

## **Findings of the Wildland Fire Safety Conference 6-8 November, 2001**

Participants in the Wildland Fire Safety Conference met in “breakout” or work sessions on November 6th, 7th and 8<sup>th</sup> 2001 to conduct facilitated, in-depth discussions. Brief panel discussions preceded each breakout session to recap the day’s presentations and initiate conversation.

Each day, the work sessions addressed four themes, including: Health and Fitness in the Firefighter Workforce, Safety in the Interface for Firefighters and Homeowners, Making Safer Firefighters and Safety on the Fireline.

### **Broad themes emerged, including:**

- The need for follow-up action by agencies to define their organizational values and enable values-driven organizations. Questions remain about how agencies might implement this concept and come to this point.
- The need for follow-up action to review the content and organization of the 10 Standard Fire Orders enabling firefighters to effectively employ the fire orders as rules of engagement and disengagement vs. generic “we don’t bend them/we don’t break them” guidance
- A call to incorporate what was heard at this conference into leadership training, to have the NWCG develop a nationally standardized leadership training curriculum and shift many of the ideas that were heard at this conference onto the fireline
- A loud call to “stop talking about mentorship” and start doing it (beginning with new firefighters and continuing upward throughout agencies)
- A message to the NWCG that the fire community strongly desires to have protocol for turning down fireline assignments indoctrinated in a positive light (standardized, indoctrinated, defined and tightened-up)
- A call to have Incident Management Teams (IMT) take-on the responsibility for posting SAFENET information
- The need to have the NWCG more clearly define SAFENET, market its use and assure that it is implemented in the field
- A clear call to hold people accountable for their actions and to institutionalize accountability including implementation
- A strong statement that health and fitness are critically important to fireline safety and a top priority at all levels of fire management organizations. Attention to health and fitness should be automatic, not questioned or on the fringe

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### **Broad themes - continued**

- A desire to research what agencies reward and award (as well as SOPs and policy) to determine which are at cross-purposes to safety
- A call for funding and research that allows us to make policy decisions based on sound research (work/rest ratios and assignment duration for example)
- The need for integrated training among State/Provincial, Federal, local and private resources
- The need for an integrated, systematic training system (Fireline Leadership cited as an example)
- Continual references to the risk management process and its importance
- Recognition that personnel must take personal responsibility for their own health and welfare (nutrition, sleep, rest and recuperation, etc)
- A need to define outcomes/performance outcomes
- A realization that personnel who have been identified as having leadership potential need to have some personal control over how quickly they move toward that potential

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### **Broad themes – continued**

- Confusion over who (NWCG, Federal Fire and Aviation Leadership Council, Federal Fire and Aviation Safety Team, etc) is in charge

### ***Key Observations and Recommendation: Staying Safe on the Fireline***

Information from the field indicates that we are seeing indicators of real commitment to safety, that opportunities for change appear to rise from the ground level and that the desire to spawn action is high. Participants generally agreed to the need to move forward with continuing improvement in the areas of interpersonal communications, investigations and reports as learning tools and risk recognition.

The firefighter/fire management culture must adapt and/or change so that real change in tactics, training, etc. may occur. There may be a need to develop a more full-time fire organization, for sufficient knowledge and experience, situational awareness skills and overall safety consciousness to develop, and to provide adequate options to get the training and experience necessary to do the job right.

The Thirty Mile incident was not a surprise because basic problems still exist. The entire fire community must embrace the concepts of human factors, human vitality and human interaction in fire training and operational performance.

Safety and firefighter safety issues and concerns including PPE are global and information is widely available. However, we seem to lack mechanisms for communicating and sharing the information.

Leadership is an issue. Leaders need to be teachers. Leaders need to be able to communicate. Leaders must possess experience. Leaders must mentor less-experienced personnel.

The fire community needs to embrace the “lessons learned” concept to facilitate creation of a new, desired culture. Lessons learned are most valuable when information is disseminated in real-time or near real-time. Lessons Learned must include positive examples from successful operations.

The concepts of “risk management” and “situation awareness” must be institutionalized legitimized, implemented and made a part of a mentoring process and training curriculum.

Fire management agencies must make use of formalized mentoring processes to close the growing experience gap.

There exists a need to legitimize and institutionalize processes for disengagement from a fire, allowing personnel to abort fire operations when conditions are deemed too risky or when resources cannot be obtained to allow for aggressive, effective action. Institutionalize the concept of establishing decision-making and disengagement “trigger points.”

The National Wildfire Coordinating Group (NWCG) Position Task Book system is promoting undesired consequences, fostering a “ticket punching” and fast tracking environment, and does not provide a valid substitute for experience – go back to what worked. (USA)

Participants value the intent behind the SAFENET system, but have concerns including the need for national, top-down advocacy for SAFENET, and issues of SAFENET timeliness (information must be disseminated quickly/immediately to be of value,)

There exists a need to overcome a “zero defect” mentality by Incident Management Teams, creating a climate in which incident organizations are more accepting of information from

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SAFENETS, encouraging Incident Management Teams to use SAFENET to address safety issues at briefings (following mitigation,) the need to post SAFENET information as it moves up through and organization and the need to have each SAFENET reviewed by qualified Safety Officers. (USA)

We talk about anchor points, but continue to engage fires without anchoring.

Radio communication efficiency presents a serious problem - clear, concise radio communications are required, need to get back to doing it right.

The issue regarding seatbelts in all forms of crew transportation needs addressed nationally (USA.)

The National Wildfire Coordinating Group (NWCG) Fireline Handbook requires content review and content changes, including first aid standards and Type II crew standards. (USA)

Questions over whether we need a better fire shelter or a better approach to entrapment avoidance (USA)

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### ***Key Observations and Recommendations: Making Firefighters Safer***

#### **Assignment Turn-Down Concept**

Participants generally agreed that they like the assignment “turn down” concept, yet have concerns over its implementation. Is the proposed process too formal? Ensure that implementation of the turn down concept is not seen as a disciplinary action.

#### **Five-Step Risk Management Process**

Participants agree that wildland fire agencies should continue to support, implement and employ the five-step risk management process. However, concerns over the process remain, including:

- Concerns over the detail within the process
- A perceived need to streamline the process to facilitate delivery
- The need to incorporate the risk management process into all levels of training
- The need for clear policy direction on the five-step process, its implementation and training for its use
- Ensuring performance based outcomes from risk management process training

#### **SAFENET**

Participants noted a need to clarify SAFENET program terms of reference and market the program again. Participants also noted that the potential value of SAFENET is to incorporate lessons learned into training, a formalized lessons learned program and safety alerts.

#### **Incident Based Medical Care**

Participants generally agreed that we are obligated as leaders to provide first-rate medical care on incidents, and that incident provided medical care represents a priority for resolution.

- A desire for common interstate EMT standards and established standards for medical staffing (based on fire organization size)

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### **Training**

Participants generally agreed on the following training principles:

- Get back to practical, hands-on field training
- Train holistically (whole person) and comprehensively, not just single skills
- Teach new firefighters good habits immediately so they can develop and carry them throughout their career
- Insure that training is institutionalized for all, including structure firefighters
- Training doesn't stop in the classroom. It should be carried out daily in the field
- Focus training initiatives on areas where we have performed poorly traditionally
- Structure protection training should emphasize flexibility of tactics in varying fuel models/geographic regions
- Raise the bar on experience vs. training (emphasis on experience)
- Standardize curriculums
  - Recognizing not everyone is suitable
  - Define values and address in every course
  - Demonstrated need for practicing mindfulness
- If an experienced retiree is brought in, assign a trainee to them for the duration of their employment to gain maximum benefit from their presence

### ***Leadership Training***

- Leadership courses must include the concepts of risk management and trigger points
- Keep fireline leadership training external (re. upcoming hand-off coming so agencies can develop their own leaders)
- More mentoring on the line
- More apprenticeship
- Resurrect core competencies

### **Culture/System**

- Need to adjust the firefighter culture and hold people accountable at all levels, politically, at the agency management level and supervisory levels as well as crewmembers
- Enable personnel to resolve safety issues on the spot Homeowners must be held accountable for their homes. Firefighters should no longer jeopardize themselves for houses – this issue must be taken up as a public/political educational project.
- Need to bring firefighter and management missions into alignment to accomplish buy-in and accountability

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- Involve managers/line officers in cultural change as soon as possible but keep pushing from the ground up

### **Aggressiveness**

- What are our core values?
- Fireline actions don't match directives well
- Train people to think, conduct on-the-job training (OJT) and conduct after action reviews (AAR)
- Stop protocol to evaluate current situation
- Find external experts in areas outside our expertise

### **Fire Orders**

Examine the feasibility of revising the "10 standard orders" (per Putnam)

### **Philosophy and Management**

- Be mindful!
- Fight fire with intelligence!
- Address and balance rewards vs. risks!

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### ***Key Observations and Recommendations: Safety in the Interface for Firefighters and Homeowners***

#### **Evaluating Risk and Benefit**

There was general affirmation that the presence of private property or structures should not cause us to put firefighters at risk

Recognition that at least 23 systems exist for evaluating interface development and that standardization and unity are desired

#### **Decreasing Firefighter Exposure**

Participants generally agreed on the need to decrease firefighter exposure in the WUI and on WUI incidents. Participants discussed concepts for decreasing firefighter exposure which they believed to have merit, including:

- Expanding the use of firefighting foams and gels to enable firefighters to prep structures and then exit the area prior to passage of the fire front
- Pre-planning for firefighter hazards within WUI zones
- Integrating tactical training between wildland fire agencies, fire departments and contractors who will be working together
- A perception that it is necessary for agency personnel to train for the “all risk” mission
- Broadening involvement with property owners, including homeowner training accomplished with individual owners, through homeowners’ associations and/or via demonstration projects
  - Identify limits of what agencies can do and what homeowners must do
  - Let public know that we will not endanger firefighters to protect homes
  - Push the FIREWISE concept
- Placing firefighters between homes and the fire only when risks have been evaluated and managed (“when we can win”)

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### **Leadership**

The participants discussing safety in the interface noted (as did other participants in other sessions) that leadership is an issue and noted the importance of leadership training. There was general consensus that the existing efforts at fireline leadership training may need to expand beyond the current weeklong format and that this training must be integrated into the training curriculum and spread to all agencies. Some noted a need for a systematic approach to providing this training and agreement on how who is responsible for distributing this training to all agencies.

### **Sheltering In-Place**

As with previous Safety Summits hosted by the International Association of Wildland Fire, participants showed a keen interest in the concept of “sheltering in place” (vs. evacuation.) This concept remains controversial outside of Australia, but general agreement emerged that sheltering in place represents a safe strategy when combined with other actions taken prior to and during the fire.

### **Integrated Approach**

Participants engaged in considerable discussion regarding the need for an integrated approach by structure fire and wildland fire agencies when addressing fire in the WUI. Points of agreement include:

- The need for local, volunteer fire departments to be involved in the protection of private property and the need to foster effective working relationships between wildland fire agencies and fire departments through effective and consistent use of unified command
- The need to broaden the role of local fire departments beyond fire response, using their expertise, local knowledge and community relationships to foster fuel reduction efforts in their communities
- Involving local law enforcement agencies in planning, including preparation of a “protective action packet” containing roles, responsibilities and instructions for sheltering in-place, when it is safe to stay, evacuation and seeking refuge
- That physical fitness is an issue for local fire departments and that any fire department expected to respond to fires in the WUI should be required to pass fitness test. Doing so would benefit the department, its members and the community they protect not only for wildland fire responsibilities
- Standard training must be accessible to local government agencies and contractors, all resources must train to same standards, local government fire departments and contractors must be included in training plans and resources should train and practice together
- A call for standardized structure protection specialist qualifications

### **Enlist Developers, Local Government and the Insurance Industry**

Participants also discussed the need to enlist developers and local government into a unified and integrated approach to managing development within the interface. Principal points of discussion receiving broad agreement included:

- A desire to influence/change the interface fire situation at the lowest level of government, including homeowners associations and county government
- The need to encourage or require developers to consider fire protection in the design and development process, to develop with adequate setbacks from wildland fuels and to complete or share in the work and costs associated with separating residential development from

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wildland fuels. Some participants expressed a need to work with developers at the grass-roots level regarding structure ignitability including providing incentives to build in a fire safe manner

- Potential exists to use tax incentives, such as providing property tax reduction in exchange for hazard reduction
- The need to work with county government to encourage/enable them to adopt requirements for effective development regulations and plat review – need to educate the political entities and get the media on-board
- The need to evaluate (rate) interface hazards on a parcel by parcel basis, develop subdivision fire mitigation plans and stimulate action
- General agreement that wildfire hazards should be treated like flood hazards and that wildfire-prone areas should be treated like flood plains, establishing that some areas are unsuitable for development due to unacceptable exposure to a natural hazard (fire) – a place to involve the insurance industry

### ***Key Observations and Recommendations: Health and Fitness in the Firefighter Workforce***

There was discussion and comparison in fitness training and testing for fire positions from an international perspective including Australia, Canada and the United States. Federal and contract or private perspectives were included.

#### **Fitness**

Fitness routine and nutrition fall apart during times of greatest stress (fire season)  
Making it important to develop and maintain good habits in the off-season

Fitness standards – does one size fit all? Gender & age have not been a problem for achieving required fitness levels. When personnel cannot meet standards, they are able to move into other functions/positions.

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Where there are mandated physical fitness requirements for some positions – personnel can train specifically for position or work related training. Alternatively, the employing agency can provide opportunities for fitness training to reach goal, (either personal goal or professionally required.) In most (US) agencies, employees maintaining fireline position qualifications are required to pass a fitness test (work capacity test.)

United States Forest Service (USFS): Fitness opportunities are available via a “wellness program,” Other regions have adopted the Northern Rockies (R-1) wellness program format, providing wellness screening and matching time for fitness activity or funding for health club use. However, not many employees take advantage of the offered program. 10% of employees would exercise even if it was forbidden. 10% won’t exercise no matter what incentive is offered. The USFS program is aimed at the middle 80% who can be influenced to adopt a healthier lifestyle at some point in their career. Unit can provide their own fitness site for their personnel, but this needs to be monitored for correct use. Family use becomes a temptation and presents liability concerns.

Many limits are placed on some activities that are accepted as part of fitness training – injuries most common in some sports like basketball, and free weights without prior training. Some limitations seemed common across agencies and countries.

Age and fitness: Approaching retirement will reduce numbers of skilled fire personnel. Many “older” fire personnel are actually in the best physical condition. There are concerns that younger personnel coming in will not meet fitness needs. Many of our safety and fitness standards don’t make sense to the younger work force.

Mandatory fitness programs: Some Hotshots (US) requires physical training (PT) programs and levels of achievement. The USFS’s Partnership Council (union) has discussed mandated fitness levels.

Barriers to widespread mandated fitness levels: original position description – fitness requirements are rarely clear. Also have “duty to accommodate” special needs. Employees must be given time to reach a level of fitness if a new level is mandated.

Or use “practical” fire training if they are resistant, that is put them to work at the task they will have to do, for example, hauling gear a certain distance.

Are we training to the needs of the firefighting positions? What are the needs?

Aerobic fitness – yes by all countries and agencies in discussion group. Ability to do repetitive tasks and skill to do that task, such as working with a specific tool.

Strength training? Agility? Balance? Mental fitness – team building, stress release through team games.

### **Physical Fitness Tests**

Australia: Pack hike plus medical screen – no problem for operational folks (less than 1% failure)

Tasmania, Australia: 2 to 3 mile (seasonal) pack-hike test each year plus medical screen. Walk test. Lifting test may discriminate if set at one set weight and may not be a fair way to judge ability and fitness for fire duty.

United States: Work capacity, upper body strength, aerobic ability. Age/skill deficit - age not a problem as fitness is a fixable problem. Finding positions for younger personnel who are unfit is a problem

Canada: Use of interagency, international crews will be necessary to reach adequate staffing on fires.

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Solutions: Passing fitness tests boosts individual morale. Supervisors passing same fitness requirements as crews boost overall morale.

Cardiovascular fitness: Will there be guidelines for coming into season? Progressing through season? MTDC has put out general guidelines in the past. Does field want an exact program, like athletes use now in training? Or is it better to use the "practical" skills type of training. Work in project work to use the types of skills, muscle groups actually needed for fire. May need to be set up by type.

### **Food and Nutrition**

Nutritional research regarding Type 2 crews has not been done. Type 2 crews may need extra nutrition, but researchers do not have the necessary energy expenditure information as of yet.

Best recovery occurs with 1g/kg body weight of immediate carbohydrates intake. Liquids represent the fastest way to get these carbohydrates. Gatorade and Powerade are good sources as are fruit juice and fruit. Caffeine may cause hydration problems. Otherwise candy bars and soda are OK. Can documentation on carbohydrates be provided? Need to provide supplemental carbohydrates at all cost, but provide a variety. Is carbonation a hydration problem? MTDC: No.

Can the needs of firefighter be listed in the fireline handbook or in a "tech tip" from MTDC on hydration and supplement needs? Would help if recommended by safety and health working team.

Meals provided by caterer are 40-50% fat. That is OK if carbohydrates are available as well. Caterers need more guidelines. There is a meeting yearly with them. There have been changes since mid 80's and those have not been difficult.

Contracting officer is dedicated to proper nutrition. A strong relationship exists between a good caterer and healthy fire camp.

Mineral supplements and antioxidants have become more available in camp. MTDC has explored including them in energy bars as the military does. But supplements are in a secondary position now. Literature is not clear on benefits. Watch military use for information on benefits. MTDC has not yet had time to test.

Make a recommendation to National Contracting Officer Meeting upcoming contract update at San Diego meeting in February. Jan McClusky is person to contact with information. MTDC could supply specifications. The group is very willing to work as needed to improve specs.

Registered dietitian may not be able to give adequate specifications. Need sports nutrition expert to input. Food unit leader works from specs, contractor will meet minimum.

MRE's get thrown away. Catering camps have been used, but with varied success.

### **Fatigue, Sleep and Shift and Assignment Duration**

Sleep. Adequate rest is not always happening. Enforcing policy is difficult, especially in initial and extended attack. Personal accountability is critical here. When there is an accident, one of the first questions is when was last rest?

Comment on 21 hr shift (Dr. Ruby presentation) work shift long but arduous only for about 8 hours. Extended day had strong effect on analysis.

Dome fire. Tried to catch crew after 2 days off to see if full recovery. But this was an early fire. What are additive effects of a long season? Needs testing.

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The policy decision reducing assignment duration from 21 days to 14 was made to address a TriData study finding indicating increased accidents after 14 days. Decision was based on limited study.

### **Personal Accountability for Rest and Nutrition**

Value-driven vs. greed-driven. If value driven, accountability takes care of itself. Fireline leadership training provides the personal skills needed. Management decisions also drive long days to achieve fiscal benefits. It costs less to bring in a single crew for 16 hour days than to mobilize several crews for fewer hours per day.

In Alberta, 16 hrs per day for first 3 days if the fire is out of control, then cut to 12 per day. If fire is under control, then right to 12 hours. Poor decisions, accidents increase with prolonged days. Productivity decreases. Get cooperation in resources so crews stay adequately rested. Huge liability issue if keep pushing crews. There is industry data to back up the need for limited hours to keep peak productivity.

Alberta tested: In first 24 hours of initial attack, can work 24 hours, if justified, but then must have 8 hours sleep, without travel or other disruption. Favorable response.

Portal to portal pay may change some of the \$\$ motivation. A bill is introduced to congress this year.

Do we value containment and control and money over safety? Perhaps not completely - achievement also a driver.

There is a lot of science explaining healthy and safe work environments.

Lack of resources may keep crews working longer in years like 2000.

If we have hard and fast rules on work time, we prevent that personal decision from having to be made.

Supervisor should know crew work/rest history and be accountable for decision to work or rest. The supervisor should know physiological limits.

How do you know if crew can manage next assignment or next shift when you cannot predict what that assignment will bring?

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### **Issues and Concerns:**

- A need for nutrition guidelines and standards that are passed to the caterers or contractors so that adequate (and appetizing) carbohydrates are available.
- A request for guidelines and availability of nutritional supplements such as minerals and antioxidants.
- A concern that human nature to maximize work/reward relationship is driving work/rest cycles while research is indicating a need for more rest. A request for shift length/assignment length guidelines for optimal health and productivity.
- Need to promote fitness. Paid PT for arduous firefighters and wellness for agency in general. Need guidelines.

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### **Recommendations:**

1. Recommendation for MTDC to attend the National Contracting Officer Meeting and supply nutritional guidelines for upcoming contract update at San Diego meeting in February.
2. Recommendation to Safety and Health Working Team for MTDC to produce tech tip on nutritional requirements plus ideas for supplemental foods.
3. Recommendation to Safety and Health Working Team for MTDC to produce fitness training guidelines for off-season training, training in preparation for upcoming season, training needed to maintain fitness through fire season.
4. Recommendation for MTDC to specify optimum shift length/ assignment length based on science. Could establish formula based on crew type, fitness level.
5. MTDC needs funding for research, and assignment of priorities.
6. Upper limits recommendation...MTDC will follow literature in this regard. INFO: no risk (except wt gain) of excess intake on macronutrients. Micronutrient intake will be adequate with a varied diet. Easy to assess at rest, more difficult to assess when need 6000 cal.
7. Also, recommendation to safety and health working team for MTDC to produce tech tip on nutritional requirements plus ideas for supplemental foods.
8. Recommendation for fitness training guidelines. MTDC needs this listed as a priority...would need to come from Safety and Health
9. MTDC could specify, based on science, optimum shift length. Could establish formula based on crew type, fitness level. Need funding for research. Industrial data might not apply. Military data may be more applicable.
10. Recommend from this association, that the safety and health working team provide direction to MTDC to continue research on shift length/ assignment length as it relates to firefighter safety.
11. MTDC reminds us that funding is needed so priorities need to be established and given back to MTDC.
12. Need to promote fitness. Paid PT for arduous firefighters and wellness for agency in general. Need guidelines.