

**LESSONS LEARNED 2003**

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**SUCCESSSES AND CHALLENGES  
FROM AAR ROLL-UPS**



**For: Wildland Fire Lessons Learned Center  
C/O The National Advanced Fire & Resource Institute  
3265 East Universal Way  
Tucson, Arizona 85706**

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The Guidance Group provides strategic services to fire service organizations and specializes in leadership, strategy and organizational improvement. The Guidance Group provides a unique blend of real world fire management experience as well as facilitative and consulting skills that may not be available within the client organization. The result is a practical, professional and experienced approach to fire service strategy, leadership and organizational needs including strategic planning, professional development, goal setting, collaborative problem solving, program evaluation, and support to field studies and field research.

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## **LESSONS LEARNED RELATED TO AGENCY ADMINISTRATORS**

### **Relationships Between Incident Management Teams And Agency Administrators**

**Background:** Incident Management Teams (IMT) reported that working relationships with host agencies and agency administrators make or break an assignment.

#### What Success Looks Like

Some agency administrators were involved, provided excellent support and guidance throughout the incident, attended most planning meetings, and provided knowledgeable Agency Representatives that were always available to the IMT and contributed to the planning process. One agency administrator, when faced with four large fires on his unit, ordered an Agency Representative to act on his behalf at one of the fires, assuring that each team received sufficient attention from the host agency. Effective working relationships between the IMT and the host agency facilitate success.

#### What Success Does Not Look Like

Other IMTs found the relationship between the IMT and the host agency ineffective, and that the lack of relationship interfered with the success of the IMT. Problems included inadequate initial briefings, the inability to build trust quickly; difficulty in getting the host unit's attention; and excessive administrative requirements, imposed by the host, that interfered with the team's functioning.

**Lessons Learned:** An effective relationship between the IMT and the administrator of the host agency facilitates success, and the agency administrator helps set the tone of the working relationship. Hallmarks of excellent agency administrators include active involvement; support and guidance throughout the incident; attendance at planning meetings; and appointing knowledgeable agency representatives who are available to the IMT and contribute to the planning effort. IMTs and the administrators of host agencies need to establish productive working relationships immediately, in part by opening lines of communication at the initial briefing.

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## **LESSONS LEARNED RELATED TO THE COMMAND FUNCTION**

### **Span of Control for Area Command Teams**

**Background:** Area command teams (ACT) reported that maintaining an effective span of control provided their most difficult challenge. For example, one ACT reported that during the first week of their assignment, the regional Multi-Agency Coordinating (MAC) Group assigned ten incident management teams (IMTs) to the Area Command. With a large number of emerging incidents in two adjoining states, and multiple in-briefings occurring every day, it soon became apparent that the Area Command would exceed an effective span of control.

The Area Command was split into two new Area Commands, with a major highway dividing the two areas of jurisdiction. The regional MAC consolidated fires under IMTs and shifted fires between Area Commands as fires came under containment or conditions dictated. Eventually the MAC decided to consolidate all the fires back under a single ACT, and shift the remaining team to another part of the region to assume command over fires not benefiting from Area Command support.

**Lessons Learned:** Area command teams need to look for weaknesses in the coverage of incidents within and near their command, remain flexible, and be willing to make changes that are in the interest of their host agencies. Area Command and MAC Groups need to ensure that they do not exceed the Area Command's effective span of control by assigning too many incidents/IMTs to the Area Command.

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### **Establishing Working Relationships With Other Agencies**

**Overview:** IMTs stressed the importance of effective interagency relationships, and point to their ability to establish and maintain effective working relationships with interagency cooperators as notable successes in four different circumstances; including the Space Shuttle Recovery Effort, when cooperating with local government, when cooperating with state and provincial agencies (and their cooperators), and when facilitating cooperation between agencies.

#### **1. Space Shuttle Columbia Recovery Effort**

**Background:** Teams assigned to the recovery effort reported that the working relationships that developed between their IMT and the personnel of the Environmental Protection Agency (EPA), National Aeronautical and Space Administration (NASA), FEMA Disaster Field Office (DFO,) and the Texas Forest Service (TFS) improved understanding of agency-specific missions and contributed to effective, coordinated operations.

Interagency communications represented a key facet. One IMT established relationships and protocols that caused information to be passed from agency to

agency on issues affecting the incident. Consequently, cooperators spoke often and at length to ensure that each agency's needs were addressed. This provided not only for a smooth transition when another IMT assumed command, but strengthened the relationships between cooperators as time progressed.

Other teams credited unified command for their interagency success. One team established unified command even though the delegation of authority indicated a single command structure, because the delegation of authority included three distinct mission objectives. At least one IMT integrated local government agencies into the team, allowing them to take advantage of local expertise to accomplish the incident objectives.

However, one IMT pointed out that a lack of overall strategy and coordination between branches, coupled with rapidly changing objectives, created confusion in its demobilization planning and delays and inefficiencies in resource allocation. According to this IMT, the situation could have been alleviated if the recovery effort had carried the Incident Command System (ICS) organization one step further by instituting an Area Command to unify all agencies under a single command structure.

Other IMTs, found that the multitude of agencies involved, their individual missions and the range of organizational structures did not align with the concept of unified command that they normally expect when using the ICS. The unfamiliar approach to unified command resulted in a steep learning curve, and a challenge to coordination between the branches, between agencies and the DFO, and confusion over protocols and authorities involved in various aspects of managing the incident.

## 2. Cooperating with Local Government

**Background:** Numerous IMTs had the opportunity for extensive contact with agencies of local government during the 2003 fire season, and cited their ability to establish and maintain effective working relationships with representatives of local government as their most notable success.

### What Success Looks Like

On one incident, the relationship that developed between the IMT and the County Commissioners established a foundation that the host agency can continue to build on. On another fire, the issue of fire damage to the municipal watershed provided an opportunity for team members with background experience in this area to work alongside county officials to identify possible assistance programs for the community.

Other IMTs found local sheriff's departments to be excellent cooperators, providing accurate and timely evacuations and working closely with the IMT. At

these incidents, sheriff's deputies were assigned to work with the IMT and attended most planning meetings and briefings throughout the incident. One IMT developed a Unified Incident Agreement with the County to spell out how the IMT and the County would function together in unified command. In that instance, the IMT tasked their Liaison Officer with negotiating the agreement with the County. Ultimately the Liaison Officer's involvement and the Unified Incident Agreement improved the effectiveness of unified command. Other IMTs conducted joint planning with county officials, including contingency planning and population protection planning, even when they were not formally in unified command.

At another incident, the IMT reported that a particularly progressive county had previously conducted emergency management training simulations involving large incident scenarios. According to the IMT, the County's training obviously helped prepare county officials, as evidenced by the efficient joint contingency planning conducted between the IMT and County personnel. In other cases, the cooperative effort represented the first time that county personnel had completed such plans.

#### What Success Does Not Look Like

As would be expected, not all contact between IMTs and agencies of local government was positive. One IMT reported that working with the County Emergency Management Coordinator (EMC) and local fire departments presented their greatest operational challenge. Questions regarding jurisdiction and the role of the IMT became an issue during structure protection decisions, and those questions never were resolved. While the IMT respects the role of local fire districts to protect private property, they observed that structure protection was never in place on the scale necessary to adequately protect hundreds of threatened homes. The IMT reports that, at times, no one represented the EMC at planning meetings or operational briefings, mainly because the EMC was overwhelmed by the scope of his responsibilities. The EMC and his resources located themselves at their own ICP, even though the host agencies and the County were in unified command. Excellent cooperation between the IMT and the County Commissioners helped resolve some problems.

#### 3. Cooperating with State and Provincial Agencies (And Their Cooperators)

**Background:** Both IMTs and agency resources at the local level cited the importance of effective interagency working relationships with State and Provincial agencies. Several IMTs cited their experience working closely with state departments of forestry or natural resources as notable successes.

Reciprocal agreements between the USDA Forest Service Pacific Northwest Region, the Colville National Forest and the British Columbia Forest Service facilitate joint actions to be taken on incidents located along the U.S. and

Canadian Border. In one example, a U.S. IMT operated in unified command with a Canadian Provincial agency and a Canadian municipal fire department, with good results. On this incident, a fire on the U.S. side of the border threatened a community in British Columbia. The agreement helped to delineate operational and fiscal responsibilities, allowed the IMT to unify command with Canadian agencies, and enabled the team to assign operational branches to the Canadians. With joint planning, the IMT was more effective at using the resources available to them; and produced one, common plan that provided a higher degree of safety and effectiveness to the operations.

However, the IMT reported that it took time to develop a sufficient level of trust between the IMT and their Canadian counterparts. Both the Delegation of Authority and the Incident Action Plan (IAP) listed objectives to protect both U.S. and Canadian citizens and property; and trust developed as the IMT demonstrated that they were taking sufficient action to protect Canadian resources. Provincial fire managers were involved in developing a common plan, made daily input, and monitored operations. According to the IMT, this kind of participation and documented priorities proved to be very helpful when working both with the media and the threatened community.

Another IMT pointed to reciprocal agreements for fire support between states as an important relationship for IMTs to understand. The team reported on a situation in which, the State of Minnesota had loaned two CL-215 aircraft to the State of Montana because of the severity of Montana's fire season. One complex of fires, managed by this IMT, was very near a major river and reservoir and presented an unlimited supply of water and short turnaround time for aircraft. The IMT used the CL-215s, and the planes were a great help in holding parts of the fires until the IMT could get ground resources in place. However, according to the IMT, the lesson learned is not the successful use of the aircraft, but taking advantage of the reciprocal agreement between the states.

#### 4. Facilitating Cooperation Between Agencies

**Background:** Teams cited their role as facilitators of better working relationships between agencies as major success stories as well.

One IMT assigned one of their Branch Directors as a Group Supervisor working with the Burned Area Emergency Rehabilitation (BAER) Team to work with one of the host agency's cooperators as they planned an adjacent wildlife burn. The Group Supervisor also worked with the rehabilitation group and assisted the local airshed coordinator on the burning of local fields.

Another IMT facilitated a better working relationship between a national park and the neighboring Native American nation concerning the sharing of resources for initial attack (IA). The IMT brought the two agencies together, and formed a team

responsible for IA in much of the National Park and on reservation lands. The IMT reports that it hopes this relationship will continue for future fire seasons.

An Incident Commander Type 4 (ICT4) in the lake states cited interagency cooperation between the USDA Forest Service, the State Department of Natural Resources (DNR), volunteer fire departments, and local law enforcement agencies as a notable success; citing good working relationships, developed over several years, as a worthwhile effort that is paying off. On one particular incident, the willingness of various agencies to work together under unified command enabled the organization to protect all the structures in the fire area and control the fire. This joint effort was possible due to agreements worked out in advance and the knowledge that none of the agencies can “go it alone”.

Yet another team recounted their experience working with two different Native American tribes on fires spanning two different reservations, where political differences and the relationship between the tribes became a factor. In this case, the IMT saw how a good working relationship is imperative when working for two agencies with different viewpoints. The IMT needed to establish a relationship with each agency, so that both agencies received what they wanted from the incident. At times, the situation required the IMT to facilitate compromise. Daily contact by the IC, Planning Section Chief, and Operations Section Chief was necessary to make things work in this situation.

The IMT helped build an improved relationship between the tribes by working with tribal representatives on a one-on-one basis, and by working at meeting the needs of both tribes. The IMT asked both tribes to be at the planning meetings to discuss differences, with the objective of the two tribes working together in a Type 3 organization. Representatives of both tribes were at briefings for both operational periods and talked to the personnel going out on the different fires.

#### **Lessons Learned:**

- ☀ Developing a working relationship between members of the IMT and personnel of other key agencies increases understanding of agency specific missions and contributes to effective implementation of operations. Stay flexible and adapt operating procedures.
- ☀ Success requires effective interagency and intra-team communications. IMTs should place a priority on establishing relationships and protocols that create opportunities to communicate often and cause information to be passed within the team and from agency to agency on issues affecting the incident.
- ☀ Unified command works extremely well when implemented properly, particularly when missions are complex. The roles of each participant in the unified command must be well defined and each participant must work within their defined role.

- ☀ During fires involving or anticipating evacuations, closures and public meetings, a representative of the county sheriff's office should attend most, if not all, planning meetings and operational briefings throughout the incident. Consider involving a deputy sheriff as a temporary member of the IMT. Engage the county officials including fire chief, sheriff and emergency management director in contingency and population protection planning even when not in a unified command.
  - ☀ Engage counties and rural fire districts in unified command to create a "true partnership." Use a written agreement to guide how the IMT and the County will function in unified command. Integrate local agencies into the unified command to gain the expertise of local resources in accomplishing incident objectives. Develop the organization to the extent necessary to completely unify the activities of all agencies. IMTs should look for opportunities to work with county officials, and identify possible assistance programs for the community. Counties that have planned for large-scale incidents and have trained using scenarios simulating large incidents can be well prepared to interact with IMTs.
  - ☀ IMTs need to work closely with state departments of forestry or natural resources where those agencies are "players," and recognize that IMTs should view reciprocal agreements for fire support between states as an important relationship to understand and take advantage of.
  - ☀ Local interagency cooperation between the USDA Forest Service, the state natural resources/forestry agency, volunteer fire departments, and local law enforcement agencies is critical to success in many areas. The willingness of various agencies to work together under a unified command enables operational success, particularly when agreements are worked out in advance and agencies acknowledge that no single agency can "go it alone".
  - ☀ IMTs can play a vital role as facilitators of better working relationships within and between agencies. Relationships and agreements established during the incident can have lasting positive effects.
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## **Establishing Working Relationships with Local Citizens**

**Background:** Several teams reported on their experiences creating effective working relationships with local citizens. In one case, the IMT was confronted with local ranchers engaged in their own suppression activities. Each day, these ranchers would approach operations personnel in the field, and express their view of the IMT operation, often in a hostile fashion.

The IMT kept the ranchers informed and listened to their concerns, because the team felt it was imperative to open lines of communication, explain the importance of the strategy and tactics undertaken by the IMT, and inform the ranchers of the risks they were exposing themselves to. The IMT included local citizens in the suppression effort when they were qualified to participate, and the team invited the ranchers to the daily briefings, and listened to their input.

Another IMT faced private landowners who had objectives that competed with the team's control objectives and safety concerns. To address this challenge, the IMT worked closely with the personnel of the state natural resources agency, who were familiar with the local citizens and their concerns. Working with the state personnel, the Operations Section Chief and the Safety Officers were able to ensure that the landowner's requests could be worked into fire operations in a safe manner. This approach required understanding, not only what the landowner wanted to accomplish, but also the constraints that the IMT faced. The IMT and the landowners developed the ability to integrate the landowners' needs and the IMT's requirements while ensuring the safety of all concerned.

In another situation, the IMT faced a difficult issue that endangered relations with local citizens. The IC told his team that he expected both his team members and single resources assigned to the incident to possess good interpersonal skills and demonstrate the ability to work well with personnel from outside the team, such as with the incident's local, contract drivers. However, the IMT included a single resource Equipment Manager who supervised six local drivers, several of whom were female. Apparently, the Equipment Manager, who was male, engaged in behavior, directed toward the female drivers, that the drivers and the IMT found unacceptable. Consequently, the IMT sent the Equipment Manager home. The IC invited the drivers and their spouses to have dinner with him at the ICP, and cautioned the IMT members to pay attention to their units and ensure that members of the IMT were not jeopardizing community relations by displaying inappropriate behavior. The actions taken appear to have resolved the situation satisfactorily.

**Lessons Learned:** Community relations are extremely important, and IMTs need to pay attention to community affairs. The expectation that team members will manage for positive community relations must be made clear. IMTs should take action to maintain community relations where they are good, improve relations where they can be improved, and fix community relations problems decisively and immediately when they occur. Keep local citizens informed, listen to their input and concerns, educate and inform them, invite stakeholders to operational briefings and try to make them part of the effort when possible.

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### **Effective and Efficient Team Transitions**

**Background:** Numerous IMTs reported that effective and efficient team transitions represented some of their most notable successes during 2003.

#### What Success Looks Like

One IMT reported that the transition to their team from another IMT was the best they had ever experienced. The team cited the professionalism and attitudes of the Type 1 IMT members as contributing to this success, and asserted that the successful transition set the stage for continued safe operations at the incident. This team's experience echoed that of two other IMTs who reported a great transition during the recovery effort. The teams worked together through an extended transition period that was needed to gain familiarity with an unfamiliar, non-wildfire situation and new procedures.

Another IMT was asked to take over a fire immediately following their "in-briefing," because uncertified personnel were currently leading the resources on the fireline. The IMT agreed to take the fire over after Operations had an opportunity to get on the ground and establish contact with the two volunteer fire departments fighting the fire. The IMT implemented this plan with great success, in part because the local forces, although lacking a certified Type 3 Incident Commander were well organized, well trained, properly outfitted with PPE, had common communications, posted lookouts, and had identified escape routes and safety zones.

That team's success story was similar to the experience of another IMT that reported their first opportunity to use what their team calls a "rolling start." According to this IMT, most host jurisdictions are faced with the dilemma of what to do about initial attack resources that have worked excessively long shifts prior to the IMT's arrival. This IMT uses the "rolling start" concept to more quickly transition into their first operational period once they have arrived. For example, the IMT was ordered at 1700, and since some team members were less than three hours from the incident, IMT members arrived at the incident quickly and created an IAP with the host jurisdiction for the next day operational period. The IMT in-briefed at 0600, and assumed command of the fire at 0800. They used a combination of local resources and incoming resources that had been resource

ordered that morning. The approach allowed for a smooth transition with the local IA resources, and quicker release of those resources.

Another experience demonstrates what happens when ACTs transition well. During one IMT's assignment, a transition occurred between ACTs. The transition was smooth and seamless. Impacts to the IMT were minimized during transition, and support from the Area Command to the IMT remained excellent. Critical resources were obtained for accomplishment of high priority tactics and objectives, and conference calls were scheduled and conducted for each function providing excellent inter-incident coordination.

Finally, several respondents commented on the importance of receiving a good briefing when they arrive on an incident. In one example, the orientation the IMT received and the help they received from local personnel, who they incorporated into the organization, represented two factors contributing to the team's success. According to this IMT, it is extremely important for incoming teams to listen to the local experts regarding fire behavior and logistical issues. Some respondents reported that a few key, local Administratively Determined Hires (AD) and other support personnel aided incoming teams in maintaining operational and planning continuity through their command transition.

#### What Problems Look Like

Not all team transitions went well. On one fire, a communication breakdown occurred during the transition from a Type 3 IMT to a Type 1 IMT. According to respondents, critical information about fire behavior, spot fires, completed line, and future operations was lost in the transition. The fire was burning on the jurisdictions of two agencies, and the two agencies had assembled an understaffed, ad hoc Type 3 team comprised of local personnel. The agencies decided to monitor the fire, maintain structure protection, and establish evacuation trigger points.

Communications began to break down within the Type 3 organization because the Incident Commander (IC) and the Operations Section Chief had little contact with each other over the course of two operational periods. Communication continued to degrade as members of the incoming Type 1 IMT began to arrive and interact with members of the Type 3 IMT individually. As the Type 3 IC became increasingly involved with the arriving Type 1 IMT, communications within the Type 3 IMT continued to erode. Consequently, the Type 3 Operations Section Chief, who also happened to be the Fire Management Officer of one of the local agency units, missed a strategy meeting where the decision was made for the Type 1 team to transition into command of the incident.

The Type 3 Operations Chief also lacked communication with the line officer, who was committed to the Type 1 IMT in-briefing and preparing the WFSA. Apparently, the agency administrator did not think that consultation with line

personnel was necessary because the Type 3 IC, who had not made it to the line or communicated with the Operations Section Chief, had sufficient knowledge.

According to reports, the Type 1 IMT took command of the fire without shadowing the existing operation for an operational period, and immediately shifted from an indirect strategy initiated by the Type 3 IMT over a period of days, to a direct strategy, discounting local knowledge and situation awareness in the process. The maps prepared by the Type 1 IMT, and included in the IAP, did not show the presence of spot fires that were known to exist by the Type 3 Operations Chief/local FMO. That afternoon, the fire made a run, structure protection and evacuation trigger points were reached by afternoon, and the local community was evacuated.

**Lessons Learned:**

- ☼ Effective and efficient team transitions are critically important and have direct impact on safe, effective and efficient operations. The professionalism and attitudes of the team members contribute to effective and efficient transition.
  
  - ☼ Teams need to make their transitions quickly and efficiently, but should not be rushed. Effective transitions can be accomplished by taking creative approaches to the team's protocols and procedures. Use an extended team transition period to assure success when necessary. When asked to assume command of a fire immediately, first ensure that the team has acquired complete situational awareness before proceeding.
  
  - ☼ Transition between area command teams can have an enormous impact on IMTs within the Area Command. The transition should appear seamless to the teams, impacts should be minimized, and support from the Area Command to the IMT must be continued without interruption. Consider using local Administratively Determined (AD) personnel and other support personnel to maintain operational and planning continuity through command transitions.
  
  - ☼ Good briefings are essential to good IMT performance. It is also extremely important for incoming teams to listen to the local experts regarding fire behavior and logistical issues.
  
  - ☼ As an incident situation becomes more critical and stressful, people tend to "get busy" and communicate less, when there is actually a need to communicate more. Take time to communicate. Interpersonal communication between team members becomes especially important during these times, particularly during team transitions.
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## **Strategic Thinking on Very Large Incidents**

**Background:** Numerous IMTs reported that large numbers of fires, very dry fuels and resource shortages required them to think even more strategically than usual to succeed. Teams routinely reported that, while doing their part to control large numbers of fires under very challenging conditions, resource shortages presented one of their most difficult challenges.

IMTs report that resource shortages caused them to prioritize their fires based on resource availability. For example, when faced with limited availability of aircraft and aviation personnel, one IMT scaled back line operations to a level they could support with available aircraft. According to the IMT, operational objectives took longer to achieve, but were accomplished safely.

Another IMT reported that they adopted a “think big” philosophy to help them determine the appropriate management response while managing a very large number of fires in a single complex. By employing this philosophy, the IMT targeted priority fires, managed some fires as “Fire Use,” and took action on lower priority fires as time and resources allowed.

One Type 2 IMT decided to simply monitor their fire by air for several days and help the host unit develop trigger points for suppression actions and evacuations. The terrain was very rough, rocky, and inaccessible. The IMT concluded, in consultation with the host unit, that their strategy would present less risk and cost. The incident caused them to rethink where teams put people and how much money they spend putting out some fires when, due to safety concerns or total costs, those fires may be better left in a monitoring status. According to this team, when considering Wildland Fire Situation Analysis (WFSA) alternatives, a monitoring strategy may prove less costly than spending millions of dollars and exposing fire personnel to unnecessary risk.

Yet another IMT found themselves in a situation not uncommon in 2003. The team was assigned to manage a complex of eight fires, totaling 30,000 acres, with some fires branched. Faced with shortages of helicopters, helicopter management personnel, and line overhead, the IMT felt that they were stretched beyond their capabilities. According to this team, the IMT members grew professionally from the experience, but that expectations and needs were beyond their organizational ability.

### **Lessons Learned:**

- ☀ When dealing with a very large number of fires in a single complex, look at the “big picture” and gain situation awareness of the entire incident. Set priorities and consider the full range of options available when establishing the appropriate management response to individual fires. Prioritize fires based on resource availability, scaling back line operations based on the available resources needed to safely succeed.
- ☀ Type 2 IMTs are not intended to manage branched fires and large complexes. The expectations and needs of these incidents exceed the organizational ability of most Type 2 IMTs.
- ☀ When safety concerns or costs dictate, consider leaving fires in a monitoring status, rather than taking expensive suppression action or compromising safety.

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### **Australian Approach to Human Resources**

**Background:** In Australia, Human Resource Specialists are not used on fire assignments. According to the U.S. personnel who went to Australia in 2003, there was no talk about recognizing or highlighting the importance of people's differences and it was not addressed in the IAP or briefing.

**Lesson Learned:** American firefighters can learn from foreign assignments, particularly by being exposed to different ways of doing business. We may want to examine the Australian approach to the fire camp human resources function.

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### **Too Few Resources Assigned to the Human Resources Specialist**

**Background:** One IMT reported that they had too few dedicated human resource assets and that their Human Resource Specialist was unable to manage the incident’s human resources workload. The IMT addressed the challenge by having IMT members educate personnel during briefings, providing messages in the IAP, conducting educational sessions, modeling appropriate behavior, and resolving issues at the lowest level between affected personnel.

**Lesson Learned:** IMT members can supplement the Human Resources Specialist when human resource assets are inadequate.

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## **Incident Command Lessons from Australian Assignments**

**Background:** Many lessons were learned about how fires are managed and suppressed in Australia, particularly regarding approaches to incident command.

### Having a Deputy IC from the Domestic Agency was Essential

According to U.S. personnel who went to Australia in 2003, having a Country Fire Authority (CFA) Deputy IC (DPIC) assigned to fires managed by U.S. personnel proved essential. The CFA DPIC was able to coordinate movements of CFA equipment and personnel to meet operational needs. The IMT maintained continuity and consistency by maintaining the same CFA DPICs in the rotation.

### Taking Advantage of Local Knowledge and Coordinating Day and Night Command

Local ICs were very knowledgeable of the factors that influenced fire behavior, the terrain, transportation systems and other elements that determine effective tactics and strategy.

The Australians managed their fires with a Day IC and a Night IC that worked together as part of one, seamless IMT. The day shift would concentrate on resource ordering and deployment orders, and the night shift would take the responsibility for strategic planning, mapping and tracking of resources and logistical support.

In some circumstances, this was not the case, and there were two independent IMTs, one for night shift and a different one for day shift. According to the respondents, having two independent IMTs was not efficient. Inconsistencies between night shift and day shift ICs generated confusion and reduced production because each could and would change the other's plans and resource assignments. At times, each IMT was working from different incident objectives because ICs failed to coordinate and agree on them.

### IC Role

U.S. personnel reported that ICs got bogged down in the day-to-day operations rather than keeping the big picture viewpoint and managing the overall team. The respondents observed that the ICs were consulted on every issue, big or small, and this had the potential to discourage initiative and development of leadership skills within the IMT.

### Taking Advantage of Foreign Expertise When Assigned

During the first deployment to Australia, there seemed to be no clear idea of what to do with the U.S. personnel or what expectations were for them. At times, the U.S. personnel felt that they were working well below their capabilities. However,

the second deployment was much different, as there was greater acceptance and confidence in the abilities of the U.S. personnel. The Australians allowed U.S. personnel to fully serve in the capacity of an IC, and experience the full range of tasks of the Australian IC. This deployment was an excellent example of the ongoing exchange program (Australia/New Zealand/USA) and should be considered for continuation during less severe fire seasons as well.

### IC Conference Calls

The IC conference call with the IMACC was informative and helpful. On the other hand, not having scheduled calls with the IMT on adjacent fires caused some confusion.

### Effective Initial Briefing and Delegation of Authority

The IC's first orientation and initial briefing at Dargo was incomplete and lacked a format. This incomplete briefing coupled with the absence of a formal letter of delegation, left the U.S. ICs with differing perspectives, information and expectations.

### Incident Management Teams (IMTs)

Some Australian IMTs arrived with up to 27 personnel, but many of the positions were management assistants or other minimally qualified personnel. In practice, a U.S. IMT is smaller than the actual staffing provided by the two Australian IMTs used to staff a 24-hour period. For example, one 23-27 person Australian IMT for Day shift, plus another 23-27 Australian IMT for Night shift equals 46-54 people. In the US, IMTs are running 36-44 people to cover both day and night operational periods, including a Finance Section, an Air Operations Branch and other key positions.

### **Lessons Learned:**

- ☼ When working in a foreign country as IC, having a domestic Deputy IC may prove essential. This lesson likely extends to non-foreign assignments where the host agency may have little experience with Incident Management Teams or the Incident Commander's agency, on interagency incidents, when using unified command, and on non-wildland fire assignments.
- ☼ Take advantage of local talent when establishing ad hoc teams. This lesson pertains especially to Type 3 Incident Management Teams and teams assembled during severe fire seasons.
- ☼ When operating using separate organizations for different operational periods (or in different locations,) the end result should be seamless integration between operational periods, locations, and between teams.

- ☀ Scheduled Incident Commander conference calls with coordinating authorities are a good idea. Also consider scheduled conference calls between adjacent IMTs in multiple fire situations.
- ☀ Take full advantage of foreign expertise when assigned through exchange, study or support arrangements. Trust that assigned personnel have something to offer, accept them into your organization, show confidence in them and employ them to the fullness of their abilities.
- ☀ Initial orientation and briefing of the IC is essential to success, as is a formal delegation of authority. These tools unify perspectives, information and expectations.

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## **LESSONS LEARNED RELATED TO THE FINANCE FUNCTION**

### **Use of Incident Business Assistant (IBA)**

**Background:** On one incident, an area command team (ACT) filled the position of Incident Business Assistant (IBA). However, some problems occurred between the IBA and other team members. The Incident Management Team (IMT) was able to overcome this challenge by addressing information flow with the IBA and focusing on closing the communications loop with all players.

#### **Lessons Learned:**

- ☀ By filling the IBA position an ACT can improve the quality, oversight, and closure of the finance job.
- ☀ Regardless of whom the IBA works for, when an Area Command is in place, the IBA needs to coordinate very closely with the Area Command team and should be considered as a member of the area command team.
- ☀ When an IBA works with an IMT, introduce them to the IMT members, their functions and their relationship to the IBA duties. Treat the IBA as a part of the team and integrate their responsibilities with those of other IMT members.

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### **The Finance Function on a Non-Wildland Fire Incident: Space Shuttle Columbia Recovery Effort**

**Background:** The recovery effort brought together a mix of agencies that normally do not work together. Working under the Incident Command System and unified command, various local, state and federal agencies including the National Aeronautic and Space Administration (NASA), the environmental Protection Agency (EPA), the USDA Forest Service, the Texas Forest Service (TFS) and the Federal Emergency Management Agency (FEMA) were able to respond to the concerns and uncertainties of coming to an assignment such as

the space shuttle recovery. According to respondents, it worked well that each agency applied its own fiscal rules for its portion of the recovery effort. Buying Teams and IBAs were assigned to this complex incident, a practice that, according to respondents, was very successful.

However, other respondents report that the Procurement Unit Leader performed services that are usually assigned to the Buying Team. Consequently, many of the Procurement Unit Leader's responsibilities fell to the Finance Section Chief. According to respondents, for assignments such as this one, an additional procurement person should be assigned to the Procurement Unit, with responsibility for paying vendors, making emergency purchases, and assisting with auditing and posting equipment time during slower periods of the assignment.

**Lessons Learned:**

- ☀ Assign Buying Teams and IBAs to complex incidents when an IMT is responsible for a majority of the management of a non-wildland fire incident.
  
- ☀ When working on multi-agency incidents, consider having each agency apply its own fiscal rules for its portion of the mission, rather than attempting to unify fiscal rules.
  
- ☀ When the needs of the incident require that the Procurement Unit function as a Buying Team, order additional personnel for the Procurement Unit.

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**Effective Approach to Cost Containment**

**Background:** An IMT considered its ability to overcome a confrontational approach to cost containment and evolve to a partnership with the host agency to be one of its successes. The IMT reports that it initially met with cost containment measures, implemented by the host unit, which the IMT viewed as micro-management. In addition, early in the incident, these cost containment measures had the unintentional consequence of increasing some costs.

The IMT requested and received a review team from the Regional Office to evaluate the situation. This action proved invaluable, and helped the relationship between the IMT and the host unit to evolve into a partnership. The host unit recognized the need to provide a work environment that allows the IMT to incur costs that allow them to improve working conditions and manage cumulative fatigue in the Finance and Planning Sections. This ability to improve the work environment and mitigate team fatigue is critical for the success of an IMT over the course of a long fire season. An IMT cannot expect its people to work in what is essentially an office environment where temperatures exceed 100 degrees and still expect high performance and a quality product.

**Lessons Learned:**

- ☀ Cost containment begins and ends with the IMT, with support from the host unit. A partnership between the IMT and the host agency provides the most effective approach to cost containment. A micro-managing approach to cost containment by the host agency creates a confrontational relationship and can cause unintentional consequences for members of the IMT and may even actually increase costs.
  
  - ☀ When the IMT and host agency have different approaches to cost containment, requesting and receiving a review team from the host unit's supervisory office can facilitate background and resolve the issues.
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**National Contracts for Crews and Engines**

**Background:** IMTs reported that, while national contracts for crews and engines provided better resources than have been seen in the past, extensive use of contract resources created an unusual burden on their teams' finance sections.

One IMT pointed out that a good Contracting Officer's Representative (COR) can make a substantial difference, because they can effectively assure that resources fulfill their contract obligations. According to this team, a COR is needed for each IMT or, at the very least, at each Area Command. Respondents reported that there were many problems with crews from the Pacific Northwest, particularly the English-speaking requirement. One IMT handled these issues before the crews checked in to the incident, and they believe that this proactive approach saved the IMT countless problems.

An IMT assigned to the recovery effort reported a similar experience with contract resources. The host agencies assigned one COR and one Interagency Contracting Officer Representative (IACR) to the entire incident, which required the COR and IACR to represent crews assigned to all four branches of the incident, plus the staging area.

This IMT also reports that the heavy use of contract crews resulted in numerous potentially serious language barrier incidents in the medical unit. Additionally, with as many as 49 contract crews under one warehouse roof, there were several violent conflicts between crewmembers during periods when the COR and IACR were not available. The IMT's Human Resource Specialist was required to resolve these issues in the absence of the COR and IACR.

In addition, the IMT found that CORs responsible for contract crews need to be very familiar with the contracts. In one instance, when the IMT first arrived, the COR on-site gave erroneous contract interpretations in answer to contract questions.

Finally, with the heavy use of contract crews, the IMT increased the cost of their branch by as much as \$100,000 per day (25%) in part because contract provisions were not enforced. The agencies paid (through contract provisions) the contractors to provide PPE, boots, transportation, and other minor services, and then provided those same items to contractor personnel at government expense when needed.

**Lessons Learned:**

- ☼ Extensive use of contracted resources continues to place strain on IMTs, particularly the finance section.
- ☼ A good Contracting Officer's Representative (COR) is essential for managing large numbers of contract resources to ensure that resources fulfill their contract obligations. A COR may serve each IMT or, at the very least, a COR should work at each Area Command.
- ☼ CORs that are responsible for contract crews need to be fully familiar with the contracts.
- ☼ Contracts may need to include an alternate pay schedule when circumstances require the government to provide goods and services such as personal protective gear, clothing, laundry and transportation.
- ☼ Protocols need to be developed to ensure contract crew CORs are available on the incident 24 hours per day once the crew numbers exceed some threshold (perhaps 10 - 15 crews.) Having the COR staying in a motel does not work because the problems tend to erupt at night.

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**Emergency Equipment Agreements**

**Background:** One IMT reports that the team met with better success at signing up equipment quickly and efficiently when compared to other fires in the same area because they went through the cooperating state agency. Some Federal agency requirements significantly add to delays in getting equipment signed up and operating, even in emergency situations.

**Lesson Learned:** IMTs may be able to sign up equipment quickly and efficiently by working with a cooperating state agency.

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**Location of Buying Team and the Incident Supply/Ordering Units**

**Background:** One IMT reported that having the Buying Team and the Incident Supply/Ordering units located in the same office increased ordering and procurement efficiency because IMT and expanded dispatch personnel were able to work together, communicate efficiently and without delay, answer questions, and resolve ordering and purchasing issues immediately.

**Lesson Learned:** When Buying Teams are assigned, consider co-locating them with the incident Supply/Ordering Units at the incident to improve their efficiency, effectiveness and cooperation.

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### **Payment Processes for Services Provided Under MOU**

**Background:** One IMT reported that they were challenged by an inability to pay for services performed by other government agencies under a memorandum of understanding (MOU.) For example, the IMT provided emergency road signing through an existing regional MOU with the state Department of Transportation, but no payment process was in place to pay for the service. The team overcame this challenge by having their Procurement Unit Leader put together a service agreement providing the basis for payment.

**Lesson Learned:** Service agreements or other payment processes are needed to pay for services that other government agencies provide under memoranda of understanding. In the future the agencies need to systematically provide IMTs with appropriate templates. However, for now, IMTs need to be prepared to create these payment mechanisms on their incident.

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### **Vehicle Insurance Coverage For Government Employees Driving Outside the Country**

**Background:** Forest Service employees who entered Canada driving a Forest Service vehicle were not covered by the Tort system in case of an accident. Therefore, private insurance coverage was purchased and checked out to individuals/vehicles as needed. Washington State employees were already covered by their agency.

**Lesson Learned:** Agency employees may not be legally covered by their agency when driving an agency vehicle outside the country. Private, supplemental insurance is available and can fill the gap.

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## **LESSONS LEARNED RELATED TO THE INFORMATION FUNCTION**

### **Information On an All Risk Incident**

**Background:** The Space Shuttle recovery effort brought together a mix of agencies that normally do not work together. Working under the Incident Command System (ICS) and unified command, various local, state and federal agencies including the National Aeronautical and Space Administration (NASA), the Environmental Protection Agency (EPA), the USDA Forest Service, the Texas Forest Service (TFS) and the Federal Emergency Management Agency (FEMA) were able to effectively manage the information function. Respondents reported that they learned from the following successes and challenges several key areas.

One IMT identified the need to relocate certain functions within the camp to better serve the mission, including locating the information function at the front of the camp to allow easy access to the public. This team also reported other notable experiences in the Information function.

Several community meetings were conducted prior to the arrival of the IMT, with the intent of updating residents and local media on incident strategies. In addition, community volunteers were very involved in all aspects of the recovery effort during the early stages, but were displaced when the IMTs were activated. When the IMT arrived, at the request of NASA, they scheduled town meetings in two communities with the objectives of providing an update, beginning to move toward “closure,” showing appreciation for the communities, and re-engaging them. The town meetings employed an MS PowerPoint presentation that was intended to show appreciation for the efforts of the local residents during the initial stages of the incident, and linked their efforts to both the crews currently searching the area and the IMTs. The presentation began with a memorial to the astronauts, followed by scenes featuring local residents and firefighters involved in the search effort. The presentation concluded with slides supplied and narrated by NASA, identifying specific shuttle materials and a presentation describing the role of the EPA in the search. The town meetings also included addresses by community leaders and incident management personnel. The town meeting results were very positive and no additional meetings were necessary.

A Joint Information Center (JIC) retained responsibility for media relations and specific information pertaining to shuttle material, personal effects and human remains. One IMT reported that since there was little media interest during their time on the incident, and team personnel were able to focus on other functions including posting information authorized by the JIC at public locations, postings within camp, camp tours, VIP visits, motivational presentations and community meetings.

**Lessons Learned:**

- ☀ Locate the Information function within the ICP/camp in such a way (front of the camp) to allow easy access by the public and the media.
- ☀ Community meetings can provide an effective vehicle to show appreciation for the efforts of local residents during initial stages of an incident and to link their efforts to the agency incident resources IMTs.
- ☀ Presentations using MS PowerPoint and other presentation software provide an effective tool for organizing community meetings.
- ☀ Joint Information Centers (JIC) can provide service to multiple incidents that free IMT Information staff from routine media relations functions, allowing team personnel to focus on other functions including providing information to incident personnel, providing camp tours for the media, very important persons (VIPs,) and the community, developing presentations, and planning community meetings.

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**Informational Meetings for the Community**

**Background:** IMTs reported their successes at providing informational meetings to local communities. For example, at their in-briefing, an IMT was assigned to conduct information meetings in two communities on the following two nights. Both information meetings were very successful in sharing critical information about evacuation planning, fire behavior and suppression activities.

Approximately 300 people attended in one community and 200 people came in the other. The IMT used local phone trees, handbills, notices posted at community gathering spots, and news releases to spread the word about the information meetings. A standard agenda template was used with standard attachments including the latest news release, the Incident Status Summary (ICS 209) and an incident map. Also included were Evacuation Planning documents including a narrative description of the stages of Evacuation Planning and a map showing the management action lines associated with the different stages of evacuation. A toll free number for regional information and a website address were also included.

Another IMT held a public information meeting the evening of their first operational period. The IMT maintains a policy of conducting this first night meeting whenever public interest is adequate. In this case, the meeting was very successful because it resulted in the efficient sharing of information, especially regarding evacuation planning. A follow-up public meeting was held later in the week to update residents on fire activity and current plans. Fire camp tours were held on two days to allow local residents an inside look at the activities in camp, and these were well received.

**Lessons Learned:**

- ☀ Community information meetings can provide an effective vehicle for disseminating critical information about evacuation planning, fire behavior and suppression activities. Use local phone trees, handbills, notices posted at community gathering spots, and news releases to spread the word about information meetings.
  
- ☀ Develop and maintain a standard community information meeting agenda template and standard attachment templates. Be prepared to include regional or other information, toll free numbers and websites.
  
- ☀ Fire camp tours that give local residents, VIPs and the media an inside look at the activities in camp and can provide an effective public relations tool.

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**Use of a Local Fuels/Prevention Trailer**

**Background:** The hosting unit provided an interagency fuels reduction/prevention trailer that was fully staffed and stocked with assorted prevention materials. This trailer was assigned to a local community near a major highway, and was able to provide information on the fire, defensible space and other prevention messages to over 250 people in the first four days of the fire.

**Lesson Learned:** IMT information staffs can use local fire prevention/outreach resources to supplement the team’s public information efforts. Check with the host unit to see what is available.

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**Joint Information Functions and Other Assistance**

**Background:** Several teams reported on their experiences with joint information centers (JIC). JICs are designed to provide IMTs with all their media and public phone call service on an interagency basis. Most, but not all IMTs found that JICs provided a significant advantage to their information staff, and reported on a variety of working relationships.

At one incident, daily fact sheets and other fire information routinely moved back and forth between the emergency mobile communications center, located at the ICP, and the JIC located in a nearby community. This system was in place when the team arrived, and they found that it served as an excellent aid to information distribution.

Another IMT reported that proactive cooperation from the local interagency dispatch center provided a coordinated, multi-agency information distribution point and a place to field media calls. At this incident, representatives of the State Fire Marshall’s Office, state forestry organization and other agencies were successfully integrated into the information management effort.

Not all IMTs had completely positive experiences with joint information functions. One team, assigned to the recovery effort, reports that information management presented a unique challenge in that all information dissemination was controlled through a JIC that initially proved very reluctant to provide even the most basic information to the media. In this case, the Incident Commander (IC) and the Information Officer worked with the JIC to sponsor a “media day,” and the JIC provided a Space Flight Awareness team for the IMT to work with, allowing greater freedom for information dissemination.

**Lessons Learned:**

- ☀ Joint Information Centers (JIC), set up in nearby communities, can provide very effective service to Incident Management Teams (IMT), including media and public phone call service, providing significant advantages for the IMT information staff. On multi-agency incidents, integrate representatives of the cooperating agencies into a joint information management effort.
  
- ☀ In the absence of a Joint Information Center (JIC), interagency dispatch centers may be able to provide many of the same services normally associated with the JIC, such as providing a point of contact for media and public phone calls.

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**Large Distances Covered by IMT Information Staff**

**Background:** An IMT reported that the territory covered by their information staff included 313 highway miles in two states. In addition, the Information staff of the IMT served a coordinating role much like an Area Command. This IMT overcame the geographic and management challenges by developing a suitable organization, producing operating protocols, and achieving excellent cooperation across the involved agency units and zones. Other teams reported similar experiences and similar approaches to overcoming the associated challenges.

**Lesson Learned:** When the information function of an IMT is covering an unusually large area or faces travel or geographic challenges, they need to develop an organization to handle the job, order resources to staff the organization, adapt operating protocols, and develop effective working relationships with host agencies and their cooperators.

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### **Cooperation Between Information Staffs**

**Background:** One IMT reported that establishing an effective, cooperative relationship between their information staff and the host agency's information staff presented a challenge. According to the IMT, the host unit wanted complete control of media releases, though no single, specific person was designated to receive the releases. Members of this IMT report that they could have made the host unit look good if they had been able to reach-out to the host and operate with less constraint.

**Lesson Learned:** Effective, cooperative relationships between the information function of the IMT and the information function of the host agency are key to a successful, coordinated information management function.

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## **LESSONS LEARNED RELATED TO THE LIAISON FUNCTION**

### **Area Command Liaison with Agency Representatives**

**Background:** On one fire, three agency representatives were assigned, including representatives of local and state government agencies who were not the delegating authorities. However, the Area Command Team (ACT) did not include an assigned Liaison Officer. The team recognized the critical need to establish a position to provide a day-to-day interface with the agency representatives, and to staff that position with a person who understood the cultures of the agencies the team was dealing with (city, county and state agencies other than the natural resource agency with jurisdiction).

**Lesson Learned:** With the complexity of incidents increasing, area command teams should formalize the Liaison Officer role for the future. The Liaison Officer is a standard component of the ICS as part of the Command Staff and that should be reflected in area command teams.

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### **The Importance of the Liaison Officer**

**Background:** Several Incident Management Teams (IMTs) reported the actions of their Liaison Officers as notable successes during 2003. Generally speaking, IMTs found that their use of a Liaison Officer greatly increased the team's ability to coordinate with other agencies, organizations and private citizens; and provided improved cooperation, enhanced credibility and reduced time demands on other members of the Command and General Staff.

One IMT found that having a Liaison Officer that understood the intricacies of working with county and state officials proved invaluable. On their incident, cooperation between the IMT and the local agencies needed improvement when the IMT arrived, because there were hard feelings from experiences on previous incidents and with previous teams. The IMT found that dealing with difficult personalities, and issues that existed before they arrived, detracted from their ability to do what was in the best interest of the public. Some local emergency managers, unfortunately, let their ego get in the way of doing the right thing. The IMT included two non-federal Liaison Officers, who, according to the IMT, did an excellent job of keeping lines of communication open between all cooperators. Another IMT benefited when the County provided a person funded by the National Fire Plan to help as a local liaison with landowners.

**Lessons Learned:**

- ☼ An effective Liaison Officer will have a good understanding of the function and perspective of State and local government agencies.
  
  - ☼ An effective Liaison Officer increases the Team's ability to facilitate cooperation and coordinate with other agencies, organizations and private citizens. An capable Liaison Officer reduces demands on other members of the Command and General Staff.
  
  - ☼ Consider using personnel from non-traditional sources (county government, volunteer fire departments, Administratively Determined (AD) employees to staff liaison functions with people having local knowledge, contacts and rapport.
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## **LESSONS LEARNED RELATED TO THE LOGISITICS FUNCTION**

### **Locating Mobilization Centers and Staging Areas**

**Background:** Two incident management teams (IMTs) managing non-wildland fire incidents cited the location of their mobilization centers or staging areas as notable successes.

In regard to the Hurricane Isabel assignment, the respondents reported outstanding facilities and support at Fort Eustis, including:

- A hangar that provided ample space for storing the contents trucks that had to be off-loaded.
- Parking space available for two hundred trucks.
- Additional support provided by the base in the form of forklifts, operators, and access to base facilities such as the Post Exchange and the laundry.
- A military liaison assigned to the Mobilization Center Management Team (MCMT), an arrangement that was very effective.

Another IMT working on the Space Shuttle Columbia Recovery Effort reported that the selection of Longview, Texas for a Staging/Mobilization/Demobilization Center was outstanding. In retrospect, the location had the following key characteristics that made it an excellent choice to service the four camp locations:

- **Local Airport Capacity:** The long runway at Longview accommodates large charter jets (727, 737, 757) to efficiently transport multiple 20-person crews cross-country. Operations were greatly facilitated by the combination of runway length and the absence of the traffic and congestion that accompanies commercial air carriers at larger, commercial airports.
- **Proximity to Dallas/Fort Worth and Shreveport:** The relatively easy access to both the large commercial airport at Dallas/Fort Worth, and the regional airport at Shreveport via Interstate 20 greatly facilitated movement of overhead and those crews that flew commercial.
- **Facilities:** Longview has a significant number of vacant factories and manufacturing facilities. Three of these were under agreement for use by the incident: one as the ICP/crew housing (Coke Plant), one as crew housing/bus/van parking (Dresser), and one as rental vehicle return (Trinity). The availability of these facilities greatly facilitated housing large numbers of crews in warm dry conditions. "All Risk" means "all weather," and keeping crews warm and dry is paramount.

- Access to Entertainment and Comfort Items: The tighter the crews are packed into a building, the more restless they become. Having eating establishments and convenience stores within easy walking distance greatly added to the comfort of the crews and kept them from looking for other forms of entertainment while in staging. Cards, movies (large screen TV or projector and DVD player) and horseshoes occupied the greatest number of the crewmembers.
- Central Location: Longview was within reasonable driving distance of all four camps and the Federal Emergency Management Agency Disaster Field Office (DFO) in Lufkin.

**Lesson Learned:** Mobilization Center/Staging Area location contributes to mission success. Look for characteristics including:

- Central location within reasonable driving distance of all incident locations being supported and the ICP.
- Adequate storage space for supplies and equipment needed to accomplish the mission.
- Ample parking space for all vehicles required by the incident operations.
- Additional support provided by the military or other cooperators including shipping, receiving and material handling; and access to facilities such as shopping and laundry.
- Adequate airport capacity to allow efficient mobilization and demobilization of incident personnel by charter aircraft.
- Proximity to major airport facilities to enable movement of overhead and crews flying commercial.
- Facilities that allow for housing incident personnel when assignment duration or environmental conditions demand.
- Access to entertainment and comfort items for incident personnel assigned to long-term incidents to discourage incident personnel from looking for other forms of entertainment while in staging.
- When working on a military post (or facility operated by an agency), a military liaison (or liaison from the organization managing the facility) should be assigned to the Mobilization Center Management Team (MCMT,) an arrangement that proved very effective at Fort Eustis.

## **Preventing the Spread of Illness on a Long-Term Incident**

**Background:** Early in the incident, the IMT at a mobilization/demobilization center began housing incoming (mobilizing) and outgoing (demobilizing) crews in separate facilities. The demobilizing crews were housed at one facility; and the mobilizing crews were housed at separate facilities during the incident. Shower facilities were provided at each location. The only time the crews intermingled was at mealtime because the caterer was located at one facility. Separating the crews likely reduced the incidence of spreading coughs/colds and upper respiratory infections that the demobilizing crews had picked up in the two to three weeks they were on assignment.

After the crews departed from both the housing facilities of the mobilizing and demobilizing crews each day, camp crews moved the cots and mopped the floor with disinfectant in each crew area. Cots were sprayed with disinfectant, and all surfaces wiped with disinfectant. Warehouse doors were opened for ventilation, and fans were located to circulate air through the facility. Hand washing before entering the meal line was mandatory at the direction of the Incident Commander (IC).

The Medical Unit Leader and Medical Unit staff briefed the incoming crews on hygiene issues including the requirement that all incident personnel must wash their hands before meals by order of the IC. They also debriefed each crew to determine what medical issues the crew had, and followed up with those patients with medical conditions.

### **Lessons Learned:**

- ☀ Segregating mobilizing and demobilizing personnel and providing consistent, daily sanitation and custodial service in sleeping areas can provide an effective strategy for preventing the spread of illness in mobilization/demobilization facilities.
  - ☀ Hand washing and other hygiene factors decrease the spread of illness. Briefings by the Medical Unit provide information and rules to incident personnel. Crew debriefings enable the Medical Unit to follow-up on specific medical issues.
  - ☀ The IC can assist in preventing the spread of illness by imposing mandatory hygiene rules.
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### **Medical Unit Staffing with Physician and Nurses**

**Background:** On the recovery effort, one IMT staffed its Medical Unit with a contracted physician and contracted nursing staff. Medical Unit services, notifications, and field responses were managed professionally following established team procedures, and the services of a physician and nursing staff at the ICP provided timely treatment in a cost efficient manner.

**Lesson Learned:** On-site, contracted medical staffing, including physicians and nurses, can be effective and cost efficient.

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### **Incident Medical System Policy and Over-the-Counter Medications**

**Background:** The IMT on one incident described the incident medical support system as “broken.” Policy changes have handcuffed IMTs and the agencies have not “staffed-up” to address new policies. On this incident, the medical unit had significant problems securing adequate medical supplies, particularly cold/flu medications. The Medical unit had approximately 2400 visits for a variety of minor injuries or illness, 1550 of which were for cold/flu symptoms.

This IMT, like many others, recommends that the system use distributors or major chain stores that can process large orders of over-the-counter medications with 24-hour advance notice. With the number of large fires and the high percentage (65%) of visits being for flu/cold illness the demand is completely overwhelming the normal purchasing system. The respondents recommend that this change should be made as soon as possible.

**Lesson Learned:** Fire agencies should use distributors or major chain stores that can process large orders of over-the-counter medications with advance notice. The number of large fires and the high percentage of Medical Unit visits for flu/cold illness overwhelmed the normal purchasing system. This change should be made as soon as possible.

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### **Medical Unit: Firefighter Foot Care**

**Background:** An IMT reported that blisters and infected blisters, caused by poorly fitting boots, accounted for the highest number of cases in their Medical Unit. Some infected blisters were incurred during recent work capacity testing, and became infected because crews were assigned immediately afterward without their foot problems being attended to. Some of the problems resulted from poor blister care advice from Squad Bosses and Crew Bosses. The Medical Unit Leader scheduled three after-hours foot care clinics in an attempt to improve understanding of appropriate foot care.

**Lessons Learned:** Blisters and other foot care issues can account for the majority of Medical Unit visits. Many of these medical problems result from lack of information or understanding on foot care. Medical Unit Leaders must be prepared to educate firefighters about foot care, and off-shift foot care clinics and other creative approaches can help.

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### **Logistics On an All Risk Incident (Space Shuttle Recovery Effort)**

**Background:** The recovery effort provided opportunities to learn many lessons about managing logistics on long-term, all risk incidents. For example, one IMT found that they were able to resolve logistic issues and establish plans easily because of what they reported as the enormous cooperation demonstrated by the Texas Interagency Coordination Center (TICC), the Texas Forest Service (TFS), Federal Emergency Management Agency (FEMA,) Environmental Protection agency (EPA,) National Aviation and Space Administration (NASA) and the members of their IMT. Each modeled a spirit of working together to get the job done in the most efficient, effective manner. Daily conference calls and face-to-face meetings worked well. This IMT also reported that their Supply Unit had control of all resource order numbers, and thereby avoided common problems such as duplicate orders and requests.

Another IMT reported on the importance of “reasonably accurate” property accountability records (for items like radios, cellular telephones, computers, and global positioning systems receivers), when transferring command from one IMT to another.

Another IMT reported their success in managing approximately 640 rental vans and pickup trucks that had been procured through the Department of Transportation for use on the incident. The IMT established a very simple but efficient system for returning these vehicles. First, returned vehicles were checked against the rental package for “E” number, VIN Number, and license plate number. Following this check, incident personnel fueled the vehicles and parked them by vendor group. The parking area was fenced and provided 24-hour security patrols, and the keys were left in the unlocked vehicles. Department of Transportation (DOT) inspectors provided inspections, often with the claims adjuster from the vendor present, so the IMT ground support unit did not need to do any inspections. Once agreement was reached on claims pertaining to individual vehicles (including detailing charges), the vehicles were released back to the vendors. This process proved exceptionally efficient, allowing the incident to receive 200 vehicles in three days, with 150 of them returned to the vendors during the same time period.

However, the recovery effort was not without logistic challenges. IMTs assigned to the recovery effort reported that the national ordering process is not adequately staffed for all risk incidents, making it difficult to fill resource orders in a timely manner seven days a week and during normal “off” hours. One IMT

employed a workaround solution; finding out where orders were being delayed and calling personnel directly at home, but this solution proved less than satisfactory.

According to this IMT, the fire cache system is not adequately supplied to support all risk incidents, including inclement weather gear, medical supplies, winter sleeping bags, brush and snake chaps, etc. Some caches were unable to provide needed supplies due to inventory activities. The IMT worked with caches that were not inventorying, but found that they had to supplement their orders with purchases, both through the buying team and by purchasing locally.

The sensitive nature of salvaged shuttle material; maps and other items unique to NASA and the EPA required a fenced, secure, restricted area that some agencies and members of the IMT were not accustomed to. One IMT reports developing a list of personnel that were provided unrestricted access and requiring all other personnel to gain access through the personnel with unrestricted access.

Establishing and maintaining an ICP and base camp for 1500 personnel in a region that does not generally set up fire camps, compounded by winter conditions, presented unique and often serious challenges for one IMT. IMT members worked through most issues, and made-do when they had to. However, they struggled to meet basic health and sanitation needs, especially during an ice storm. A large number of personnel, including most of the IMT, fell ill to the “camp crud”. The number of ill people affected the functionality and productivity of the effort. Future assignments under similar conditions need to use different facilities, such as military facilities, colleges, etc. For incidents of this nature, it is important for the IMT to get out of the summer “fire camp” mindset and into an all weather/all risk assignment mindset.

#### **Lessons Learned:**

- ☀ A high level of cooperation between the IMT, host unit, and cooperating agencies facilitates the resolution of logistic issues and allows the organization to effectively plan. Needed is a spirit of working together to get the job done in the most efficient, effective manner. Daily conference calls and face-to-face meetings help.
- ☀ On multi-agency incidents, the Supply Unit should maintain control of all resource order numbers to prevent common problems such as duplicate ordering.
- ☀ Accurate property accountability records (for items like radios, cellular telephones, computers, and global positioning systems) are very important when transferring command from one IMT to another. Signed transfer of property accountability documentation is critical when IMT transition, especially on long duration incidents.

- ☀ When working with unfamiliar cooperating or host agencies, ask the agency to assign a logistics or property accountability person to the IMT to expedite equipment tracking.
- ☀ When assigned to demobilize a large number of rental vehicles, a simple and efficient system can be employed to manage the task. Incident personnel can check vehicles against the rental package for “E” number, VIN Number, and license plate number, fuel and park the vehicles by vendor group. DOT inspectors and the vendor’s claims adjuster next provide inspections. Once agreement is reached on claims and charges, vehicles may be released back to the vendors.

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### **Security Innovations**

**Background:** Some responding IMTs reported innovations in security. One IMT implemented a security/identification badge system to identify incident personnel. The badges can be used for public safety, homeland security, supply distribution, and food facilities. The IMT believes that as the use of ID badges by incident personnel increases, conflicts in camp will decrease, reducing the workload in the areas of human resources and law enforcement/security. The team also believes that the use of identification badges will contribute to cost containment efforts by improving equipment accountability on incidents.

Another IMT established an alternate organization for safety and security on their team. This IMT modified the standard ICS organization, placed security and all law enforcement functions under the Safety Officer, and added the position of Public Safety/Law Enforcement Liaison. This IMT feels that the change proved more effective than a single Security Manager during interactions with the military, search and rescue groups county sheriff’s offices and other entities external to the ICP.

One IMT reported that the security resources and safety officers necessary for their large complex of incidents were not available. The IMT solved the problem by using “Off Duty Officers” (ODO.) However, while providing a pool of skilled people, using ODOs comes at significant cost. ODOs cost this IMT \$55 per hour per officer for regular duty hours, and \$82.50 per hour per officer for overtime hours exceeding 40 hours per week; plus mileage for privately owned vehicles at .40/mile and lodging reimbursement for officers to stay in motels. The incident averaged eight officers per day over a 19-day period for a cost of \$109,698. However, according to this team, the unavailability of qualified agency personnel to provide incident security will continue to require the use of contractors and ODO that will have the effect of increasing incident costs.

**Lessons Learned:**

- ☀ Implementing a security/identity badge system can reduce conflicts in camp, reduce the workload in several functional areas and contribute to equipment accountability and therefore, cost containment.
  
- ☀ An alternate organization for safety and security that places security and all law enforcement functions under the Safety Officer, and adds the position of Public Safety/Law Enforcement Liaison may prove more effective and efficient than the standard ICS approach.
  
- ☀ A shortage of qualified agency personnel to provide incident security will continue, requiring the use of contractors and off-duty law enforcement officers, who represent good, available, but expensive resources. Off-duty officers could represent a significant incident cost, perhaps costing tens of thousands of dollars or more.

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**Base Camp Guidelines: Conduct and Behavior**

**Background:** An IMT reports that they developed a briefing paper with the Incident Commander's expectations and rules of the camp and distributed it to each crew boss. A 2200-0500 curfew was in place and enforced for late returning crewmembers, and the IMT placed overflow sleeping in a separate building, where cots and sleeping bags were provided so that late returning crewmembers were identified on their crew manifest and bedded down in the overflow sleeping area to avoid disturbing sleeping crews. A bar located 100 yards from camp presented a problem, and the IMT did have a total of four individuals arrested for public intoxication by the local police department after failing to comply with camp security.

**Lesson Learned:** A briefing paper that clearly communicates the Incident Commander's expectations and rules of the camp that is given to all incident personnel prevents many problems and enables the IMT to enforce its expectations and rules.

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**Fire Camps in Australia**

**Background:** Many lessons were learned about how fires are managed and suppressed in Australia, including several related to fire camps and logistics.

Minimally Staffed Camps that Support Operations Well

In Australia, fire camps were minimally staffed. The fire camps the American group worked from were small, with not more than 300 to 350 people in the camp. The camp was there to provide for the firefighters and not to support itself. Food was available 24 hours per day, which meant that firefighters never had to leave the line to meet meal deadlines, but could work their shift and be flexible. If

firefighters came in early, there was food, and if they had to stay late, there was food.

### Effective and Efficient Vehicle Maintenance and Support

Vehicle maintenance and support was unique and worked well. Operators parked their vehicles in a designated parking area after each shift. The mechanics were mobile, and came to each vehicle, fueled them, cleaned the air filters, and did the necessary services while the crews were off shift. Crews did not have to drive their vehicle to a mechanic when there was a repair problem. Incident managers assigned vehicles to the American crew, but vehicles were also passed around when necessary, such as when assigned crews were off on their two days rest, which meant fewer vehicles were needed and the fleet was better utilized.

### Preparation for Foreign Assignment

Overall, the in-country briefing and training the U.S. firefighters received before going on the line was outstanding. However, they also believe that, if the U.S. sends people to Australia again, that they should be ordered with radios and tools. According to the respondents, it appeared that if radios and tools came into the country with the firefighters, they made it through customs. However, if tools and supplies were ordered separately and shipped to Australia separately, they took an inordinate amount of time to get through. The respondents also recommend that an Australian be assigned to work with, and act as a liaison for, any U.S. crew that is dispatched.

### Alcohol in Australian Fire Camps

The availability of alcohol at Australian fire camps presented U.S. personnel with a challenging dilemma. The camps were at inns/pubs, and the pubs were open 24/7. The U.S. team started-off by following their normal policy of staying dry, but were perceived by the Australians to be snobs because of it. The after-shift drinking tended to be social and the time when information exchange and teamwork was being accomplished. The respondents report that they did not see any major drunkenness or any fighting as a result of the drinking, but do not recommend fire camp drinking in the U.S.

### **Lessons Learned:**

- ☼ The Australian approach to fire camps requires minimal staffing and supports fire operations well, allowing for operational flexibility.
  
- ☼ The Australian approach to vehicle maintenance, support and fleet management works well, minimizes impacts to crews and reduces the number of vehicles on the incident.

- ☀ If the U.S. sends people to Australia again, they should be ordered with radios and tools, be assigned an Australian firefighter to work with, and act as a liaison for, any US crew that is dispatched.
  - ☀ Alcohol in Australian fire camps will present a cultural and ethical dilemma for U.S. firefighters dispatched to support assignments in Australia.
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### **Managing Family Visitors to Base Camp**

**Background:** While managing a fire, an IMT found that, with four crews from local Native American tribes assigned to the incident, family visitors were frequent. Overall, the IMT viewed the family visitation in a positive light, finding that it gave family members a chance to see their firefighters on assignment, and that the firefighters could receive support (clean clothes from home and some necessary personal items such as tobacco products), which reduced the need for local purchases. The IMT developed the following suggestions for managing this opportunity in the future, and shared these suggestions with the Agency:

- Designate a parking/meeting place for visitors
- The designated parking/visiting area should be adjacent to the camp, but separate from the camp activities and hazards such as large engine and heavy equipment traffic and parking.
- Established hours for visitors such as 1900 to 2230.

#### **Lessons Learned:**

- ☀ Under certain circumstances, family visitors to camp can and should be viewed as a positive. If acceptable, family visitation needs to be managed by the IMT.
  - ☀ Manage family visitation to camp by establishing an area for parking and visitation adjacent to, but outside camp and establishing visiting hours. Designate a parking/meeting place for visitors. The designated parking/visiting area should be adjacent to the camp but separate from the camp activities and hazards such as large engine and heavy equipment traffic and parking.
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### **Locating and Setting Up Base Camp and Incident Command Post (ICP)**

**Background:** One IMT found that the host unit and the incoming IC and Logistics Section Chief must coordinate closely when deciding the location of the base camp and the Incident Command Post (ICP). Decisions on locations of those facilities should not be made until this coordination takes place. It is important for the IMT logistics/facilities personnel to talk to the hosting unit as

soon as possible to articulate team needs, because hosting units do not always understand infrastructure needs that may preclude potential ICP locations.

Another IMT reported on their effort to move their entire camp to a location closer to firefighters that had previously been in spike camps. The IMT moved their entire camp and set it back up to operational status in six hours. The team attributed their success to the fact that their team uses trailers that include electrical hookups. These trailers are very mobile, efficient, and rent-free (refurbished FEMA trailers provided at no cost.) This IMT also suggests pre-season trailer contracts to get what teams need, cut-down on mobilization time, aid in cost containment, and provide a better environment for computers and people.

**Lessons Learned:**

- ☀ Location of the base camp and the ICP must be closely coordinated between the host unit and the incoming IC and Logistics Section Chief. Decisions about camp and ICP location should not be made without this coordination.
  
- ☀ Trailers (vs. tents or other structures) allow for camps to be relocated quickly if necessary, particularly if they include electrical hook-ups. No cost work trailers are available through FEMA. Pre-season contracts for trailers may also provide an effective source.
  
- ☀ One IMT reports the importance of providing written documentation on how to set up their camp and the proximity of various functions to one another. This enables the Facilities Unit Leader to hand off a sketch and get things organized much more quickly.

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**Options for Managing Base Camps**

**Background:** The Finance Section Chief on one IMT calculated the cost of maintaining base camp with contractors vs. staying in motels in town for the last few days of the incident. This effort by the Finance Section Chief saved the host units quite a bit of money, even though there was initial concern over having fire crews stay in motels.

**Lesson Learned:** A financial analysis should be prepared and considered when an incident is winding down and the IMT is considering its options for maintaining a camp vs. basing out of motels.

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**Supporting Spike Camps**

**Background:** One IMT, points out that the management of many large incidents includes the use of remote base camps and spike camps, and that proper briefing of personnel at these sites becomes a regular challenge. This

IMT dealt with the challenge by adding qualified personnel on the incident to facilitate and provide the information needed at remote briefings.

Another IMT expressed a deeper concern, pointing out that being able to support firefighters in far away locations with hot food that wasn't spoiled presented a challenge. The IMT overcame this challenge by discussing the issue as a team, and communicating and working with the catering contractor.

Another team reported that their incident was a test of air operations. With as many as six spike camps in operation at one time, it was difficult to get the right resupply orders to the right place at the right time.

**Lessons Learned:**

- ☀ When using spike camps, order additional, qualified operations and planning personnel to the incident to ensure that incident personnel at remote camps are receiving quality briefings and the information they need.
- ☀ The IMT must be prepared to open lines of communication and work with catering contractors to assure that incident personnel in spike camps are receiving food in adequate amounts and of adequate quality.
- ☀ When operating spike camps supported by helicopter, assign a Receiving and Distribution Manager to the helibase, for the sole purpose of coordinating orders being moved to spike camps as cargo.

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**Incident Replacement Policy**

**Background:** Apparently some of the Interagency Hotshot Crews (IHC) and contractors need to better understand the incident replacement policy. One team reported problems with IHC regarding legitimate replacement of equipment at the incident. Another IMT reported that contractors were inspected using the general inspection form instead of the specialized inspection forms required under their contract. This caused problems on demobilization when contractors wanted to replace equipment that was left on the line. Contractors wanted to replace second grade hose with top of the line hose.

**Lessons Learned:**

- ☀ Issue written direction on the incident replacement policy to crews upon checking in, reminding them of national and regional direction on incident replacement.
  - ☀ Use the engine/tender contract inspection form when inspecting contract engines, rather than the general inspection form.
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### **Drinking Water: Replacing Cubitainers**

**Background:** One IMT recommend that instead of ordering, building and filling “cubitainers” to be sent to the line, that the agencies buy drinking water. This IMT made contacts with distributors. For example, 2 ½ gallon jugs of water, 3 per case, are available from the Pepsi Distributor at a cost of approximately \$6.25 per case or \$0.83 per gallon. A new “cubie,” prior to being built, costs approximately \$4.80. Add the cost of strapping tape and labor costs to build the box, and fill the cubie, and the estimated cost per cubie is \$8.00 or \$1.60/gallon. Reducing the risk of contamination represents an additional benefit to buying pre-packaged water.

**Lesson Learned:** Bulk purchasing of pre-packaged drinking water appears to be more cost effective than using cubitainers, and can reduce the risk of drinking water contamination.

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### **Cooling Systems for Regional Cache Yurts**

**Background:** Yurts are a regional cache item, and are readily available to incidents for use as incident office facilities. However, IMTs report that, during hot weather over 90 degrees, cooling the interior of a yurt to a workable temperature is costly and difficult. After several days, one IMT replaced undersized evaporative coolers with small air conditioning units. However, air conditioners were not installed in all work tents as a cost containment measure. The IMT points out that cost containment is the responsibility of the team as well as the host unit, and that, in this case, the decision was not a cost effective one. According to this team, cooling systems need to be included as a cache item, or the agencies need to replace cache yurts with contracted tents that include cooling units.

**Lesson Learned:** During hot weather (over 90 degrees,) cooling the interior of a yurt to a workable temperature is costly and difficult. Cooling systems need to be included as a cache item, or the agencies need to replace cache yurts with contracted tents that include cooling units.

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### **Donating Surplus Food**

**Background:** Two IMTs reported that they were confronted with the challenge of finding an outlet for donating surplus food in the local community.

**Lesson Learned:** The local food bank is a viable option for donating surplus food.

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## **LESSONS LEARNED RELATED TO THE OPERATIONS FUNCTION**

### **Operations On an All Risk Incident**

**Background:** The Space Shuttle Columbia Recovery Effort brought together a mix of agencies that normally do not work together. Non-traditional agencies working together for a common mission successfully integrated, and the effort was a success both in the field and in camp. Using the versatility of the available teams assured success in this “all-risk” (non-wildfire) assignment. Providing crews and overhead with an orientation proved valuable. Orienting each new crewmember to the incident ensured clearly defined expectations, roles, and direction for the incident.

Some respondents report that to be consistent with the ICS, Divisions should have been identified as Groups, because they were functional units not assigned to a single geographic area. Others pointed out that, since search and rescue comprised the primary effort in the field, assigning one search and rescue instructor/expert to every search division would have enhanced crew effectiveness.

#### **Lessons Learned:**

- ☼ On unusual incidents, orient each and every crewmember to the incident to clearly define expectations, roles and rules.
- ☼ Use ICS principles appropriately on non-wildland fire incidents, including the designation and assignment of groups and divisions.
- ☼ When incident operations include non-wildland fire strategy and tactics, assign tactical instructors and experts to the division or group to enhance effectiveness.

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### **Diversity of Tactics**

**Background:** Several incident management teams (IMTs) reported using a diversity of tactics, including some unconventional ones, to accomplish their assignments.

Several IMTs reported that the need to use a range of tactics presented them with their greatest challenge. For example, one IMT reported that, while managing a large complex with a number of fires, they used of a variety of suppression tactics on many different fires at once; including burnout with and without aerial ignition, minimum impact suppression tactics (MIST), cold trailing, hot-spotting, direct line construction, indirect line construction, wet mop-up, application of retardant, spike camps, and coyote tactics. Another IMT had a fire in extremely rough and steep terrain. Their fire did not completely consume

available fuels within the fire perimeter, and numerous hazards were present including, snags, downfall, tall brush, and no road access. Crews stayed in a spike camp located near the incident, and by using the right mix of aircraft, saw teams, and an elaborate hoselay; they contained the fire without constructing fireline and without receiving a break in the weather or fire behavior. Yet another IMT found that the use of locally contracted excavators to construct direct line in certain areas was very cost effective, safe, efficient, and allowed for expedient mop up.

As resource shortages impacted operations, priority setting became important during the 2003 season, and people accustomed to aggressively attacking all their fires had to accept that they would let fires and parts of fires burn. One IMT was faced with multiple lightning fires of various sizes and very limited resources when they arrived at their assignment. No Type 1 crews were available, so the team worked with the resources available, only staffing one fire at a time. The IMT did not allow itself to get “sucked into” the trap of trying to control all their assigned fires at once with limited resources. This is consistent with the experience of other IMTs, including one forced to keep crews in camp due to lack of overhead.

Another IMT reported that the combination of confinement, containment, and control strategies assigned by the selected WFSA alternative was safe and cost effective. The fire was located in a roadless area, in a heavy fuel model 10 with standing dead Spruce and Lodgepole Pine, steep terrain and safety zones located several miles away with access only by trail or helicopter. According to the IMT, by using a combination of confinement, containment and control, they established firelines around a defined geographic area’s terrain features, fuel changes, and a perimeter road system. Consequently, fewer firefighters were required and all firefighters were able to work in areas with fewer hazards while preparing firelines. The IMT allowed the fire to reduce fuel loadings and create a fuel break between a community and the extreme amount of dead standing spruce in the fire area as well.

On one large fire, the IMT constructed a shaded fuel break in front of homes/cabins in the fire’s path as a suppression tactic. The fuel break was approximately 130 feet wide and was created as part of indirect line preparation using tree harvesters/processors and grapple skidders. The equipment removed ladder fuels and downed fuels, thinned remaining trees, which left the largest trees with adequate air space between their crowns. Conditions never allowed the IMT to burn out from the fuel break as planned. However, the fuel break did alter fire behavior enough to allow structure protection and wildland fire suppression resources to remain in the fire area and protect structures. Local residents who visited the site were pleased with the visual appearance of the large trees that were left, and the park-like setting.

On a Type 4 incident, the agency selected a strategy to let the fire burn itself out after taking into consideration 1) the current and predicted weather, 2) location of the fire, and 3) current and predicted fire behavior of the fire. This fire was located in a remote area of a wildlife refuge, and the fire staff of a nearby national forest made a daily detection flight of the fire. In three days the fire had completely burned itself out, and there were no complaints of any kind.

Numerous IMTs reported being distant from their fire. All types of teams reported using spike camps to overcome very long driving times or difficult backcountry access. However, respondents also reported that spike camps presented challenges. For example, one IMT referred to their incident as a test of air support operations, because they had as many as six spike camps in operation at one time. Another IMT, managing a large complex with a number of fires, found success with movable, low impact spike camps.

**Lessons Learned:**

- ☀ Managing large complexes with a number of fires may require the IMT to simultaneously employ a range of suppression strategies and tactics, including unconventional approaches as well as those that simply require dogged persistence.
  - ☀ In some circumstances, resource availability will dictate what a team is able to do. IMTs should take action on only those fires that they can safely and effectively staff. As one team put it “Only fight what you can safely, and don’t worry about some of the fires continuing to grow. And don’t let political pressure change your tactics. Prioritize fires at the onset of the assignment and again daily.” Sometimes you just need to watch the fire burn itself out.
  - ☀ Spike camps remain a viable alternative for getting firefighters close to the work, overcoming poor access, and mitigating long driving times and the need for extensive crew shuttle by helicopter. However, spike camps also present challenges and the IMT must staff and equip sufficiently to support them.
  - ☀ IMTs can also mitigate travel and access issues by having crews work from point-to-point, shuttling their vehicles between points and using “coyote tactics,” having crews camp where they stop work without supplying a fixed camp.
  - ☀ Locally contracted excavators can provide a very cost effective, safe, and efficient tool for constructing fireline and expediently mopping up.
  - ☀ Shaded fuel breaks constructed around structures in the fire’s path can represent an effective suppression tactic.
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## **Operations and Tactics in Australia**

**Background:** Many lessons were learned about how fires are managed and suppressed in Australia including the following:

Minimal handline is constructed on wildfires in Australia because of the fuels and topography. Fuels burn rapidly and access to many areas is minimal. No fire shelters are used, and firefighters use their vehicle as their escape route. The firefighter must always plan where they will drive to for safety, and be able to get to their vehicle quickly. Consequently, firefighters never get too far away from their vehicle.

Australians prefer burning out from roads and tracks (dirt roads) to line construction, though they do construct line on small, low intensity fires. Burning out, in most cases, goes quickly, and mop-up was occurring within two hours of most burnout operations and involved minimal water. Fuels tended to burn out quickly and heavy fuels (eucalyptus logs and trees) stopped burning when the heat was not concentrated, so just a little scraping and spreading of the heat extinguished the fire.

The Australians use the “Swing Shift” effectively. The operations included normal day and night operational periods with a Swing Shift that typically worked from noon until 0400. Swing Shift personnel mostly did the burning, and held what they burned, and consequently they did not always run through 0400, but would end the shift when they could no longer burn. The day operational period would also start burning when they could, and the Swing Shift would take over burning, allowing the day people to hold and patrol the areas that they had already burned. The added shift provided coverage without worrying about lag times for shift changes, reducing the potential for overlong shifts.

### **Lessons Learned:**

- ☀ U.S. firefighting agencies can learn from support assignments to foreign countries, bringing back novel and innovative approaches to the firefighting job.
  - ☀ In light, fast-burning fuels with low residence time, burning out from roads should be considered as an alternative to line construction.
  - ☀ A “Swing Shift” may provide improved operations and eliminate concerns associated with leaving critical parts of the fireline uncovered during shift changes. It also helps the IMT manage fatigue by reducing shift length.
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## **Quickly Completing Critical Burnout**

**Background:** On a fire, one IMT reported that they were able to quickly complete critical burnout operations by using aggressive tactics. The team used line constructed by volunteer fire departments on initial attack, aggressively continued dozer line construction and implemented burnout operations as soon as possible. Using these aggressive tactics, they were able to complete burnout operations just ahead of sustained 20 mph winds that hit the fire from all directions. Because they had completed the burnout, all their lines held, on that same afternoon, other fires in the area all experienced significant fire activity and growth, including the loss of structures.

**Lesson Learned:** Quick, aggressive action can complete critical tasks and can determine whether a team contains its fire or not. This type of fast, vigorous action may require that the team perform as if they are on initial attack; effectively deploying the resources on-hand and taking advantage of work completed by initial attack forces, rather than taking time to prepare a new plan and waiting for ordered resources to arrive.

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## **Supporting Initial Attack**

**Background:** Numerous IMTs, in addition to managing an incident, found themselves successfully supporting local Initial Attack (IA) operations during the 2003 fire season. For example, an IMT was tasked with supporting IA, made plans to meet that responsibility, and provided two helicopters and a hand crew to respond to an emerging fire, which was caught at 730 acres with the assistance of the IMT's resources.

Other IMTs found that supporting local initial attack operations provided them with challenges. For example, dispatching procedures and aviation support became the issue for one IMT. The IMT was assigned IA responsibility within their Temporary Flight Restriction (TFR) zone for their incident, but were also asked to support local agencies with IA outside of the TFR when requested. As the incident evolved, the IMT was asked for IA assistance several times, and normally sent a helicopter to assist with bucket work, or other tasks. However, the incident's aviation resources were responding as far as 30 miles away from their designated TFR, and flight following from the helibase became difficult. Consequently, the IMT's Aviation Branch Director raised safety concerns about flight following, communication, and general safety practices.

The IMT solved this potential problem by establishing a procedure for flight following and communications with the local interagency dispatch center. Under this process, once the incident's helicopters left the established TFR, the local dispatch would take over responsibilities for flight following, radio frequency control, and protocols for ground forces. Once this process was in place, IA assistance flowed smoothly, with fewer safety concerns.

**Lessons Learned:** IMTs can effectively support local initial attack forces. Discuss expectations with the host agency in advance and make formal plans. Collaborate as necessary with local resources, including dispatch centers.

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### **Changing Strategy with Changing Conditions**

**Background:** One IMT reported that the selected WFSA alternative called for indirect attack that would encompass approximately 30,000 acres when completed. The IMT felt that this strategy was very appropriate given the fuel type, fuel moisture conditions, fire weather, and observed fire behavior. The IMT began implementing this alternative by burning out at the heel of the fire on the west flank to provide an anchor point and protect a subdivision. However the fire received approximately 0.60" of precipitation over a two-day period. The IMT, with concurrence of the line officer's representative, changed strategy given the changed conditions. The new strategy secured the north and south flanks, tying into an escarpment on the east flank of the fire. The final fire size was approximately 3,500 acres. The IMT implemented the changed strategy by employing five Type 2 handcrews with helicopter support, which the IMT considers an incredible feat.

**Lesson Learned:** IMTs need to remain flexible and prepared to change strategy quickly as conditions change and opportunities present themselves.

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### **Type 3 Teams and Their Use in Extended Attack**

**Background:** Type 3 IMTs often assume fires from Type 2 and Type 1 IMTs. However, two agency units reported on their experience assigning Type 3 teams to manage extended attack fires prior to transition to a Type 2 or 1 team. In both cases, this approach increased leadership, provided safer and more aggressive suppression activities, and provided for a smoother transition to a higher-level IMT.

**Lesson Learned:** Type 3 IMTs provide an effective level of management on emerging fires, and offer effective management between initial attack and assumption of command by a Type 1 or 2 team. Type 3 teams can provide effective leadership, implement safer and more aggressive suppression actions and facilitate a smoother transition to a higher-level team.

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### **Role of Volunteer Fire Departments**

**Background:** An IMT worked with rural departments that had taken the initiative to train to NWCG 310-1 standards on two different fires. In both cases, the IMT was able to seamlessly incorporate these valuable resources into the Incident Action Plan (IAP), and the local forces were used both for structure protection and wildland fire suppression. In addition, the IMT relied on the local forces for area knowledge, flexibility and leadership. The volunteers' knowledge of the local

area allowed the team to incorporate safe, aggressive tactics in their suppression efforts. In turn, incorporating local forces into the suppression effort gave the local forces ownership in the suppression effort, increased community support, and helped to strengthen interagency relations.

Conversely, the IMT also encountered other local fire departments that had not signed up through local dispatch, forcing the team to go outside the local area to obtain needed support and equipment.

**Lessons Learned:**

- ☀ When IMTs encounter volunteer fire departments that have trained to NWCG 310-1 standards, the team can easily incorporate their resources into the IAP and rely on them for local knowledge and leadership .
- ☀ Incorporating local volunteers into the IMTs effort improves local relations and interagency cooperation.
- ☀ IMTs will encounter both well-trained, well-organized volunteer fire departments and those that essentially remain outside the system.

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**The Effects of Fuels Reduction on Suppression Efforts**

**Background:** Several respondents reported on the effects of recent fuel treatments on their suppression efforts.

One IMT was able to observe, first hand, the effectiveness of fuels reduction efforts on both Federal and private lands on two different incidents. On these incidents, previous prescribed burns decreased fire behavior, which allowed the IMT to use less intrusive tactics, including handline in place of dozer line to accomplish fire suppression objectives.

On a Type 4 incident, the IC reported that in the fire area, most of the local private property owners had worked the previous fall to clean up their property. One individual lost a cabin, trailer, two sheds, and a garage because brush, long grass and leaves were allowed to remain rather than being removed.

**Lessons Learned:** Previous prescribed burns and defensible space cleanup by property owners can decrease fire behavior and allow the IMT to modify their tactics.

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**Incident Within an Incident: Responding to a Downed Aircraft**

**Background:** An IMT reported on their reaction to a downed aircraft (helicopter that had been performing bucket work) that caused an incident within their incident as a notable success. This IMT includes procedures for an incident within an incident in their IAP, and addresses those procedures in its briefings.

In this case, notification of a downed aircraft by the Air Operations Branch Director triggered the IMT sub-plan. The IMT immediately established priorities that were announced over the command channel for search and rescue, firefighter safety, incident stabilization, and site security for investigation.

Having three Operations Section Chiefs assigned to the team allowed one field Operations Chief to take command of the scene with support from the Safety Officer. One Division Supervisor and his resources had already been pre-assigned to initial attack duties, and this division was immediately assigned to assist, since there was a fire associated with the crash. This arrangement saved time, since individual resources did not have to be called and assigned. The Communications Unit assigned additional recorders to monitor and record critical radio traffic, and the communication room was secured to keep unnecessary interruption away and to ensure privacy. As a result of these actions, the IMT had the first responders at the scene within ten minutes.

Another IMT reported that determining what duties and responsibilities the IMT had associated with an aircraft accident fatality proved problematic for them. This IMT overcame this challenge after the incident had been stabilized and the Command and General Staff conducted a strategy meeting with the agency administrator and Fire Management Officer (FMO). During this meeting, they identified the responsibility and roles of the IMT, those of the hosting agency and developed a plan.

The crash site became a branch of the incident and the IMT filled the information function. The agency took the lead with the investigation, though the IMT did order and receive the State Patrol's Accident Re-creation Team to assist with mapping and recording the crash site (the National Transportation Safety Board investigators appreciated their support.) The local Coroner did not have experience with this type of accident and was not well prepared, so the IMT's Safety Officer and IC, along with the host unit's FMO provided assistance with the recovery of the pilot. In the future the Medical Unit Leader will contact the local coroner to evaluate their capabilities when the IMT develops its plan.

**Lessons Learned:**

- ☀ IMTs should prepare internal team procedures for emergency response to “incidents within the incident” such as aircraft accidents and medical emergencies to ensure that all team members are familiar with procedures and train for them.
  
- ☀ IMTs should include procedures for emergency response to aircraft incidents, medical emergencies and other “incidents within the incident” in the Incident Action Plan (IAP) and address them in briefings.

- ☀ IMTs need to know their own capabilities before they are needed and know what local resources are available to them for emergency response, accident and fatality investigation, etc.

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### **Dealing with Host Specific Qualifications Systems**

**Background:** Several IMTs encountered a geographic area coordination center's (GACC) qualification system that differed from the NWCG 310-1. One team mistakenly believed this to be the policy of a single, state forestry agency. However, in actuality, the GACC adopted a staged qualification system, which allows, for a specified period of time, non-qualified contractor personnel to occupy line positions. During the time period when an individual who is not qualified is occupying a position, the GACC expects IMTs to use the resource and "pair them up" with a qualified resource. For example, the IMT would pair a contract engine with an engine staffed by a qualified Engine Boss. Next year, these same engines will be required to meet 310-1 standards, but during the time the IMTs were using them, they did not meet 310-1 qualification standards.

One IMT found that their Safety Officer and Operations staff could not, in good conscience, put these individuals on the line without proper supervision and didn't feel comfortable with making them a task force by combining them with an engine with a fully qualified Engine Boss. Many Engine Bosses are not qualified as Task Force Leaders, and need to focus their leadership on his or her own module.

This IMT's solution was to stage the contract engines lacking qualified leadership until the IMT could order and fill Strike Team Leader and Engine Boss resource orders. This process took less than one operational period, and the contract engines were put back to work. The IMT documented their decisions and actions and gave them to Area Command. The Area Command and other IMTs found difficulty with this issue, which is reported elsewhere in this report.

**Lesson Learned:** IMTs will encounter hosting units who have modified their qualification and certification systems to allow personnel on the fireline that do not meet NWCG 310-1 standards. IMTs must be prepared to address this situation in their policies, procedures and planning.

**Note:** This issue is also discussed in the Safety Function section of this report under the heading Contract Engines/Engine Boss Qualifications (Page 85.)

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### **Delayed Release of Resources**

**Background:** One IMT reported that when release of operational resources required delays of up to 24 hours, they had good success with assigning those resources that had been released but had not departed to initial attack, permitting

remaining resources to focus on the immediate, daily operational needs of the incident rather than on initial attack readiness.

**Lesson Learned:** IMTs can strike a balance between providing local initial attack capability, staying focused on meeting incident objectives, and managing delayed demobilization by assigning delayed, demobilizing resources to initial attack.

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### **Coordinating Local and Incident Air Operations Plans**

**Background:** On one incident, the IMT recognized that the local aviation staff was already participating in a pre-planned event, a Presidential visit.

On another incident, a problem surfaced when fire activity picked up and conflicts arose between the incident's helibase and the hosting agency's initial attack (IA) helibase located within a few miles of each other. The problem stemmed from a lack of communication between the two helibases while running simultaneous operations.

**Lessons Learned:** In the first situation, the IMT Air Operations Branch Director worked with the local plan until the event was over. In the second case, The IMT Air Operations Branch Director ordered a complete shut down of Air Operations, facilitating a meeting between the supervisors of each operation. Once the communication problem was solved operations resumed safely and efficiently.

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### **Incident Aviation Operations Facilities**

**Background:** An IMT managing a fire, initially set up their Aircraft Base Radio Operations (ABRO) in a private hanger at the local airport, using hand held radios and an external antenna. This arrangement did not work well, so a helibase operations trailer was ordered and used to isolate the ABRO, and provide higher power radios for positive communication.

Another IMT found that, although the county airport where they were set up was a low use, general aviation facility, the addition of 11 fire aircraft to the general aviation traffic necessitated a temporary control tower to prevent conflicts. The IMT used an FAA Temporary Tower to control and manage take-off and landing communications for the airport.

**Lessons Learned:**

- ☀ Purpose-built helibase operations trailers allow the IMT to isolate the Aviation Base Radio Operator from distraction and provide high power radios for positive communication.

- ☀ When operating incident aviation operations from public airports, a temporary tower may be necessary to mitigate the impact of incident operations on normal airport operations and to prevent air traffic conflicts.

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### **Checking All Structures on Interface Fires**

**Background:** A Type 4 Incident Commander (IC) reported that any loss of private structures is unpleasant enough without losing properties unnecessarily. When the IC's fire was detected, an aircraft reported four structures involved and several being threatened on a fire in hardwood litter. The fire started late in the day so the responders knew it would not go far. On the other hand, with the threat to structures and 45 minutes travel time to the incident, the initial attack IC ordered heavily. As it turned out, the agency dispatched more equipment than was needed to control the fire, and most units were cancelled shortly after the IC arrived and sized-up the fire. However, the responding resources nearly lost a structure that they had not immediately recognized as threatened. They found this structure after all easily visible structures had been checked and most resources were attending to the wildland fire

**Lesson Learned:** It is very important to perform a thorough check of all buildings in the fire area. Keep adequate structure protection resources on the fire scene until this check has been completed.

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### **Monitoring Matrix for Rehabilitation Work**

**Background/Lesson Learned:** An IMT managing a fire found that the incident suppression rehabilitation needs created by five IMTs presented a significant challenge that tested both the resource advisors and the team. The task gave the team and resource advisors an opportunity to try a rehab "monitoring matrix", on which the Operations Section and resource advisors signed-off identified tasks at the end of each day.

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### **Lessons Learned: Type 2 Crew Bosses**

**Background:** During 2003, the Lessons Learned Center interviewed Type 2 Crew Bosses, many of whom take out eastern crews and crews from the Lake States. The respondents take the Crew Boss job very seriously, and several have been taking crews out for 10 years or more. Some have experienced the evolution of Type 2 crews from agency "regulars" with abundant experience, to "pick-up" crews with a mix of multi-agency personnel and casuals. The respondents discussed their many experiences, including lessons learned related to four key areas:

#### Crew Boss is a People Job

Overwhelmingly, these Crew Bosses believed that their greatest success lay in their ability to bring a crew together, achieve crew cohesion, and get the crew

focused on having a safe assignment, doing a good job and getting a good rating. Several Crew Bosses noted that, for them, this means taking new firefighters, often on their first fire, and properly preparing them to fight fire. Several respondents emphasized that it is important to approach the Crew Boss position as a people job. The respondents gain a high degree of personal satisfaction when they can form an effective crew, achieve crew cohesion and bring everyone home safely.

### The Greatest Challenges Do Not Result from the Fire or the Nature of the Work

Most Crew Bosses agreed that the greatest challenges are in dealing with interpersonal problems that crewmembers bring from their home unit, and in assuring the safety and welfare of the crew. Again, the respondents emphasized the importance of approaching the crew boss position as a people job and the need to figure out how to develop crew cohesion quickly in a short-term environment. Some mentioned challenges that are inherent in a system that puts crews together “on the fly.”

### Training Rookies

Some Crew Bosses indicated that training rookie firefighters on a Type 2 crew presented their greatest challenge. Type 2 firefighters must learn to keep calm, show respect, obey instructions, and be part of a team/crew. Training rookie Type 2 firefighters takes time and care.

### Recognizing the Importance of the Crew Boss Position and Gaining Experience

Due to the nature of the Crew Boss position, people can move through the position relatively quickly and become a Strike Team Leader- Crew (STCR) without much Crew Boss experience. The same is true of progressing from STCR to Division/Group Supervisor (DIVS.) Consequently, people in these overhead positions may not fully understand the challenges of getting 19 people on the line everyday. This lack of experience may foster unrealistic expectations.

## **Lessons Learned:**

### General Approach

☀ The keys to a crew boss having a positive assignment are:

1. Maintaining a good attitude,
2. Having a core of experienced people to help guide the crew,
3. Having a variety of assignments/experience as Crew Boss,
4. Keeping the atmosphere positive, and
5. Resolving attitude problems quickly.

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- ☀ Understand that being a Crew Boss is only partially a fire job, and is really a people job.
  1. Enjoy dealing with people,
  2. Recognize the Crew Boss's responsibility to develop people,
  3. Enjoy seeing a team come together, and
  4. Recognize and work with diversity.
- ☀ Do the best you can, draw on your own life experience. Draw on supervisory experience and skills from your regular job during the fire assignment - supervise!
- ☀ Have empathy for your crewmembers - place yourself in the crewmember's situation and ask yourself "How would I like to be treated?" Try to understand.
- ☀ It is very important that the Crew Boss maintain situation awareness. Maintain the "big picture". Step back. The Crew Boss can't be a worker, and the crew needs to understand why.
- ☀ Use the crew's diversity to learn. A good example may be learning Spanish language skills from Hispanics on the crew.
- ☀ Know your people as individuals.

### Organizing/Becoming a Crew

- ☀ When the crew first gathers at the mobilization center and before getting on the plane or bus, group up, meet and greet, and assess experience.
- ☀ Get your organizational structure up and running immediately, in the first three or four hours after the crew is assembled. If possible, get squads made up of the right people based on their experience and skill level. Separate rookies and distribute them among the squads under the monitoring of experienced mentors.
- ☀ State your expectations clearly while still at the mobilization center. Have your crew alternates right there, ready to go. Communicate expectations and expected commitment for the next two weeks. People tend to commit, which provides the crew boss the opportunity to remind them of their commitment when needed.
- ☀ The 14-day assignment has been an improvement, as has been the 16-hour duty day limitation.
- ☀ Establish a sense of confidence and trust immediately in the first day.

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- ☀ Get everyone functioning and thinking as a crew within the first day or two, even when in travel status.
- ☀ Assess your crew. Know who has experience and whom you can look to for help and assistance.
- ☀ Squad Bosses are key to Crew Boss success. Pick Squad Bosses who can lead by example.
- ☀ Rely on crewmembers to help out. Lead by example and delegate.
- ☀ Mixing males and females on the crew brings balance to the crew and provides a more normal working environment.
- ☀ The Crew Boss is not one of the crewmembers. It is not your job to fit in with the guys. The crew has to know that you are in charge. Set your structure from the beginning.
- ☀ Cohesion builds after people get to know each other and relationships build. This takes several days of working together. Seek ways to build relationships early and quickly. Building an effective crew requires bonding and relationship building.
- ☀ To have an effective crew, you need to build a cohesive team while still maintaining personal space, personal attention and a personal touch by recognizing and treating people as individuals and as part of a team. Allow for personal attention and the ability to address personal problems while maintaining privacy. Provide opportunities for crewmembers to discuss personal issues by making people aware of your personal schedule/routine and urging people to speak on personal time, for example, after the After Action Review (AAR.)

### Training

- ☀ Generate enthusiasm. People learn well and are influenced for the long-term when their trainer is enthusiastic.
- ☀ Have mentors. Use experienced people to train the inexperienced. Encourage experienced firefighters to mentor the rookies informally. Mentors can be assigned either formally, or informally in such a way that the rookie does not know they have been assigned a mentor
- ☀ Allow people to make mistakes from which they can learn. Allow people room to figure things out on their own and be ready to provide guidance when appropriate.
- ☀ Exercise patience and open-mindedness, both with the new people and the “semi-new” people who may have learned things the wrong way.

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- ☼ Many firefighters lack an understanding of basic ICS and basic organization.
- ☼ Provide constant reinforcement, both to individuals and the group emphasizing teamwork and accountability.
- ☼ Provide reassurance and personal care.
- ☼ Use story telling so that rookies learn from the more experienced people.
- ☼ Make sure that the rookie's first experience is a positive experience.

### Conflict

- ☼ Keep interpersonal conflict to a minimum and maintain a positive work environment.
- ☼ Handle conflict directly.
- ☼ Get people together and get them talking about issues.
- ☼ The 14-day assignment and the work/rest guidelines have been a real improvement. 14-day assignments minimize interpersonal conflict and the crews are both safer and more productive.
- ☼ When resolving crew conflict, recognize that often you are not going to permanently fix the problem and that you can only fix the immediate problem that is affecting the assignment.
- ☼ When resolving crew conflict and resolving performance issues, use the fact that people don't want to get kicked-off the crew for reasons of pride, income, etc. However, this must be used sparingly, with judgment, and in an unspoken manner.
- ☼ Apply peer pressure when resolving conflict, use your Squad Bosses instead of allowing the Crew Boss to resolve all issues.
- ☼ Remember that you do not have the same kind of leverage with "pick-up" crews from numerous agencies as you do with crews made up from a single agency or single locale.
- ☼ Use the resources that the IMT and your home unit provide to help solve people issues. Know who to seek help from and use them.

### Safety

- ☼ Constantly monitor the crew and maintain situation awareness.

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- ☀ Constantly review tactical safety doctrine (10 and 18, LCES, downhill line construction guidelines, etc.)
- ☀ Make sure squad bosses have accountability for their people at all times.
- ☀ Focus on bringing everybody back from the assignment safely.
- ☀ Boredom and complacency on cold mop-up/grid searching can really cause problems. Introduce a little competition, but be careful with this.
- ☀ A Crew Boss needs to communicate with, work with, and negotiate with the STCR or DIVS. Help the STCR or DIVS understand your crew's capabilities. Be honest and up front.

### Crew Composition

- ☀ Type 2 IA crews have more experience and are often more enjoyable to take out. Agencies may start having a hard time finding people who want to take an interagency Type 2 crew out.
- ☀ Interagency Type 2 crews are much more complex and difficult than a single agency crew because of variable levels of training, differing expectations, different approaches to conduct and ethics, and because of multiple agency paperwork requirements that tax the Crew Boss. Single agency crews are better because there are fewer of these problems. Interagency crews are more like 20 individuals and the Crew Boss has less ability to apply peer pressure. When leading an interagency crew, use more structure, recognize when there is a lack of experience or cohesion, use more directive supervision, and treat these crews as more of a developmental opportunity for its members.
- ☀ A mix of agency and AD personnel can work, but the Crew Boss must make it work. The Crew Boss sets the tone that enables crew cohesion.

## **LESSONS LEARNED RELATED TO THE PLANNING FUNCTION**

### **The Planning Function on All Risk Incidents**

**Overview:** The Space Shuttle Columbia Recovery Effort brought together a mix of agencies that normally do not work together. According to the respondents, working under the Incident Command System and unified command, various local, state and federal agencies, including the National Aeronautic and Space Administration (NASA), The environmental Protection Agency (EPA), the USDA Forest Service, the Texas Forest Service (TFS) and the Federal Emergency Management Agency (FEMA) were able to integrate information and develop an effective Incident action plan and mapping product. Respondents reported that they learned from the following successes and challenges in three key areas, including incident meteorological services, obtaining overhead resources and knowing resource status.

#### **Incident Meteorological (IMET) Services at the ICP**

**Background:** On the recovery mission, one incident management team IMT felt that having Incident Meteorological (IMET) services at the ICP provided real time monitoring and mitigation of weather related safety hazards. When thunderstorms approached, the IMET was able to give timely warning. This was key to pilot and personnel safety.

#### **Obtaining Overhead Resources on an All Risk Incident**

**Background:** Obtaining overhead personnel in all functions proved extremely difficult and could have had a significant impact on incident operations. Working through the delegating agency, which was the TFS, the IMT was able to get authority to name request critical positions needed.

#### **Knowing Resource Status**

**Background:** The Resource Ordering Status system (ROSS) provided valuable information for building the Operational Planning Worksheet (ICS 215) for future operational periods. However, they also report that it would have helped to identify at check-in whether contract crews were national or regional. Providing a field to indicate the last operational period for all resources that could be queried and edited would also be helpful.

#### **Lessons Learned:**

- ☀ Incident Meteorological (IMET) services at the ICP can provide real time monitoring and mitigation of weather related safety hazards.
  
- ☀ Working through the host agency to name request resources can provide a means of working around critical resource shortages.

- ☀ ROSS provides valuable information for building the ICS 215 for future operational periods. However, identifying contract crews at check-in as either national or regional and providing a field to indicate last operational period for all resources would facilitate planning section work.

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### **Resource Ordering and Status System (ROSS): A Work in Progress**

**Overview:** IMTs reported numerous challenges associated with the Resource Ordering and Status System (ROSS).

#### Name Requests

**Background:** Many times during the 2003 season, IMTs resorted to name requests to obtain critical resources, and IMTs found ROSS related issues that interfered with name requests particularly troubling. According to one IMT, the process required for name requesting is very cumbersome. There are simply too many screens to go through to get a name request processed.

This IMT and others expressed frustration that ROSS would not allow name requesting of aviation support personnel who were frequently in critically short supply. Unless circumvented by name ordering through state or local government, the inability to name request hurt incident aviation operations. IMTs reported having critical aviation personnel orders open for days, and aviation contractors were frustrated when they were not able to fly because the IMT had insufficient managers available.

#### Line and Camp Overhead/Mid-Level Supervision

**Background:** IMTs report that suppression resources were arriving while mid-level supervision orders (for both line and camp) remained unfilled, which is not cost effective.

One IMT reports overcoming this challenge by delaying orders for additional line resources until mid-level supervision (line and support) were confirmed with estimated times of arrival. The IMT also worked with the dispatch system to pair crew/engine module orders with Strike Team Leader and Task Force Leader orders. This IMT also used national contract engine resources in strike team/task force configurations with contractor Strike Team Leaders or Task Force Leaders.

#### Line Resource Orders

**Background:** One IMT reports that resources arrived at the ICP with no Overhead (O) numbers or Crew (C) numbers. Both Area Command and Expanded Dispatch assigned these resources to the incident, but at times O and

C numbers were not assigned for days afterwards. The IMT assigned fictitious numbers so that check-in could be accomplished and time could be posted, allowing the resources to fight the fire. The IMT reconciled databases at a later date.

IMTs report that ROSS does not allow for easy transfer of resources from one fire to another. In one situation, when lightning storms swept their area, the IMT inherited many new fires and several new fire complexes. The IMT reassigned and loaned resources from one fire to another as needed to avoid getting tied-up with ROSS, and the associated problems and delays of ordering new resources. This approach caused some complication, both internally and with expanded dispatch, but the fires were fought and valuable time was not lost. The IMT resolved all the issues at a later date, and databases were updated.

Teams also reported that they overcame their ROSS related problems at the local level by tracking resources the old fashioned way on resource order forms and cardstock.

**Lesson Learned:** The Resource Ordering and Status System (ROSS) hampered IMTs, and teams are experimenting with numerous means for circumventing ROSS, including name requests through state and local government agencies, returning to pre-ROSS cardstock resource ordering and tracking systems, and synchronized approaches to ordering line resources and overhead. None of these approaches are desirable as long-term solutions, and issues related to ROSS need to be resolved systematically.

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### **The Interface Between IMT and Expanded Dispatch**

**Background:** Several teams reported that, out of necessity, they worked very closely with the expanded dispatch of the host agency to overcome a variety of problems. Some respondents report overcoming ROSS related issues by working very closely with the host agency's expanded dispatch. Others reported that they needed to overcome problems they had with the expanded dispatch. In some cases, the local expanded dispatch was lacking and led to numerous instances of duplicate requests for information and delayed information management for alerts, fire behavior, and weather and safety updates.

**Lessons Learned:** Some IMTs overcame problems with expanded dispatch by assigning IMT personnel directly to the expanded dispatch. One IMT assigned a Logistics Section Chief to expanded dispatch and another to the ICP. Others overcame expanded dispatch related problems by conducting conference calls once or twice a day.

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## **Incident Status Summary (ICS Form 209) Program Not User Friendly**

**Background/Lesson Learned:** IMTs report that the ICS Form 209 program is not user friendly and is hard to navigate. One IMT reported that, with the present 209 entry process, there is a potential for data to be lost during input. This team addressed this issue by creating an MS Word document containing the standard 209 text. The document was printed out, edited by the IC, and then block copied into appropriate sections of the ICS 209 form. The word document was saved for later reference.

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### **Sand Tables: Planning and Information Tool**

**Background:** Taking a cue from the military, one team used a sand table as a planning tool. The sand table provides an excellent tool for tactical discussions with the operations function; tactical and strategic discussions with the entire team and/or agency administrators; and facilitating discussions with local landowners, residents and local officials.

**Lesson Learned:** A sand table can provide an excellent tool, not only for its intended purpose of strategic and tactical discussion, but also to facilitate discussions with local landowners, residents and local government officials.

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### **Planning for Contingencies**

**Background:** One team reported that they established back-up plans for each operational period in case fire behavior required them to abandon their original plan.

**Lesson Learned:** Teams should establish contingency plans. This is related to institutionalizing the concept of error resiliency, and to using contingency planning and the establishing trigger points as part of that concept.

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### **Infrared Interpretation at the Incident**

**Background:** One IMT reported that they had a fixed wing infrared (IR) pod and an IR interpreter assigned to their incident. This proved to be a great concept, allowing for a group review of the flight data, with an interpreter present who was dedicated to the IMT.

An IMT reported that they had success using the palm IR from an aircraft and providing maps of hot spot locations to line resources prior to the operational period.

**Lesson Learned:** Taking advantage of available IR resources can enhance both planning and operations. The IMT can participate in group review of IR

flight data enhanced with an IR interpreter participating and use IR resources to provide maps to line resources for the operational period.

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### **Preventing Archeological Damage/Tracking Areas Cleared for Operations**

**Background:** When operating in areas of cultural and archeological sensitivity, IMTs are faced not only with an important resource protection issue, but also one with serious social and political implications.

One IMT reported their experience in which they needed to prevent damage from fire suppression activities to one of the most archeological sensitive sites in the nation. This IMT ordered a large number of line-qualified archeologists to their incident. One or two archeologists were assigned to every crew on the line. The archeologists surveyed the area prior to the crew going to work, located line locations and flagged them. The IMT decided to use retardant and bucket drops to establish line in extremely sensitive or inaccessible areas to minimize damage in canyons where fire became a safety issue. The retardant and bucket drops worked in the fuel types involved on this incident. The IMT also selected a strategy that allowed the fire to run into a previously burned area, which worked to stop the forward spread of the fire.

Another fire was located in an area that permitted dozer line construction as part of the perimeter containment of the fire. However, the area had not been completely surveyed for archeological sites. The IMT completed archeological surveys on this incident with the help of para-archeologists. However, controversy erupted over whether the team was implementing their approved strategy without adequate consultation and compliance that assured that areas had been approved before the dozers began their work. The IMT established a system by which the para-archeologists assigned to the fire documented, on their Crew Time Report (CTR,) what division they were working on daily, providing the IMT with an easy method of tracking and answering questions about clearance. This IMT recommends that all assigned archeologists define their daily assignment on a CTR, to avoid confusion and conflict over implementing approved strategy vs. complying with requirements for archeological surveys.

Another IMT reported a different approach. This IMT assigned their archaeologists to the Situation Unit, which provided necessary oversight of daily work assignments and facilitated information transfer and necessary documentation.

#### **Lessons Learned:**

- ☀ In areas of substantial archeological or cultural resource sensitivity, assign archeologists or para-archeologists directly to crews and other resources on the line to survey areas, locate line, and guide the actions on the ground.

- ☀ Consider alternative tactics in areas of archeological or cultural resource sensitivity to minimize damage.
- ☀ IMTs operating on incidents with cultural or archeological resource issues would be wise to establish a system for assuring which operational areas have been surveyed and cleared for fire operations.
- ☀ When archeologists or other cultural resource specialists are necessary, assign them to the Situation Unit to provide oversight of daily work assignments and facilitate information transfer and documentation.

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### **Preventing the Spread of Noxious Weeds**

**Background:** One IMT reported that they worked for a hosting agency that expressed strong concern over the spread of noxious weeds and suggested that the IMT set up numerous wash stations for equipment to curb the spread of noxious weeds from one area to another. The IMT accommodated this request by setting up two different wash stations for equipment.

**Lessons Learned:**

- ☀ The IMT is there to meet the host agency's needs, and those needs may require actions that are unusual to the IMT. Remain flexible and responsive.
- ☀ Wash stations for equipment can help prevent the spread of noxious weeds.

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### **Heli-Mulching on Rehabilitation**

**Background:** One IMT reported that they used helicopters to aerially apply 1,300 tons of weed-free straw to severely burned areas, totaling 500 acres, located in a municipal watershed. The operation went very efficiently, using two and three aircraft over a period of seven days. The IMT used two locations to load nets for helicopter hookup. Turnaround time ranged from two to six minutes, with approximately one minute necessary to load nets. Approximately 1,400 loads were delivered, requiring approximately 2,800 hooking actions under hovering aircraft. Three particular challenges (contracting, hotspots and straw) were encountered and overcome.

#### Contracting

Since the project was not an "emergency" for procurement purposes, normal contracting regulations applied. Consequently, the IMT had to plan and prepare for seven days before beginning the heli-mulching operation. This was significantly slower than if they had access to emergency equipment rental agreements (EERA), but was significantly faster than normal contracting actions.

### Hotspots

Straw was applied to vast areas well inside the fire perimeter, including areas that had not been mopped up and had received no significant precipitation. As expected, hot spots surfaced, and though helicopter pilots directed ground crews to visible smokes, some straw did ignite resulting in the loss of approximately five to ten acres. Helicopter bucket work and precipitation after the operations were completed minimized this problem.

### Straw

Straw was not immediately available in the local area to meet the need. The IMT requested certified weed-free, dry straw in 3'x 4'x 8' or 4'x 4'x 8' bales, approximately 1 ton each, with a chop (cut length) of 6" to 10" long. Loaded semi-trucks could haul approximately 25 tons. Due to travel time, contractors had difficulty making daily deliveries of 100 tons. The helicopters could fly between 200 and 300 tons daily, and the IMT had not anticipated the delay in delivery of straw. An alternate source was located to speed delivery, otherwise the IMT would have had to ground the aircraft due to lack of straw.

### **Lessons Learned:**

- ☼ Helicopters can be effectively used to spread straw and other erosion control materials using a safe, well managed, production oriented cargo operation.
- ☼ Treating fire suppression rehabilitation as part of the emergency would enable the use of emergency equipment rental agreements (EERA), significantly speeding accomplishment of the activity over normal contracting actions.
- ☼ Straw applied well inside the fire perimeter, in areas that have not been mopped up may ignite and result in the loss of the straw. Helicopter bucket work and precipitation after the operation can minimize the problem.
- ☼ IMTs need to assure adequate sources and delivery times prior to commencing production operations that are dependent on certain materials.

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## **Geographic Information Systems (GIS) Support**

**Background:** Several IMTs recommend having a GIS Technical Specialist dedicated to the team. One IMT included a GIS Technical Specialist in their initial order. Having this position with the IMT from the outset of the assignment, along with strong local GIS support, helped the Situation Unit respond quickly to mapping requests. An IMT working on the Space Shuttle Columbia Recovery

Effort also found that personnel with GIS skills were a key component of the Situation Unit's capability to support the complex mapping process required by this incident. IMTs feel that the GIS Technical Specialist position will likely become a more important, permanent resource to teams.

On the other hand, an IMT on the recovery effort found that the absence of onsite GIS presented them with a challenge, and that map acreage was being estimated using manual dot grid techniques from the beginning of the incident. This method led to an inflated count of cumulative acres searched and an underestimation of acres remaining to be searched. The acquisition of GIS capability at the ICP enabled the team to resolve the error and successfully plan for and obtain adequate resources to complete assigned search grids. This IMT agrees that on-site GIS support should be ordered early.

On a complex of fires, the IMT found that the data layers for the different fires on the complex were not compatible. Consequently, it took the IMT about three days to get the maps of the complex back to the standard. This situation reaffirms the need to move toward standardized software, products, and filing systems. This IMT mentioned the following additional points:

- The previous team had not used commercial mapping systems.
- The IMT was not able to get a plotter on site, but the district was quite generous in giving support.
- Having a second GIS technician helped meet the 2:1 work/rest ratio.
- A team trailer to haul their own plotter would be best.

#### **Lessons Learned:**

- ☀ GIS capability is quickly becoming an expectation for Incident Management Teams, and personnel with GIS skills can be a key component of the Situation Unit's capability to support the mapping requirements of an incident, particularly complex incidents. GIS Technical Specialists may become a permanent resource to teams, a standard part of a team's initial order, or at least an early consideration in ordering.
- ☀ There is a need to use standardized, commercial software, products and filing systems.

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### **I-SUITE: Requires Training and Experience**

**Background:** I-Suite is now a national program allowing easy transition between IMTs. For example, one IMT found that changes to I-Suite allowed them to track multiple "P-Codes," avoiding confusion when the IMT inherited numerous new fires. However, the I-SUITE program presented challenges throughout the season. Many of the problems stemmed from a lack of

experience, and a lack of understanding of how the program works and how each of the individual programs relates to the other.

One IMT found that the IAP module presented a challenge from the beginning, a challenge they say they overcame with pure persistence, by training people to contribute their parts of the IAP in a timely manner; and by having a lap top computer available to team members to contribute their part. This IMT was not staffing a night operational period, which allowed the IMT time to get the quirks identified and documented.

An IMT, assigned to the Space Shuttle recovery effort, found that providing training to people involved with data input and output on the incident helped to alleviate some of the ISUITE related problems. This team believes that having qualified Status Check-In personnel assigned to the IMT would also help mitigate the problem. ISUITE check-in recorders learned fast, but should have been exposed to the program before reporting to an incident. Most entry errors were due to lack of formal training and operating procedures that differed by region.

**Lessons Learned:**

- ☼ I-Suite is developing as a national program; allowing easy transition between IMTs. However, the I-SUITE program presents challenges, most of which stem from a lack of training and experience.
  
- ☼ Qualified, properly trained and experienced Status Check-In Recorders and a single standard operating procedure would facilitate continuing implementation of the ISUITE program.

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**Evacuation Planning: Planning and Presenting Management Actions**

**Background:** On a fire, two communities had been warned of the potential for evacuation. The IMT, along with the county sheriff's office staff, quickly established "management action lines" for both the "requested evacuation" and "ordered evacuation" stages. This information was presented efficiently and effectively at information meetings held during following evenings.

**Lesson Learned:** Proactive evacuation planning involving local government officials and supported by effective public outreach and information is essential when a fire threatens structures or communities.

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### **Structure Protection Planning: Using a Technical Specialist**

**Background:** One IMT reports that they put their structure protection plan together quickly. Then, once they received a small amount of rain, they took time to put together something better, which they found to be a challenge.

**Lesson Learned:** This IMT brought in a Technical Specialist to complete the structure protection plan, and found that using a Technical Specialist to handle specialized projects, such as a structure protection plan, is a good way to accomplish the work.

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### **Round Trip Airline Tickets**

**Background:** An IMT assigned to the Space Shuttle Columbia Recovery Effort found that some resources came to the incident with round trip tickets. While a round trip ticket is less expensive to the sending agency, it is rare that the original return date can be met. Consequently, additional expenses and additional work for dispatchers, both at the home unit and at the receiving unit, and for the Planning and Operations Sections of the IMT result when tickets must be changed. This IMT points out that most resources “forget” to mention at check-in that they have this type of ticket, complicating matters at demobilization time. Unfortunately, the IMT reports that they were not able to overcome the issue properly, as the resources were not forthcoming with information in a timely manner and because demobilization was rushed by a need to push it up by one day.

**Lesson Learned:** Some resources will arrive at the incident with round trip airline tickets, which can complicate demobilization and incur costs and work for the incident. Determine the nature of the resource’s airline arrangements at check in.

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### **Australia: The Lack of Current Maps**

**Background/ Lesson Learned:** On the Australian assignment, the lack of current maps of the incident presented a continual challenge. The fire was two million acres and, according to the U.S. personnel, the intelligence gathering was behind the power curve. Getting current maps on a daily basis was impossible. The U.S. team used an area map, drew in updates from the daily briefings, and then used scouts to check out specific areas to fine tune the maps that they were provided.

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## **LESSONS LEARNED RELATED TO PRESCRIBED FIRE**

### **Landscape Scale Burn Plan**

**Background:** An agency planned and conducted a landscape scale prescribed burn, treating 15,000 acres within a single fire management unit using one burn plan. Individual burn units were implemented using incident action plans as the principle planning and documentation tool. This level of accomplishment would never have been realized had managers been required to write a separate burn plan for each of the 16 burn units that were burned.

The Cape Sable Seaside Sparrow (CSSS) is an endangered species that occupies flammable habitat immediately adjacent to several of the burn units. Some burns were conducted once water levels were adequate to minimize fire spread, and these units burned without the installation of holding lines that would have resulted in scarred landscape. Ignition was timed to take advantage of high water levels and favorable winds blowing away from CSSS habitat.

#### **Lessons Learned:**

- ☀ Agencies can meet large burning acreage targets by planning on a landscape scale, using a single burn plan (rather than separate burn plans for each unit) with individual burn units implemented using incident action plans as the principle planning and documentation tool.
  
  - ☀ Employ innovative burning strategies to protect threatened and endangered species habitat in and around burn units and to prevent undesirable resource impacts.
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## **LESSONS LEARNED RELATED TO WILDLAND FIRE USE**

### **Managing a Large Scale Fire Use Incident Without a Fire Use Team**

**Background:** District and forest personnel, with assistance from crews and overhead from on and off the forest, managed a 58,000-acre wildland fire use incident without an established fire use team. This experience allowed local managers to gain hands-on knowledge in regard to dealing with fires for resource benefit.

Stage III of the Wildland Fire Implementation Plan (WFIP) requires input from all resource advisors, but according to the respondents, involving other resource advisors in the WFIP proved difficult. They believe that line officers and their staff must be committed to contributing to the Stage III processes, especially when threatened and endangered species habitat, lies within the Maximum Management Area (MMA.) Despite their success with the project, the respondents were not able to involve the line officer and specialists adequately, and fire personnel completed the Stage III processes of the WFIP.

The respondents also pointed out that fire use outside of wilderness areas could greatly impact forest permittees, especially grazing permittees. On this project, range staff personnel worked with the permittees to move cattle to unaffected locations to accommodate fire incursion into grazing allotments under natural conditions.

**Lessons Learned:**

- ☀ District and forest personnel may be able to manage a fire for resource benefit without an established Fire Use Team. Participating personnel will benefit by gaining hands-on experience.
  
- ☀ WFIP Stage III processes require the participation and input of disciplinary specialists. The line officer and their staff must commit to participating and contributing to these processes, particularly when endangered species habitat lies within the MMA or permittees will be impacted by fire use.

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**Fire in Mexican Spotted Owl Habitat**

**Background:** The IMT managing a fire use incident learned that it is possible to allow fire to visit Mexican Spotted Owl habitat and achieve positive results. The forest allowed fire to move through numerous owl Protected Activity Centers (PACs) or introduced fire into them in a manner that benefited the habitat. Fish and Wildlife Service personnel visited the treated PACs and were pleased with the results.

**Lesson Learned:** Fire can be allowed, or introduced into Mexican Spotted Owl habitat in a manner that benefits the habitat.

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## **LESSONS LEARNED RELATED TO THE SAFETY FUNCTION**

### **Providing for Safety Under Extreme Conditions**

**Background:** IMTs operating during 2003 reported that they faced challenges when providing for firefighter safety due to extreme fire conditions. One IMT reported that, on their incident, extreme fuel dryness, heavy fuels in very inaccessible terrain, potential for explosive fire behavior, a lack of safety zones and a large number of spot fires presented challenges to their efforts to provide for firefighter safety. The IMT overcame these challenges when a break in the weather allowed direct attack and allowed the team to use areas where stand-replacing fire had occurred (the “black”) as safety zones.

On another fire, an IMT reported challenges associated with working safely in a fuel type consisting of thousands of small tree stems per acre and areas of decadent timber with an enormous number of snags. The risk of sawing accidents, slips, trips, and falls was significant. Every briefing emphasized that supervisors needed to actively take responsibility for their crew’s safety during each entire operational period so that the crewmembers stayed safe and sound each day.

**Lesson Learned:** Extreme conditions can present enormous safety challenges. Sometimes these challenges cannot be completely overcome, but only mitigated through improved briefings or by modifying strategy and tactics. Other times, a change in weather or conditions may be required before tactics or strategy can be adapted to provide for firefighter safety.

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### **Safety Position at Area Command**

**Background:** On fires, area command teams established safety positions to provide a service to the agency administrators. Primary responsibilities were recognition of logistical and hazard exposures and identification of trends.

**Lessons Learned:**

- ☀ Fill an Area Command safety position for the purpose of coordinating safety functions between multiple IMTs.
  
- ☀ Monitor to ensure that the Area Command safety position does not become involved in operational safety, but remains more broadly focused on trends, hazard exposure, and logistical support related to safety.

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### **Safety On an All Risk Incident**

**Background:** Respondents reported that, although the Space Shuttle Columbia Recovery Effort was a unique incident from the perspective of the nature of the work and the diverse agencies involved, health and safety issues

varied little from those found on wildland fires. One IMT modified ICS form 215A (IAP Safety Analysis) for non-wildfire use, which provided an effective tool for identifying and mitigating safety issues.

However, this assignment also presented a number of unique challenges for the Safety Officers, requiring that personnel search hazardous areas by a variety of means, and mitigation methods were employed to minimize those exposures. Typically, dangerous situations were eliminated or the objectives were altered to avoid the risks to incident personnel. Specific examples of challenges and the mitigation measures taken include:

- Providing evacuation and sheltering of personnel in the event of severe weather events in the field and in camp. Detection, notification, proper actions and resumption of normal operations were covered in written severe weather procedures that were part of the Incident Action Plan (IAP.)
- Providing medical treatment for respiratory illnesses for a significant portion of the incident population. Having a clinic staffed by a professional health care practitioner significantly reduced treatment costs, lost time illnesses, and the number of follow-up visits.
- Gauging the effectiveness of PPE and flexibility in the application of alternatives. Most crews were not prepared for this non-traditional assignment. Wildland firefighting PPE did not adequately protect against the many and varied hazards. Snake chaps, rubber boots, mesh goggles and insect repellents were successfully used to provide protection from venomous snakes, biting insects and thorns and briars.
- Providing specific safety training for English and non-English speaking incident personnel. The use of bi-lingual translators and multi-language safety messages helped in the exchange of important safety related topics.
- Coordinating and establishing multi-agency/contractor accident and injury procedures and protocols in advance of the need. Most agency and contractor policies did not mesh well at the time of the injury or illness. Standard, incident specific protocols and procedures eliminated many misunderstandings and conflicts.
- The need to account for severe weather. Spring is tornado season in the south. One IMT responded to this hazard by revising an existing Severe Thunderstorm/Tornado Emergency Plan, and executing three live-action drills in the three weeks that the IMT was there. This IMT equated their drills to proficiency drills on Standards for Survival and fire shelter deployment.

**Lessons Learned:**

- ☀ ICS form 215A (IAP Safety Analysis) can be effectively modified to identify and mitigate safety issues on non-wildfire incidents.
- ☀ On multi-agency and multi-jurisdictional incidents, the safety functions of each agency need to work together. Communicate and support each other.
- ☀ Require that incident specific hazard mitigation plan be a part of the IAP. This plan would give specific directions on major hazards to personnel from natural or incident hazards (i.e. severe weather, flooding, fire, etc.)
- ☀ Establish professional health care and clinical hours at the base camps.
- ☀ Make agency/ NWCG bi-lingual safety related materials available, including six minutes for safety for non-English speaking crews.
- ☀ Establish incident specific accident and injury protocols and procedures for all incident personnel regardless of their individual employment status. Train and drill on the protocols.
- ☀ Ensure that the Medical Unit reviews all return-to-duty medical releases prior to redeployment of an individual to line assignments. Individuals have been cleared for duty by non-incident medical professionals but are unable to perform the assigned task at the health/ fitness levels required.

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**Planning for MEDEVAC**

**Background:** Three IMTs cited their medevac planning efforts as notable successes.

One IMT reported that steep terrain and lack of access required them to plan for military “dust-off” capability via the use of Military Assistance to Safety and Traffic (MAST). As it turns out, the capability was needed, and the IMT implemented a very safe and effective military “dust-off” operation that went according to the plan developed before the need. The plan enabled the timely extraction of an injured person from a challenging location.

Some basic information is required to make effective use of this emergency transportation system and the information must be gathered prior to its need. Information needs include latitude and longitude at the pickup site, refueling sites, and other standard information. It is important to recognize the lag time involved in this complicated mission, and the need to plan for and implement intermediate medical attention during the interim.

A second IMT also reported an air medevac, from the fireline, which they completed in a very efficient, professional manner. In this case, a Division Supervisor took control of the situation and the crews at the scene did a

commendable job of working as a team to move the patient to a constructed helispot. The IMT Air Operations Branch Director presented the team with several possibilities for action, and incident personnel were able to fly the patient off the hill before the end of the operational period. Like the other IMT, this team cites the value of planning ahead, and reports that it had included an Accident Communication Procedures and Guidelines page in the IAP that they believe was a factor in the successful evacuation.

Finally, another IMT reported that, because their incident was far from hospital services, they were dependent on helicopter medevac for all off-site emergency care. This IMT mentioned that, under these circumstances, locating their helibase close to camp helped with emergencies.

**Lessons Learned:**

- ☀ Develop a MEDEVAC plan ahead of the need.
- ☀ Include the medevac plan and accident communication procedures in the IAP and brief incident personnel on the plan and those procedures.
- ☀ Establish a team procedure for medevac, and assure that personnel responsible for implementing the procedure know their responsibilities.

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**Safety of Burned Area Emergency Rehabilitation (BAER) Team**

**Lesson Learned:** On one incident, the team managed the safety of BAER Team members by assigning the BAER Team to a Group Supervisor and by assigning fallers to the Group to survey the area for snags before the BAER Team entered.

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**Aviation Safety: Providing Training During the Incident**

**Lesson Learned:** On an incident, the Air Support Group conducted numerous airbase safety training programs during one week. The programs focused on aircraft rescue and fire fighting, risk management, and general aviation safety.

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**Work/Rest: Managing Guidelines and Handling Violations**

**Background:** Respondents report different approaches to managing the work/rest ratio. On one incident, crews and individuals were demobilized due to violations of team policies addressing appropriate behavior and work-to-rest guidelines. Personnel were well briefed on the team's policies, and violations were dealt with. This IMT believes this approach represents a good example of a way to manage for safety.

Another IMT reported continuing difficulty with personnel understanding and interpreting the 2:1 work/rest ratio policy. Much of their difficulty was mitigated

when their Finance Section began monitoring all personnel time for the incident and providing clarification to individuals as needed. If home units would provide training to all personnel, many of the oversights that occur would be prevented.

**Lessons Learned:**

- ☀ IMTs need to manage their safety function by establishing team policy, briefing incident personnel on the team's policy and enforcing the policy.
  
- ☀ IMTs can address work/rest ratio policy by having their Finance Section monitor all personnel time for the incident and provide clarification to individuals as needed.
  
- ☀ If home units would provide training to all personnel, many of the oversights that occur would be prevented.

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**Safety Lessons from Australian Assignments**

**Overview:** Many lessons were learned about how fires are managed and suppressed in Australia, including regarding approaches to firefighter safety. The following section addresses Australian approaches to fatigue management, safety officers, crew protection on engines, communications and radio traffic, and escape routes and safety zones.

The Australians Live Fatigue Management

**Background:** U.S. personnel found that the Australians live fatigue management. They work seven days on, followed by two days off. On occasion, Australian firefighters go a little longer than seven days before their days off. If Australian firefighters are working a night operational period, firefighters work five shifts on and then take two days off.

In Australia, Safety Officers are Not Out on the Line

**Background:** The Australians teach safety to all firefighters throughout their career, and they are taught that safety is their responsibility. Each person looks out for himself or herself. Supervisors also look out for their crew's safety, but there is not a Safety Officer around emphasizing the basics. There were no daily safety briefings on routine safety matters. The only safety issues discussed were those occurring at that time or significant to the area that firefighters were working in, making the briefing brief.

Australian Engines Have a Crew Protection Sprinkler and a Reserve of Water to Run It

**Background:** When firefighters are entrapped and/or burned-over, they turn the crew protection sprinkler system on, and it puts a water curtain over the vehicle cab. The fires in most areas have short residence time, so this works well.

Radio Communications Protocol

**Background:** U.S. personnel found Australian communications and radio traffic unusual in that the Australians talk back and forth using each other's first names. This worked for the Australians because they knew each other, but for visiting Americans it proved difficult. The U.S. firefighters would have to constantly refer to the IAP to match names to positions so they could figure out what was going on. Ultimately, each group of U.S. firefighters had an Australian assigned to them as a radio operator for the overhead and the U.S. firefighters communicated through them.

Lack of Safety Zones and Escape Routes

**Background:** The lack of safety zones and escape routes as U.S. firefighters know them caused U.S. firefighters concern at the beginning of the assignment until they understood how the fuels reacted and how the Australians used their vehicles. However, the U.S. team still functioned like a U.S. hotshot crew, assigning one or two people to look for safety areas ahead of their operation and in the general work area. The U.S. team also assigned someone to take the weather and report it on the radio every ½ hour to track trends and moved some individuals around as lookouts, which is not routinely done in Australia.

**Lessons Learned:**

- ☼ The Australian approach may provide a model to manage fatigue.
- ☼ The Australian approach to safety briefing may provide a model for improvement to the methods used in the U.S. Examine whether safety briefings should be addressing very routine safety matters, or should address only safety issues unique to that incident and operational period.
- ☼ Examine Australian crew protection sprinkler systems for use on U.S. engines, particularly in areas where people fight fire in flashy fuels.
- ☼ When language barriers or radio communication protocols interfere with timely and effective communication, assign a radio operator who transcends the language or protocol barriers and communicate through them.
- ☼ When assigned to foreign assistance missions, U.S. firefighters will confront approaches to firefighter safety that they may find unusual and difficult. Make sure you have full situation awareness before deciding whether the domestic approach is right or wrong, and adapt familiar procedures to the local environment as necessary.

## **Vehicle Accidents and Driver Safety**

**Background:** An IMT managing a fire found that driving and transportation issues presented a challenge, especially in light of the serious incidents that had occurred during the fire season. Narrow dirt roads; steep side slopes; mixed traffic including water tenders, buses, engines, private residents; and the concern of excessive speed by some drivers were all issues that the IMT had to deal with.

The IMT began an aggressive driver awareness and education program including printing an IMT Driving Policy in the IAP and providing briefing reminders to all IMT personnel daily. The IMT used a one-way traffic system on the worst roads, with road guards controlling the traffic flow. National Guard personnel staffing road closure points reminded each vehicle driver of safety requirements. The IMT also requested and received assistance from the county sheriff's department in the form of enforcement patrols on county roads, and the IMT immediately demobilized personnel ticketed for speeding or reckless driving. The IMT believes these actions all contributed to an absence of driving related accidents on this incident.

An IMT assigned to the Space Shuttle recovery effort reported that, with a enormous operational area, their drivers logged over 300,000 miles without any bus accidents and only one minor backing accident with a van, which the IMT felt was an incredible record.

**Lesson Learned:** IMTs can address safety challenges caused by driving and transportation issues with an aggressive driver awareness and education program coupled with an effective traffic management system that is enforced. National Guard personnel, county sheriff's officers and other cooperators can assist.

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## **Public Safety/Law Enforcement Liaison**

**Background/Lessons Learned:** One IMT modified the normal ICS organization this year to place security and all law enforcement functions under the Safety Officer, and added the position of Public Safety/Law Enforcement Liaison. This change continued to prove its value as the IMT had several interactions with the military, search and rescue organizations, the county sheriff's office, and other entities external to the ICP and camp that would not have been handled as effectively if attempted by the traditional Security Manager.

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## **Adjusting to Changing Conditions**

**Overview:** Several IMTs reported that some of their best successes came from their ability and willingness to adjust strategy and tactics to reflect changing conditions. Some IMTs found that by altering their strategy and tactics expose fewer firefighters to risk during challenging conditions, they also achieved the side benefit of reducing suppression costs and resource impacts. The section below demonstrates examples of adjusting to extreme fire behavior, managing safety when conditions changed suddenly and achieving safety benefits by going indirect.

### Adjusting to Extreme Fire Behavior

**Background:** An IMT reported that when their fire made a 200 acre run, the crews and engines assigned to the fire maintained their calm, remained patient with a lack of effective communication, did exactly what was asked of them, and worked hard to suppress the fire, even though the incident lacked resources.

Another IMT reported their need to adjust to extreme fire behavior presented a challenge. A situation in which five large fire whirls were going in opposite directions at the same time gave an indication of the fire behavior with which they were dealing. Consequently, the IMT conducted all its burn out operations around structures and lines with a formal briefing and input from the Fire Behavior Analyst.

**Lessons Learned:** When fires exhibit extreme fire behavior, personnel need to remain calm, think clearly, act decisively, do what was asked of them, and continue to work to suppress the fire.

When faced with extreme fire behavior, adjust operations and briefing procedures accordingly. Involve the fire behavior analyst directly in operational planning.

### Managing Safety When Weather Conditions Changed Suddenly

**Background:** One fire was running and spotting prior to the IMT taking over. Resistance to control was very high with heavy fuels in fuel models 8 and 10 with a large dead component, and a large number of crews and equipment were ordered to manage the fire. The IMT took over command at 1800, with a small night shift and a plan in place for a large operation during the following day operational period. During the night, a rainstorm moved in and settled over the fire. In the morning it was still raining hard, and the ICP was just being set up. Rather than briefing crews at 0600 as planned and putting them out in the rain, the team's Command and General Staff met and decided to delay the briefing until 0800, giving the Operations Section time to revise the plan for the day operational period.

By 0800 the IMT decided to keep six crews and demobilize 16 crews, including some that had arrived overnight and others that were still enroute. The Planning and Finance Sections worked closely to facilitate simultaneous check-in and demobilization for resources surplus to the incident's needs. By early afternoon, all surplus resources had been demobilized without any problems. In addition, the IMT decided to hold the remaining resources in camp until the overhead could assess the fire area. The rain had stopped by noon, and all remaining resources were engaged by early afternoon. The actions of the IMT minimized the exposure of fireline resources to adverse weather and associated hazards, gave the Operations Section time to adjust the operation to the changed conditions, and permitted orderly demobilization of excess resources. The team felt that personnel safety and health provided the driving force behind all decisions made.

**Lessons Learned:** IMTs must be prepared to adjust quickly when weather conditions change dramatically. Personnel safety and health, including minimizing exposure of fireline personnel to adverse weather and associated hazards, should provide the driving factor behind the decisions of the IMT.

Simultaneous check-in and demobilization can prove effective when resources are still arriving that are surplus to the incident's needs.

#### Improving Safety and Reducing Costs by Going Indirect

**Background:** An IMT assured that safety was not compromised for its resources, when the IC and Operations Section Chief immediately realized the need to take the fireline indirect to ridge tops and roads and give up large acreage to provide for the safety to the firefighters. The fire was still contained quickly, safely and at a cost savings.

On another incident, an IMT found success with less aggressive suppression tactics that reduced overall costs and reduced risk to firefighters. Rather than aggressively constructing line through rugged inaccessible country, they used existing trails and natural barriers. Though more acres were burned, largely due to burnout operations, most of the burning provided a resource benefit. The IMT placed firefighters at less risk by reducing aircraft shuttles and by reducing the need to place firefighters in areas lacking safety zones, or having steep, dangerous terrain.

**Lesson Learned:** In some cases, going indirect represents the safest strategy and the best option for minimizing firefighters' exposure to risk. Additional benefits may include allowing fire to spread into areas in which it will provide a resource benefit, decreasing containment time and reducing fire suppression costs.

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## **The Safety Value of a Good Briefing**

**Background:** One area command team found that their “in-briefing” provided a good overview of strategic, logistical and political issues. The team also found that the briefing also stated that the primary objective was to provide for the highest level of firefighter, public and aviation safety. The Incident Management Team (IMT) implemented the stated objective by stressing the Standard Fire Orders, Watch Out Situations, and utilizing the ICS 215A process.

On a separate incident, an IMT reported that their command transition with another IMT was essentially seamless thanks to an outstanding "in-briefing" by the outgoing team's Safety Officer Trainee. They also report that their briefings from the agency administrator provided their Safety Officer with excellent information, which aided in the risk mitigation process. This briefing was effectively backed up with additional information provided by a local person assigned by the agency administrator.

Another IMT reported that for non-wildfire and non-traditional assignments (such as the Space Shuttle recovery), all resources reporting to the incident were provided with a comprehensive orientation including information on physical requirements of the assignment, tactical approach, and sensitivities.

**Lessons Learned:** A good briefing that makes objectives clear and focuses on risk management can help provide for the highest level of firefighter, public and aviation safety.

The agency administrator's briefing provides the Safety Officer with important information that aids in the risk mitigation process and sets the tone for operational safety. This briefing can be effectively backed up with additional information provided by a local resource assigned by the agency administrator.

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## **Contract Engines/Engine Boss Qualifications**

**Background:** One area command team reports a concern that came up during their in-briefing, that of contract engines. Specifically, in the briefing, it was stated that the Region did not require a fully qualified Engine Boss on contract engines, and they would allow trainees to operate them until 2004 when full compliance with “Standards for Fire and Aviation Operations 2003” (former BLM Redbook) would be achieved. The situation was discussed at length after the official meeting with the Area Command staff. It was felt that this requirement would limit their effectiveness and require additional overhead to ensure safe operations. This situation was resolved about half way through the incident when Area Command clarified the situation by stating that fully qualified Engine Bosses would be supervising the trainees operating the contract engines.

The geographic area policy of allowing unqualified contract engine staffing was raised as a significant safety issue by all out-of-area IMTs and was consistently addressed at all close-outs and in all final narrative reports. The involved teams recommend that when there are localized policies, especially those contrary to national standards, that these localized differences be identified at the IMT in-briefs either in the delegation of authority or the briefing package.

**Lessons Learned:** IMTs will encounter situations where jurisdictions have modified their qualification and certification systems to allow personnel on the fireline that do not meet NWCG 310-1 standards. IMTs must be prepared to address this situation in their policies, procedures and planning.

**Recommendation:** The NWCG agencies need to find a single, comprehensive strategy for managing the qualifications of contracted resources

**Note:** This issue is also discussed in the Operations Function section of this report under the heading Dealing With A Host Specific Qualifications System (Page 55.)

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### **Incident Management Team Response to a Serious Safety Concern**

**Background:** An IMT working on a complex of fires reported that two agencies learned a valuable lesson in safety, and the IMT learned that not all areas run fires as they do in their home states. When the IMT arrived, the two agencies were running their respective fires on adjacent Indian reservations independent of each other. However, one fire was on both reservations, and the agencies were running this incident with two different Incident Commanders (IC), and two different radio communication frequencies. Individuals had been working on this incident for over 24 hours and working in positions beyond their red card rating. The situation represented a major safety problem and an accident waiting to happen.

**Lessons Learned:** IMTs need to be ready to react to safety concerns immediately, even if the incident has not yet been turned over to the IMT. Political differences need to be put aside when safety is the issue, and a team needs to be ready to correct a situation and worry about mending fences after the safety issues have been resolved.

Be prepared to offer recommendations to improve the working relationship between host agencies.

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### **Providing Fire Shelter Training at the Incident**

**Background:** One IMT reported that they used Safety Officers to provide fire shelter training to personnel arriving on the incident such as drivers, media, etc., who had not had the training. Another IMT reports that they resolved this challenge by having the host agencies provide a person to the ICP to provide Standards for Survival training to drivers and other miscellaneous resources.

**Lesson Learned:** Safety Officers and host agency personnel can provide fire shelter training to personnel arriving on the incident who have not had the training, such as drivers, the media, etc.

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### **Dealing With Ammunition Caches And Marijuana Plantations**

**Background:** One IMT was challenged by dealing with ammunition caches and marijuana plantations both inside the fire area and outside the fire line. Firefighter safety issues relating to ammunition caches and marijuana plantations became the immediate issue for the IMT. Armed, line qualified Law Enforcement Officers (LEO) were ordered for the incident. LEOs were assigned to the divisions to be with the firefighters when these items were located. The FBI and ATF were brought in as well.

**Lessons Learned:** When drug plantations, ammunition caches and other illegal activities exist within and adjacent to the fire area, order line qualified, armed Law Enforcement Officers and assign them to the fireline to escort and assist operations personnel.

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### **Mitigating the Effect of Extreme Conditions on Firefighters**

**Background/Lesson Learned:** An IMT faced extremely rough conditions that tested the physical condition of many crews. The IMT was also providing support for three initial/extended attack incidents. The team established a rotation schedule to bring crews down from the mountain spike camp. While in their rest rotation away from spike camp, crews augmented initial attack support resources.

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### **Planning and Managing Radio Communications**

**Background:** According to one IMT, communications presented a significant challenge for the first two days of their incident assignment. The first day, all operations on the forest (two complexes and an array of initial attack fires) were on the same command and tactical frequencies, and the situation presented a major safety issue that needed quick resolution. The IMT had ordered a radio kit, but it did not show up for several days. They were able to get four tactical frequencies established and put them into place for the second operational period, alleviating the issue on the tactical side. However, problems continued

on the command frequency. Fortunately, the incident received its own command frequency by the third operational period.

**Lessons Learned:** Frequency sharing can quickly lead to communication system overload and unacceptable compromises to firefighter safety. When radio kits are not available to alleviate communication frequency sharing and system overload, Incident Management Teams need to resolve communication problems quickly. Working with their host agencies and the host agencies' cooperators to make additional frequencies available and re-route communications traffic may be a solution.

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### **Using Field Reconnaissance to Overcome Safety Challenges**

**Background:** An IMT reported that they used field reconnaissance as a strategy to overcome numerous safety challenges. The incident included several divisions with critical safety concerns, including steep slopes, explosive fire potential and a lack of escape routes and safety zones. A strong inversion and the unavailability of Type 1 crews initially delayed control efforts in these more difficult divisions. The inversion severely limited aviation operations, increasing the risks and hazards for line personnel. Neither Air Attack nor the Helicopter Coordinator could provide "eyes in the sky" for the ground resources because aircraft were unavailable to support burnout operations.

The IMT undertook several days of on-the-ground reconnaissance, allowing the team time to formulate effective tactical plans that were implemented once adequate resources arrived and the inversion lifted. The IMT Operations Section performed detailed reconnaissance and constructed escape routes to safety zones. The IMT also used the ICS 215A process to help mitigate the hazards they faced. When the inversion lifted, aviation resources could provide "eyes in the sky." The aviation support, combined with the other mitigations, allowed the IMT to provide for firefighter safety.

**Lessons Learned:** Suspend, delay or reduce operations in dangerous locations and take proactive measures to gain full situation awareness and mitigate critical safety concerns in those locations. Performing extensive reconnaissance represents a key step in this strategy when faced with steep slopes, explosive fire potential, lack of escape routes and safety zones, inadequate resources of the appropriate type and other significant hazards.

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### **Mitigating Grizzly Bear Hazards**

**Background:** An IMT reported that an incident they managed was their first exposure to the Grizzly Bear hazard. Because the Grizzly Bear is listed as a threatened species, special protections and precautions are required, and the host agencies were very serious and strict about bear management practices in the fire area. The host agencies supplied qualified personnel to discuss proper food storage techniques and bear avoidance tactics at all morning briefings. In

addition, they provided specialized training in pepper spray defense to IMT personnel that typically work alone on the fireline. After this initial training, the Section Chiefs or Safety Officer trained new resources arriving on the incident. There was a continual bear presence around the camp, necessitating a live trap in camp. Two black bears were trapped in the immediate vicinity of the camp. The IMT Logistics Section did an outstanding job in operating and maintaining a clean camp, which prevented bears from securing non-native food.

**Lessons Learned:** Grizzly Bears in the fire area are a serious safety matter. Operating and maintaining a clean camp and training personnel in proper food storage, bear avoidance, self-protection and other bear management practices will represent a priority for an IMT managing a fire in Grizzly Bear habitat.

When incident specific safety or resource management hazards are present on your incident, take advantage of host agency personnel and other local experts to advise the team and train incident personnel.

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## **LESSONS LEARNED RELATED TO THE TRAINING FUNCTION**

### **Orientation and Safety Training for All Incoming Field Personnel**

**Background:** During the Space Shuttle Columbia Recovery Effort, an Incident Management Team (IMT) combined orientation and safety training for all incoming field personnel and conducted a shadow day for overhead to provide for effective management of the recurring rotation of incident personnel. The IMT noted that the non-wildland fire agencies needed more training on the ICS under NIIMS.

**Lessons Learned:** Diverse agencies that have not worked together before need to conduct both an orientation and safety training for all incoming field personnel, and a shadow day for overhead. This is particularly true when the IMT is managing recurring rotation of incident personnel. When circumstances allow, orientation and safety training can be combined.

Non-wildland fire agencies such as the Federal Emergency Management Agency, National Aeronautic and Space Administration, Environmental Protection need more training on the ICS under NIIMS.

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