLC**

### **Comments:**

*A great deal of useful information and advice for consideration in setting up an Australasian Centre for Lessons Learned is to be found in the issues experienced in setting up the US LLC. Fortunately, in many cases possible difficulties in setting up a lessons learned centre were identified ahead of time and steps were successfully taken to avoid such difficulties at the start. A major factor influencing the processes adopted at the start was the appointment of an Assistant Center Manager (David Christenson) who possessed skills which complemented those of the Centre Manager (Paula Nasiatka). As detailed below David has a background in technology transfer and therefore awareness of the processes involved in getting such a centre off the ground quickly.*

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### **7.1 Skills Set.**

Some of the initial difficulties in setting up the LLC were attributed by David Christenson to his coming from outside the fire community and therefore being unfamiliar with the domain, jargon, history, and culture (including its many discontents.) These difficulties were overcome by “finding the right mix of people in setting up the LLC.” Among these persons it is important that the following skills be represented:

- (a) knowledge of fire and firefighting
- (b) team building skills
- (c) a commitment to the ethics of a “learning organization”

## **7.2 Management Structure**

A strong emphasis was placed on establishing a flat, non-hierarchical management structure for the LLC. Nevertheless, although all the LLC staff work together as a team in project identification and implementation, as well as decision-making, Paula Nasiatka, as the Center Manager, makes the final decisions (not always easy to do).

## **7.3 Website Presence**

One of the first activities undertaken to establish the LLC was the creation of an online “presence” by developing a website as quickly as possible.

## **7.4 User Surveys**

User populations were quickly surveyed for:

- (a) what they needed in a learning centre
- (b) what they wanted as high priorities in a learning centre
- (c) what they expected or hoped for
- (d) what they perceived to be the barriers to knowledge sharing

## **7.5 Benchmarking against other LLCs**

In setting up one of the major LLC functions, collections and analysis, the LLC benchmarked the Center for Army Lessons Learned (considered by many to be the best in the world.) NASA, the Department of Energy, and the U.S. Coast Guard were also consulted as the LLC was established.

A wildland fire consultant, Michael DeGrosky of the Guidance Group, Inc, worked with Wildland Fire LLC staff in designing the benchmarking visit to the Center for Army Lessons Learned in Ft. Leavenworth, KS.

## **7.6 Collection of After Action Reviews (AARs) and Rollups**

AARs were recognized by David Garvin, author of “Learning in Action,” as an inexpensive, yet dramatic, way to begin building a learning organization. AARs were already part of the Leadership Development training curriculum but only about 30 minutes were able to be given to the subject among all of the other material being taught. Insufficient training in the facilitation of AARs was identified by the LLC as a weak link in wildland fire personnel conducting AARs. David Garvin was contracted to teach at the first two LLC sponsored workshops focused on Achieving the Learning Organization and Facilitating AARs. An important aspect of AARs is that they be held at all levels, including the small unit level, and that confidentiality be maintained

An avenue for agencies or teams to send in “After Actions Review Rollups” was quickly established. A Rollup provides a single incident-level summary of the outcome of the daily AARs for that incident. Its aim is to extract from the AARs information that might be of value more generally, not just to those involved in the particular incident. Whereas AARs are conducted to provide feedback to the persons actually engaged in the incident, an AAR Rollup

provides feedback at an organizational level. The content of an AAR Rollup includes:

- (a) specific successes and challenges described so others can learn
- (b) recommendations for improving wildland fire training
- (c) as yet unresolved issues together with recommendation for the resolution of these issues.

The Rollups are de-identified and consolidated. More detailed information on AARs and AAR Rollups can be found on the LLC website:

<http://www.wildfirelessons.net/AAR.aspx>

### **7.7 Independence of LLC**

During the initial benchmarking against other lessons learned centres that Paula Nasiatka conducted in her first two months as Center Manager, she received a particularly strong recommendation that a lessons learned centre not become enmeshed in the political infrastructure of the wildland fire organizations. Experiences reported by the Center for Army Lessons Learned (CALL), highlighted the likelihood of “people in power” who authorize and finance the development of a lessons learned centre wanting to exert control over the activities of such a centre. The CALL leaders were keen to emphasize that this would be the kiss of death for a wildland fire lessons learned centre. The LLC staff was therefore determined from the outset to establish independence for The Centre. To this end the LLC established an “Advisory Group” rather than a “Steering Committee”. That is, the LLC sought to set a precedent for obtaining advice rather than for receiving orders.

### **7.8 Importance of Identifying Champions in User Agencies**

A particular difficulty encountered in the early phases of setting up the LLC was that key agencies did not want to commit funds to a LLC until it proved to be working. This was eventually seen as a blessing in disguise because it allowed the LLC to selectively target its activities by aligning with the goals and objectives of specific agencies or individuals who were already champions of the LLC concept, thus assuring the LLC of early and visible successes. Champions are fire agency personnel who have access to funds and therefore can influence, generally in a positive direction, what the LLC is able to accomplish. By way of example, the LLC chose the Great Basin area (Nevada, Utah, Southern Idaho) as an early focus because then regional fuels specialist Dave Thomas, who had emerged as a strong champion of the LLC concept, paved the way for many positive activities in this region.

What is also achieved in starting with particular champions is that the champion’s own networks also become LLC networks. By aligning LLC activities with what champions are already trying to accomplish, not only is access to agencies facilitated, but also funding more likely to be attained to support these activities. An important message here is that champions, in addition to facilitating funding support, are in a position to establish linkages between the LLC and key agency groups in such a way as to afford:

- (a) credibility
- (b) permanence
- (c) alignment with agency objectives

### **7.9 Importance of Early Small Successes**

The LLC staff emphasizes the importance of starting 'smart' by focusing on small, achievable, goals. The Wildland Fire LLC started by focusing on "fire use" (allowing naturally occurring fires to continue to burn) and "prescribed fire" (planned fire ignitions), rather than on the more difficult issues surrounding the suppression of large wildfires around the country.

### **7.10 Rate of Uptake of Lessons**

Caution was recommended against expecting any lessons identified by the LLC to be immediately integrated into training curricula, particularly in its early start up phase allowing time for agencies to become progressively exposed to its functions and services. For example, lessons identified by the LLC were not expected by the LLC staff to be immediately integrated into the National Wildfire Coordinating Group training curricula due to long course revision cycle. However, as NAFRI courses are updated yearly and new LLC content can more easily be incorporated.

***Comment:** Perhaps there are lessons here for the Bushfire CRC as a whole? That is project leaders, although being encouraged to make recommendations to agencies and to support the implantation of such recommendations, should nevertheless not expect agencies to immediately respond to such recommendations.*

### **7.11 Location of a LLC**

One of the advantages in co-locating the Wildland Fire LLC with the National Advanced Fire and Resource Institute (NAFRI) was facilitation of the transmission of lessons learned to:

- (a) graduate-level fire agency training,
- (b) grass roots levels of wider community training.

Another advantage of the co-location of a centre for lessons learned with the centralised research and training facility is the generation of a climate of acceptance for the LLC and its mission.

***Comment:** Perhaps the equivalent in Australia and New Zealand would be to locate the ACLL in the AFAC premises (but with independence from AFAC), in a major training center, or perhaps split between two of the larger training centres in Australasia.*

### **7.12 Recruitment of Multiple Analysts**

In order to extract the full range of lessons to be learnt from any activity, even (perhaps especially) in the early phase, it is important to have multiple analysts, each with a different perspective, review the materials collected. In addition to its importance in the early phase, this need for multiple analysts continues to be important for the extraction of lessons. In fact this remains the biggest current bottleneck in LLC activities (see Section 17.1 below for a more detailed discussion).

## **8. Role of Fire Agencies in Determining LLC Activities**

Early in its development the LLC established a Center Advisory Group which includes champions in Fire Agencies. Nevertheless, as emphasized in Section 7.7 above, steps have been taken to ensure that all decisions about directions taken by the LLC are independent of control by Fire Agencies.

## **9. Linkages with Training Programs**

The LLC stresses the importance of establishing close links with training departments. This starts with listening to what trainers have to say, what they believe to be the important issues, and how they believe an LLC can target the core of these issues. Steps are also taken to ensure that training departments feel some ownership of, or partnership with, the LLC. To achieve this aim, the LLC gets the drivers for what it does from the trainers (who are well connected to the real needs of the field), rather than from persons in upper echelons in the organization.

Of particular importance is the establishment of close links with the national body responsible for the provision of graduate level training for the US, the National Advanced Fire and Resource Institute (NAFRI). With a new director of NAFRI, Merrie Johnson, course steering committees are committed to explicitly looking at what the LLC has to offer by way of input to courses. For example, course leaders are also explicitly instructed to look at the LLC website for relevant teaching materials. The Advances in Fire Practice page of the LLC website has an "Instructor's Corner" <http://www.wildfirelessons.net/AFPEducation.aspx> which is intended to help increase communication between both fire science instructors and fire science students.

It is worth noting here that there is a mandatory 20% annual turnover in members of NAFRI course steering committees, which provides a mechanism for the continual injection of new ideas as well as the exposure of the many NAFRI committee members to the services provided by the LLC.

## **10. Facilitation of a Learning Approach within Agencies**

In working with individual Fire Agencies with the aim of subsequently conveying any lessons learnt to all Fire Agencies, the LLC takes advantage of any opportunity to enhance the fire agency's own approach to becoming a learning organization and to support the development of a local "lessons learned function" within the agency.

By way of illustration, near misses, including whenever fire shelters are deployed, are regarded as being of considerable interest. Such incidents have historically warranted a formal investigation by a Serious Accident Investigation Team (SAIT). As a positive indicator of the impact the LLC is having on the fire community more generally, greater advantage is being taken of the learning opportunities presented by such near miss incidents. For example, a peer review lessons learned analysis process is now being implemented by the USDA Forest Service. This review process is adopting



the organizational learning and High Reliability Organizing (HRO) approach recommended by the LLC. Furthermore, the Forest Service is now submitting the outcomes of such peer reviews to the LLC for posting on the LLC website so that everyone can learn from them. Other agencies will be invited to become more directly involved when the Forest Service has developed guidelines appropriate for the interagency wildland fire community more generally.

## **11. Role of Subject Matter Experts**

Subject Matter Experts (SMEs) are actively recruited wherever appropriate for their input into LLC activities. Many of these SMEs are identified and recruited through the links the LLC has established with fire agencies and through LLC champions. These include experts with skills in:

- (a) fire behaviour,
- (b) human behaviour (especially safety-relevant behaviour),
- (c) fire management in conservation (such as the LLC involvement with The Nature Conservancy group).

The role played by such experts includes the provision of quality assurance for LLC activities, together with suggestions as to how the LLC could best support the SMEs' respective communities/agencies.

Note – when the LLC research analyst position is funded, one of the functions of this position will be to coordinate and liaison with the interagency subject matter experts.

## **12. Linkages with Research Organizations**

The potential benefits of links between LLC staff and researchers in universities and other research-focused organizations have been recognized, although formal mechanisms to achieve such links have not yet been established. The activities involved in deriving “lessons” from ongoing activities in the real world is essentially a research process. Therefore any lessons learned centre can be expected to benefit from access to researchers with expertise in not only the relevant scientific domains but perhaps more importantly in the associated research methodologies. For example, the extraction of lessons from the vast tracts of interview material collected by Information Collection Teams and possibly other data such as AAR Rollups, could take advantage of current best practice in social science qualitative data analysis methodologies. Such links would be of considerable mutual benefit in that academics and their higher-degree students are often keen to develop and test their methods and theories in real world contexts. By including doctoral research students and university research staff in the ongoing activities of a lessons learned centre is one way for such a centre to capitalize on the availability of such a resource.

***Comment:*** *We are fortunate here in Australasia in that close links between fire agency ‘research and development’ units and independent research institutions, already in place prior to the Bushfire CRC, have been dramatically*

*expanded and strengthened by the Bushfire CRC initiative. Should formal links be established between an Australasian lessons learned function and the US LLC, the mutual sharing of information could be extended to include the mutual sharing of research skills and techniques. For example staff in the LLC have already expressed interest in the methods developed for use in the BCRC "Safety in Decision Making and Behaviour" project and acknowledge the potential benefits of developing links with academic researchers and their students more generally,*

### **13. LLC Partnerships**

Here again the champions of the LLC within agencies have helped to identify and to set up partnerships. These partnerships have included the:

- (a) National Interagency Fuels Coordinating Group
- (b) Wildland Urban Interface working team
- (c) Fire Environment working team
- (d) The Nature Conservancy
- (e) Fire Prevention, Education and Mitigation Group
- (f) Type 1 IMT Incident Commanders and Area Commanders group.

Also by sponsoring workshops such as the High Reliability Organizing (HRO) in Wildland Fire workshops, exposure to new partners in other industries is also achieved.

The LLC continues to actively seek new partners. The Australasian Bushfire CRC through an Australasian Centre of Lessons Learned might be one such partnership leading to the development and maintenance of mechanisms which allow for the mutual transfer of learnings.

### **14. Management of Intellectual Property**

Information obtained by the LLC from fire and land management agencies or persons in those agencies is already in the public domain so issues relating to IP do not have to be negotiated for such information.

In working with consultants and contractors the LLC have developed a detailed statement of work that makes it clear from the start that whatever the contractor creates or produces belongs to the LLC.

***Comment:*** Paula Nasiatka, LLC Center Manager, has indicated willingness to be approached for a copy of this standard agreement.

## 15. Obtaining Information for the LLC Database

### 15.1 Sourcing Information

The process of involvement with, and links to, fire agencies has now evolved to the stage where agencies are now initiating contact with The Center and actively pushing information and support. Nevertheless the LLC continues to actively pursue agencies for information.

### 15.2 Criteria for Selecting Information

In order to source and select relevant papers and reports, the LLC asks the fire community to specify what they need and to identify any knowledge gaps.

Contributions sent to the LLC by agencies, and individuals working within agencies, are seen as being of particular relevance for inclusion in the LLC database.

It should be noted here that in addition to consolidating materials already available, the LLC staff also generate their own material. In addition to initiating Information Collection Teams (discussed in Section 16 immediately following) and commissioning surveys (such as the Organizational Learning survey described in Section 3 above) the LLC also generates learning material by preparing educational DVDs (such as the fire behavior analysts' Dude Staff Ride to illustrate the staff ride training concept and Burn Boss Stories to share burn boss lessons and effective practices.

The LLC staff check everything for relevance prior to adding it to the LLC database. Special care is taken to screen out anything which includes an advertisement, including any advertisement for contract services.

In considering how this selection process might be further enhanced, a strong recommendation by the LLC staff was that specialist analysts be involved in the process from the beginning. In addition to advising on the selection and acquisition of maximally relevant material, such analysts could facilitate the process of sourcing additional documents and then become involved in the preparation of integrative summaries of sets of related documents so obtained.

***Comment:*** *In establishing an ACLL for Australia and New Zealand, perhaps a group of specialist analysts could be identified, some of whom should be familiar with local (i.e., Australian and New Zealand) conditions. Moreover some mechanism for allowing such analysts to be involved in all aspects of ACLL is likely to be of considerable benefit. One possibility is to include such persons in whatever advisory group function is established for an ACLL*

## 16. LLC Information Collection Teams (ICTs)

### 16.1 Nature and Purpose of ICTs

**Comment:** *The reader is referred to the LLC website for detailed information on the composition and function of Information Collection Teams, including the full protocol that has been established for use by such teams.*

Information Collection Teams (ICTs) are used to gather data and make observations on a variety of issues that are identified through the Wildland Fire Lessons Learned Center. An ICT comprise three or more persons.

By way of illustration, the LLC is currently involved in three ICT efforts:

- (1) The LLC is using an ICT to interview six Type 3 Incident Management Organizations (IMOs) regarding their successful and effective practices. This specific ICT is focusing on these relatively new but very effective small organizations around the country that are generally set up within a county or state. Two on-site interviews have been conducted using a focus group interview methodology, followed up by individual interviews. The final four IMO command and general staffs will be interviewed over the telephone.

**Comment:** *IMOs are equivalent to Australian IMTs, however Type 3 incidents are equivalent to our Type I incidents, that is they are small, with Type I being the highest incident ranking in the US.*

- (2) Another ICT travelled back to the Southern US to collect tactical hurricane lessons and effective practices (following Hurricane Katrina). This is a follow up effort, the first being in 2004 to generate a strategic level initial impressions report. This recently completed ICT gathered over 200 tactical level tools that will benefit IMTs and individuals receiving hurricane assignments. This ICT hurricane response toolbox is available on the LLC Website in the Incident Toolbox > All Hazard Response page.
- (3) Another ICT is currently collecting lessons learned from significant prescribed fire escapes and near misses between 2003-2006. The lessons gained from this ICT are aimed at helping fire management personnel use the HRO principles in planning and implementing their prescribed burn projects.

### 16.2 Funding of an ICT

There are various mechanisms for funding an ICT. The National Park Service has funded 2-3 ICTs each year. Sometimes the IMT for a particular incident requests that an ICT be activated. In this case the funding comes from the emergency funds allocated for the management of that particular incident.

**Comment:** *An analogy in Australia would be the use of Section 44 funds allocated to multi-agency incidents in NSW*

### 16.3 Decision to Deploy an ICT

The staff of the LLC makes the final decision as to the deployment of an ICT. The champions of the LLC in agencies play a key role in informing a LLC decision to deploy an ICT. Now that the LLC is more widely recognized as an interagency effort, it is more frequently being notified of opportunities to deploy an ICT (or requested to conduct same).

By way of illustration, one of the reasons the LLC focused on prescribed fire during the startup years was because many fire leaders were frustrated that the fire community kept making the same mistakes resulting in fire escapes. These leaders approached the LLC and asked for assistance. Focusing on providing the prescribed fire community with LLC support systems at a time when hazardous fuels reduction is a national high priority, was considered by LLC staff to make good sense.

In identifying incidents for deployment of an ICT, the LLC looks more broadly than just at fire incidents, sometimes taking an "all hazard response" in seeking to identify lessons and effective practices. This is illustrated by ICT deployments to the Southern U.S. post Hurricanes Katrina and Rita.

Quoting from the LLC's Initial Impressions report: [2004 Hurricane Response: Initial Impressions Report \(IIR\) from Hurricanes Charley, Frances, and Ivan](#) (1 MB PDF posted 122304): "Between August 12 and September 26, 2004, six tropical weather systems made landfall on the shores of the southeastern USA. ...Over the two-month period stretching from mid-August through mid-October, approximately 1,900 personnel from the wildland fire community were committed to this hurricane response effort... "

The purpose of this collection effort was to inform the preparation of future all-risk response teams, gather information for training, document agreed upon best practices, identify knowledge gaps, and illuminate issues of *strategic or organizational significance*. It focuses on the data collected during an eight day "snapshot" while the ICT was on site..."

Lessons from Katrina and Rita (New Orleans and Gulf Coast region) is a current ICT collection effort sending a team to the southern states November 27-December 2, 2006.

### 16.4 Membership of an ICT

Membership of an ICT comprises:

- (i) At least one of the Center Managers (at present, Paula Nasiatka or David Christenson)
- (ii) A wildland fire contractor (often a retired fire-related subject matter expert) is recruited and paid from funds allocated for the ICT to (a) act as an independent contributor and (b) write up the ICT report. Contractors have also been sourced from specific external contracting agencies such as Mission-Centered Solutions (website: <http://www.mcsolutions.com/>). The LLC is continuing to build up a pool of contractors to draw upon as needs arise.
- (iii) A person with local knowledge, usually contributed and funded by an agency in the region involved. This is a relatively straightforward

matter as the particular region involved can be expected to gain most from such an ICT.

### **16.5 The ICT Interview Process**

What is of most interest to the persons comprising an ICT is what the respondents were thinking and feeling at the time of the incident, and what they believe to be more significant aspects of that incident. The LLC has developed a particular interest in identifying and describing what are described as “portal experiences”, experiences in which people have transitioned from one way of thinking and behaving to a new way of thinking and behaving.

#### **Comments:**

*The term “portal experience” was used in an article by Paul Chamberlin in the USFS Fire Operations Safety Council newsletter “SAFETY ZONE” (<http://www.fs.fed.us/fire/safety/council/>) and subsequently presented at the 8<sup>th</sup> Wildland Fire Safety Summit – The Human Factors Workshop - 10 year later, Missoula, 2005 [Portals: An Engaging Discussion Regarding a Fire Professional’s Maturity and Commitment to Safe Practice](#) (Paul Chamberlin)*

*As summarised by Dennis Talbert, “career firefighters usually pass through a ‘Portal’ of sorts, a Safety Awareness Portal, achieving new perspectives, their reality altered. Transiting the Portal can be painful, maybe physically, always emotionally. They are often related to traumatic events such as South Canyon, Mann Gulch, Thirty Mile, Cramer, or a less legendary incident; perhaps a close call, or a personal Waterloo. Transiting a Portal is a deep and absolute process; it is career changing. After transiting the Portal, complacency or sloppy decisions are buffered by deeper insight... Our human tendency to rationalize, succumb to peer-pressure, or miss incremental changes is restrained”*

### **16.6 Use of Information Obtained by an ICT**

The many interviews collected daily as part of the ICT process are scanned for possible important themes and to inform the content of an initial impressions report. It is recognized that an ICT generates a snapshot in time and is not designed to provide a comprehensive examination of all the issues involved. It is worth noting, however, that an important outcome of an ICT is the identification of needs and opportunities for follow up work.

As soon as possible after each interview is completed, the interviewer types up his/her interview. These interview transcripts are sent on a daily basis to the contractor assigned to the ICT. This mechanism provides an opportunity for an ICT to evolve with considerable flexibility so as to best identify and take advantage of any windows of opportunity that present themselves.

The contractor then produces an integrated draft report which is circulated to all members of the ICT for comment. After a series of drafting stages and a review for accuracy by the hosting agency, a final initial impressions report is published as well as being made available on the LLC website.

The LLC also takes proactive steps to notify persons and agencies that are likely to be interested in the report of its availability.

### **16.7 Interaction with any Formal Judicial and Other Enquiries**

An ICT is totally independent of any formal enquiry. The detailed information obtained during an ICT is not shared with agencies or with any groups appointed to conduct a formal enquiry.

The LLC avoids deploying an ICT to an incident in which there has been a serious injury or fatality and therefore the issue of having to delay the deployment of an ICT has not arisen to date.

So far there have been no ICT deployments to incidents that have been subsequently subjected to a formal legal investigation.

The credibility of the LLC to conduct ICTs depends on the extent to which the ICT members are able to honor any commitments to maintain confidentiality that they make to interviewees. Nevertheless, demands to release information obtained by an ICT have occasionally come from members of other investigating or review groups. This is usually from persons in agency bodies subsequently charged with conducting internal lessons learned investigations and who anticipate that the ICT-generated interview notes will expedite this process. The LLC, in acknowledging that the information they have collected might be of such assistance, stress that the release of such information threatens the integrity of the ICT process by failing to honor commitments to preserve confidentiality. As a result such demands for interview information are vigorously rejected by members of the LLC. This may not be viewed favorably by agency managers but the safeguarding of interviewee confidentiality is appreciated by the firefighting community.

***Comment:*** *David Christenson was keen here to explore the processes adopted in the Bushfire CRC to afford confidentiality to interviewees.*

If a legal request for information is made of the LLC, this request is referred to the relevant fire agency. The aim in activating an ICT is not to conduct a detailed review of the incident overall, but for firefighters to be able to say “here is what we think other firefighters should know.” In doing so the LLC is therefore able to bypass much of the detail of who did what, including the sorts of detail which would be most likely sought by persons conducting a legal enquiry. In an ICT interview the people being interviewed are encouraged to focus on what, not who. Considerable care is also taken to clarify that an ICT is not an “investigation team.”

## 17. Processes for Maximising the Learning of Lessons

### 17.1 Extraction of Learnings

Lessons are often explicitly articulated in reports submitted to the LLC (such as in the AAR Rollups). LLC staff also requests SMEs to identify problems, learnings, and effective practices in the material collected by the LLC. As briefly mentioned in Section 7.12 above, one of the remaining important issues to be satisfactorily addressed in the LLC is the need for multiple analyses of incidents in order to fully identify and extract all the important lessons to be learned. This represents the biggest current bottleneck in LLC activities. What are required are SME analysts who can apply multiple perspectives. For example, there is a need for analysts who can help with identifying leadership issues, as well as analysts who can apply a human factors perspective. What such experts provide is an ability to “read between the lines” of the information that has been collected.

The LLC staff recognize the importance of not making claims or inferring lessons that go beyond their own level of expertise. Particular vigilance is needed here to protect the LLC from being shown to be fraudulent in extrapolating information beyond that which the data provides, but instead working with the SMEs to derive the real value to be gained.

**Comment:** *One of the positive outcomes of the Bushfire CRC is the identification and further training of a group of experts qualified to comment on a wide variety of issues of concern and interest to the fire community.*

### 17.2 Dissemination of Learnings

The LLC posts any learnings on its website as soon as possible. A heartening sign of success here is that there are on average distinct 500 visits to the LLC website each day and many of these are to view and download new learning material.

In addition to website postings, lessons identified by the LLC are distributed as widely as possible within the relevant fire communities through various mechanisms. These include The Center’s two newsletters, the Scratchline and the Learning Curve.

The Scratchline comes out quarterly and is the signature knowledge transfer tool. Scratchline newsletters aim is to inform the wildland fire community in a fast and simple format of lessons and effective practices that are identified from After Action Review Rollups and Information Collection Team interviews. The content of these newsletters focus on tactics, techniques, procedures, and processes.

The Learning Curve is published periodically during a fire season. It presents recent succinct lessons learned and effective practices from the field, collected and summarized from After Action Review (AAR) Rollups.



This notification of lessons by way of Scratchline and Learning Curve newsletters is also followed up by making contact with LLC-identified champions in the respective agencies and with the networks to which these champions belong.

Other mechanisms for disseminating learnings include presentations at national and regional level conferences, seminars, workshops, and other meetings.

The LLC also actively solicits feedback from champions in fire agencies in order to develop a sense of how widely the lessons are being disseminated. The aim here is to avoid something useful sitting on a supervisor's desk and never reaching the unit for which it was intended.

***Comment:** There is perhaps a lesson here for the Bushfire CRC with regard to implementing mechanisms for maximizing the dissemination of its research findings within agencies. One of the many positive outcomes of the BCRC process by which researchers must secure end user support for all operational plans is that such agency persons are likely to fulfill the role of disseminating research findings.*

### **17.3 Facilitation of Uptake of Learnings**

In addition to the processes mentioned above aimed at maximizing the number of lessons extracted and their dissemination to appropriate groups within fire agencies, LLC staff also give explicit attention to identifying ways in which they can facilitate a community of practice's implementation of these lessons. This is being done through the implementation of an on line metrics survey as well as follow up telephone surveys with various user groups.

***Comment:** There is perhaps a lesson here for the Bushfire CRC with regard to implementing mechanisms for maximizing the uptake by agencies of the research findings and associated recommendations. Another positive outcome of the BCRC process by which researchers must secure end user support for all operational plans is that such agency persons are likely to fulfill the role of champions who can argue for changes in agency protocols and procedures to take advantage of research findings.*

## **18. Emerging Difficulties for the LLC**

As The Center and its services becomes more widely known, the small center staff face a greater need to prioritize requests from agencies and from individuals within agencies. The LLC uses standardized criteria to categorize such requests into: Must Do, Should Do, and Nice To Do.

## **19. Strategic Plan**

Taking note of the outcome of the strategic review of LLC Road Map and extensive activities and tasks list, including the outcomes of the strategic planning survey (described in Section 6 above), the first strategic planning process was initiated in October 2006. An interagency planning committee first met in December 2006 where they outlined the process for creating a LLC mission, vision and core values. As of April 2007, final draft mission, vision, core values and initial strategic goals were completed. The LLC is currently involved in holding three regional stakeholder meetings to gather input on LLC strategic goals. The planning committee will reassemble in late 2007 to finalize the strategic goals and objectives. The strategic plan for 2012 should be complete in January 2008.”

Elements of the strategic plan for the LLC will include the following priorities and new initiatives:

### **19.1 Current Priorities**

Current priorities include (a) further development in analyzing raw information and data into useable lessons and effective practices, and (b) outreach efforts to leadership teams, safety teams, compacts, etc. regarding centre efforts.

### **19.2 New Initiatives**

LLC staff is attempting to be more proactive in getting lessons out to the fire community. One such attempt is to push “a lesson from this day in history” onto the LLC website.

High Reliability Organizing (HRO) Advanced Seminars, Facilitating HRO (Train the Trainer) Workshops, and supporting multiple geographical area HRO Fundamentals Workshops are occurring with the goal of training a facilitator cadre who can teach the fundamentals workshops around the country.

Processes have been set in place to conduct interviews with Subject Matter Experts (SMEs) that aim to capture their business wisdom or critical knowledge. Such interviews, referred to as “Deep Smarts”, aim to reduce the loss of critical knowledge to an organization on retirement of senior personnel. The Center is following the model used by Dorothy Leonard of Harvard Business School and will be developing caselets and other media to transfer the deep smarts knowledge.

Fire/Public Information Officer Communities of Practice (CoPs) have been targeted for focused development efforts in 2007. This important CoP was identified since they are a direct link to agency administrators at home units and to incident commanders and deputy ICs on wildland fire incidents. They also represent an excellent conduit/liason for the Lessons Learned Center to the interagency wildland fire community with their strong verbal and written communication skills. LLC staff and the knowledge management system consultant are currently interviewing and surveying this CoP to ascertain better ways to coordinate efforts

## **20. Possibilities for Australasian Content in the US LLC Database**

If Australasian content were to be included on the US LLC database (and website) there would need to be mechanisms set in place to:

- (a) identify where such content was coming from
- (b) scope and assess the unique aspects of the Australasian conditions for applicability to North America conditions
- (c) Australasian SMEs exercising quality control over the information obtained.

The LLC sees the current interaction and interchanges with the Australian and New Zealand Bushfire CRC as being a good start toward the possible inclusion of Australasian content in the LLC databases and website, and also for mutually beneficial information exchange.

## **21. Conclusions**

The detailed information provided by the staff of the US Wildland Fire Lessons Learned Center for the compilation of this report constitutes a valuable resource for the Fire Knowledge Network Project in the Bushfire CRC which has been charged with implementing a lessons learned function for the Australasian fire community (as an Australasian Centre for Lessons Learned, ACLL).

Important factors to be taken into account in developing a successful ACLL include the need to listen to one's audience, the need to establish strong links to agencies through champions and their networks, the value of credibility gained from SMEs and the importance of aligning with education and training.

From an organizational structure perspective, it is important to ensure that the centre does not become entrenched in a governmental or organizational bureaucracy so the free flowing exchange of knowledge through lessons and effective practices can effectively occur.

From an operational perspective, it is important to ensure that the analysis component of the new center is adequately staffed so the information that is collected or submitted can be analyzed in a timely fashion to share with the users.

Furthermore the close contacts that have already been established between Australia and New Zealand Bushfire CRC personnel and the US LLC provide a strong basis for building a partnership that includes the development and maintenance of mechanisms which allow for the mutual transfer of learnings.