

**IAWF's Eighth Wildland Fire Safety Summit;  
The Human Factors Workshop – 10 Years Later, University of Montana,  
April 26-28, 2005**

**Conference Summary**

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Even though I'm a long time member of the International Association of Wildland Fire (IAWF), I'd like to take this opportunity to thank Dick Mangan (USFS [US Forest Service], retired) the IAWF's current President for moving this topic forward through the IAWF's Board of Directors so this event could take place. To Dr. Bret Butler (USFS) and Wayne Cook (USFS) who have worked tirelessly behind the scenes as did the rest of the planning committee. Only until you have been on one of these conference planning committees, and that's a hint, do you really realize how much effort goes into the successful pulling off of an event like this. These events are long-term incident management experiences. I would also like to extend my thanks to the many volunteers who made this IAWF Safety Summit™ run as smoothly as it did, many from the US Forest Service's Rocky Mountain Research Station and the Montana Department of Natural Resources and Conservation. It's to their credit that when minor hiccups did occur most of you never even noticed. That's the way it's supposed to happen.

I was asked to substitute for Dr. Karl Weick and it is impossible for me to provide you with a summary such as he might have produced on this conference. "human factors" is not my area of expertise, I'm more of a "natural science" type of guy and maybe that's why this morning when I heard about confirmed sightings and a year of secretive study in the cypress swamps of Arkansas confirming the existence of the long thought to be extinct Ivory Billed Woodpecker I was excited and astounded. I'm a true novice when it comes to recognizing "human factor" considerations, other than the fact that I have had to manage my own organization and keep my employees safe –a primary concern, and I have always emphasized the fact that I wanted to encourage truthful communications within our small group. We always emphasized and practiced many of the communication and learning concepts expressed in this conference within our "tail-gate" sessions and end-of-day, or end-of-action debriefings. Maybe I had a basic concept of "human factors" all along without realizing it; but there evidently is so much more to learn and so much more to achieve. Truthfully, on the job safety never ends and we can never stop learning on how to improve our working environment.

I've been hearing about this "human factors" topic for quite a few years, especially Dave Thomas's (USFS) occasional references to this weird, squishy stuff. I had even heard about the first workshop before it occurred, but was in Minnesota on a fire during that event. After the past few days I'm overwhelmed,

all I can say is WOW, and I'm sure some of you feel the same. It will take me months to read, digest and contemplate on some of these topics expressed during the last few days. Fire fighting is no longer a subject of learning tool use, fire behavior/fuels, and physical fitness. It is progressing to a liberal arts education in functioning within our wildland fire fighting and fire use society.

I also feel that even though my friend and comrade Paul Gleason was not here, his memory and lessons were shared through out the conference. And while it would have embarrassed Paul to have been referenced so frequently, maybe he's thinking that in his own small way, and his willingness to discuss his own personal portal experience on the Dude Fire, he helped put our wildland fire organizations on a path from which we can't turn back.

There was also an excellent, continuous review of various human factor authorities / authors throughout the Summit. I'll have to expand my summer reading list.

Some of the important features I'll take away, "Tongue-in-Cheek."

- We learned why frogs die in hot water;
- We learned about the many "human factors" threads that when woven together form the much sought after Yellow Shirts apparent in many professions;
- We were introduced to recycled rectal thermometers and how their use could potentially improve fire fighter safety – if only we could divert maybe one more airtanker drop to research;
- Canada contributed the BOHICA factor, "Bend Over Here It Comes Again." Will this factor disappear with better understanding of "human factors?" Or only be implemented when Dr. Sharkey's research crew gets more money for those rectal thermometers?
- We learned about looking for holes in Swiss Cheese and transformational portals, and I began to wonder if this conference would also talk about string (cheese) theory and mad-cow disease.

On a more serious note, we learned that "human factors" is basically learning how to better understand ourselves and others, and through that process, we learn how to treat our fellow human beings better by incorporating truthfulness and trust at all levels of employee/management relationships. Further, we learned that we can use our life experiences to improve our work environment with the goal that everyone not only gets the job done but gets it done in a safe and healthy manner with everyone going home at the end of the day. Not an easy job in any group, and especially difficult in organizational cultures focused on positive end results where the end (wildland fire suppression, public safety, resource protection) sometimes justifies the means (inattentive management, unsafe working conditions, poor communications, etc.)

On “Day 1” our Session Chair, Kathy McAllister (USFS, Region 1, Deputy Regional Forester for Resources) introduced Bob Mutch (USFS, retired). In his “keynote” address Bob challenged us with the Zero Defect goal, or vision, of no injuries or fatalities in any wildland fire activity ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Mutch.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Mutch.pdf)). This goal was repeatedly referenced during the Summit – including the question of whether “Zero Defect” is a realistic “goal” considering the environment the wildland fire firefighting community works in; or, like any “goal,” something to be constantly strived for in spite of its loftiness. Bob reminded us that safety is career changing and a life long pursuit. He also reminded us of the topic of “Mindfulness” introduced by Ted Putnam at the 1995 Human Factors workshop. This ancient perspective has been added to our wildland fire cultural lexicon. Ted was able to elaborate during the conference on this same topic and others relating to exercising the mind to strengthen mental acuity, as well as differences in various philosophies which strive to explain the realm of consciousness.

Bob included in his talk reference to the differences in the United States / Australian evacuation philosophy, which I have observed can be a very divisive “human factors” topic here in the U.S. and which we will be hearing much more about in the near future. To accomplish improvements in firefighter safety, Bob reminded us that “we are all students of fire and leadership,” and that to move forward “information needs to be freely shared and acted upon.”

Bob was followed by Dr. Patrick Withen (Dept. of Sociology, U. of Virginia) who has developed the Ten Essential Factors in Firefighting (TEFF) ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Withen.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Withen.pdf)). Withen has discovered over 250 firefighting guidelines! But, he says, most of these guidelines can be condensed down to LCES combined with topics relating to Fire Behavior, Firefighter Resources, Fire Status and Fuel Type. He pointed out that most people rely heavily on Paul Gleason’s LCES.

Jim Cook (USFS) in his talk on the *Wildland Fire Development Program* pointed out that since 1995 “human factors” have been regularly presented in various forms in wildland fire conferences, summits, reports, and Task Group sessions ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Cook.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Cook.pdf)). At the end of his presentation Jim presented this year’s *Paul Gleason Lead by Example Award* to Ted Putnam. This award was created by the Wildland Fire Leadership Development Committee under the National Wildfire Coordinating Group in honor of Paul Gleason, a wildland firefighter whose career spanned several decades before his death from cancer in 2003. This award was developed to recognize individuals who lead by example, and for demonstrating leadership traits during or in support of wildland fire operations.

Cook noted that leadership and leadership training is a key “human factors” subject. He asked the question - Is supervision, leadership and management the same? He believed that leadership skills need to be developed early with

common sets of leadership values established for the profession. He also expressed concern that there needs to be a continuation of leadership training - from incident personnel up through and including organizational leaders

John Gould's (Bureau of Indian Affairs/National Interagency Fire Center) ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Gould.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Gould.pdf)) message to the conference attendees was to get accident/fatality information out to the users. Gould discussed the previous five years of SAFENET - an easily used, voluntary, confidential reporting system for wildland fire problems or incidents. SAFENET was an outgrowth of the Tri-Data Study started in 2000 and Jim outlined the system's last five years of development, growth and improvement. He noted that 27% of the reports SAFENET has received have involved or were classified as "human factors" topics.

Paul Chamberlain (USFS) introduced us to the concept of "portals" - life changing events which are frequently emotionally, intellectually and/or physically painful. All of us have experienced portals of one type or another and it's something easily related to ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Chamberlain.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Chamberlain.pdf)). Unfortunately, many of us have had these occurrences within our profession in wildland fire. After approximately 35 years in the profession I can identify several "professional" portals of my own, some more painful than others, some which I share with people in this audience. These events have shaped my professional career as well as how I treat my employees and the tasks assigned to them.

Dr. Jim Saveland (USFS) followed Paul and started his talk with a series of basic wildland fire statistics ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Saveland.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Saveland.pdf)). The ones Saveland showed which stuck with me was the point that one out of every five years (20% of the time) there will be no wildland fire fatalities within the U.S., based on historical trends. He pointed out that the same percentage of wildland fire seasons will also result in 9 or more fatalities per fire season. Saveland then broached a topic that has been a favorite of his for many years; *Signal Detection* as a tool to help detect errors and facilitate decision making and learning. He expressed the need to explore deeper causal models relating to decisions, and also introduced the concepts of "conflict or tension" between vision and truth as interpreted by Gandhi and Fritz.

Following Dr. Saveland we were introduced to Greg Vergari (USFS) and his presentation concerning "*Back to Basics*" for the fire program manager ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Vergari.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Vergari.pdf)). He brought up for the first time James Reason's *Swiss Cheese* theory, which was to be repeatedly referenced by later conference speakers. The *Swiss Cheese* theory illustrates decision making processes at multiple administrative layers that may or may not have error associated with them. These errors might be introduced into decisions making from any number of sources including fatigue, bad data, or a total lack of information altogether. Given the opportunity that the occurrence of errors, or "holes" in the various administrative layers of "cheese," would eventually align

themselves, Vergari pointed out that this alignment would increase the likelihood of the occurrence of an unplanned near-miss, an accident, or possibly a fatality. Vergari supported the idea of clearly written responsibilities for the various firefighting administrative positions as an aid to decision making, including the need for distinction between extended and initial attack. He also maintained the position that wildland fire fighting decision making procedures need to be practiced and results evaluated by entire wildland fire administrative staff.

Dr.'s Brian Shakey, Brent Ruby and Steven Gaskill (USFS, and the Dept. of Health and Human Performance, University of Montana) provided us with more than four decades of review focusing on the history of many wildland fire/human resource topic research projects, many of which can now be seen directly relating to the area of human factors

([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Sharkey\\_et\\_al.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Sharkey_et_al.pdf)). The speakers summarized past research and provided us with a glimpse of where they are heading in their future research. One of the researchers's key points included the fact that supporting and developing healthy and productive firefighters requires a very small agency financial investment with potentially substantial returns in the form of increased alertness, physical performance, and ultimately improved overall safety in high stress and physically strenuous field situations.

Deputy Chief Dan Northern (Novato Fire Department, CA) closed out our first day of conference with a discussion and review of the recent Cedar Fire fatality in Southern California ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Northern.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Northern.pdf)). Northern sequentially outlined and chronicled the chaotic fire environment that resulted in this tragedy.

Following the days presentations attendees were able to examine and meet with the authors of nineteen "Poster Papers" covering a wide range of human factor related topics. Rather than listing these "Posters" individually within this Conference Summary I would encourage you to examine them individually at your leisure ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_presentations.shtml](http://www.iawfonline.org/summit/2005_Presentations/2005_presentations.shtml)).

A new day began with fresh snow on the nearby hills and mountains as well as fresh speakers with new but related "human factor" topics! The Session Chair on this day was Dick Rothermel (USFS, retired), a previous recipient to the *IAWF Wildland Fire Safety Award* at the last Safety Summit™ held in Missoula for his pioneering work in fire behavior modeling and interpretation. Several presenters had a common thread of "story telling" as a "human factor" tool. Story telling is probably one of those deeply ingrained evolutionary tools humans have developed to pass along survival information. Story telling has deep psychological ties to our learning in terms of how we came to trust and use fire as a tool. Where are the best stories told but around the campfire? Dave Thomas talked about the Fire Staff Rides

([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Thomas.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Thomas.pdf)), Leslie Anderson (and Jon Driessen and Lisa Outka-Perkins, all USFS) talked about gathering stories for

developing a better understanding of crew cohesion and trust factors

([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Driessen et al.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Driessen_et_al.pdf)).

Dr. Jennifer Thackaberry (Dept. of Communications, Purdue University) moved us in the direction of understanding the fire orders as a form of work ethic and a moral code for the wildland fire community

([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Thackaberry.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Thackaberry.pdf)). She introduced us to the “Duty vs. Virtue” ethical conflict and during the questioning period she was asked by Los Padres Hot Shot crewmember Brad Mayhew if maybe we might be moving toward “Utility” ethics as well. (Mayhew also submitted a Safety Summit™ “Poster Paper” titled *In Pursuit of a Human Factors Tool for Wildland Firefighters*.) It also occurred to me that there might be a story basis to this as well in our culturally taught understanding of “duty vs. virtue” in the context of the King Arthur and Camelot tales of ancient England where Sir Lancelot the virtuous knight failed in his duties to both his King and their society. Dr. Thackaberry said she would have to take a closer look at this story before commenting on that off the cuff association. I don’t blame her for being hesitant; my casual thought might be a reach!

At this point in the conference we entered into strong international examples of “human factor” work and organizational influence on improving wildland fire safety. We were told to slow down and communicate better (Jules Leboeuf, Alberta Provincial Fire Center) ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Leboeuf.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Leboeuf.pdf)). Australia (Greg Esnouf, County Fire Authority) told us about their *Comprehensive Operations Performance Improvement Program* and how that was progressing ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Esnouf.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Esnouf.pdf)). The Australian experience in collecting stories and additional data on unsafe practices was also presented by Mary Omodei (Dept. of Psychological Science, La Trobe University)

([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Omodei.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Omodei.pdf)). In a separate talk presented by Michelle Ryerson, Bureau of Land Management (BLM), and Chuck Whitlock (USFS, retired), we also learned how a similar project in the US was fairing, and heard that a conservative estimate of 80% of wildland fire accidents are “human factor” related, which aren’t easily observed or measured – especially by investigators not trained to look at “human factors”

([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Ryerson and Whitlock.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Ryerson_and_Whitlock.pdf)). Colonel Eric Peuch from France provided us with a very interesting perspective on their country’s wildland fire organizations response to “human factor” issues, including how the design of their fire fighting equipment is taken into “human factor” consideration ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Peuch.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Peuch.pdf)). Portugal (Dr. Domingos Viegas) contributed information on a study to improve firefighter safety through a better understanding of “eruptive” fire behavior on slopes with a wind influence ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Viegas et al.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Viegas_et_al.pdf)). Obviously “human factors” have global interest, and the momentum and impact of this subject area on the wildland fire community will only increase.

At the end of the day's session we had a well received panel discussion (Lark McDonald, Mission-Center Solutions, Inc.; Dave Thomas (USFS), and Bill Miller (USFS) lead by Michael DeGrosky (The Guidance Group, Inc.) which covered a wide range of "human factors" topics. Audience participation was strong and had to be brought to an end by the clock, but continued out into the hall and I'm sure the local pubs. A few of the points made in the panel/audience interaction included the observation that a generational or phase change is occurring which is allowing "human factors" to not only be accepted - but expected, as well as the fact that the emergence of "Human Factors as they relate to the fireline" has been a grassroots development and is rapidly maturing. Another portion of the panel discussion centered on honesty and truthfulness between organization layers needing to be a mission. At the end cards were passed out for further audience input on what they considered important topics and the return rate was exceptional. After a first review of the cards, general topic categories (and frequently mentioned subtopics) that dominated areas for more information and management concern included:

#### Leadership

- ✓ Liability/accountability – fear of retribution
- ✓ Mentor, identify, and support new generation to lead
- ✓ Trust amongst each other and leadership

#### Education

- ✓ Experience/Inexperience
- ✓ Leadership/Mentoring
- ✓ Teach/Engage/Train
- ✓ Homeowners

#### Communications

- ✓ Interact/share with others agencies, local communities
- ✓ Educating people on communications + briefings techniques, people skills
- ✓ Decision-making skills
- ✓ Reports, papers being written, action by agencies being to slow
- ✓ Interpersonal dynamics
- ✓ Truthfulness

#### Management

- ✓ Recruit and train young leaders
- ✓ Apply "Human Factors" to management
- ✓ Unrealistic Expectations
- ✓ Budgets don't allow consistent hiring & training
- ✓ Lack of Performance Standards for management
- ✓ Strive to detect problems prior to accidents (signal detection)
- ✓ Improve interagency standards and interagency involvement
- ✓ Need to take a doctrinal vs. rules approach
- ✓ Common voice and experienced leadership to obtain funding and support needed
- ✓ Focus on the positive – reward success

- ✓ Do not normalize deviance, establish and maintain standards and hold people accountable
- ✓ Dedicated human factors unit at NIFC
- ✓ Educate senior management on human factors

The evening banquet, which was held at the University of Montana campus, attracted an attentive audience. The highlight of the evening included the honoring of Dr. Ted Putnam with the *IAWF Wildland Fire Safety Award* for his demonstrated long-term passion for wildland firefighter safety, including his work in presenting the first “Human Factors” workshop in 1995.

Following the award ceremony, guest speaker, and author, John McLean presented *The New Age of Fire: Storm King and Beyond* in which he pulled together similarities and personal experiences from several wildland fatality fires including Mann Gulch, South Canyon and the Cramer Fire.

On our third and final Safety Summit™ day Tim Love (USFS) served as Session Chair. We dove into liability and insurance issues under the direction of Mike Johns (Asst. US Attorney) ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Johns.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Johns.pdf)). Professional Liability is another hot topic which will continue to dominate wildland fire community discussions (and not just in the United States as was pointed out in some of the questioning). In the private sector this has been a big problem for along time. We are now seeing it impact the government sector as well.

Paula Nasiatka (National Park Service) moved us into the organizational learning arena, showing us the many accomplishments achieved by the *Wildland Fire Lessons Learned Center* in the few years since it was established ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Nasiatka\\_and\\_Christenson.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Nasiatka_and_Christenson.pdf)). The Center directors have plans to accomplish much more with help from the wildland fire community. Part of the improved organizational learning will be accomplished by better After Action Reports (AAR). After Paula, we heard more on the topic of AAR's from Michael DeGrosky, who the previous day had led the panel discussion ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/DeGrosky.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/DeGrosky.pdf)).

Dr. Ted Putnam gave us an introductory course in “Deep Psychology” examining differing philosophies in using our intellectual capabilities ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Putnam.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Putnam.pdf)).

During the final afternoon we had presentations dealing with fire behavior indicators for rapid fire spread (Tom Leuschen, USFS) ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Leuschen.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Leuschen.pdf)), and also fire behavior impacts of the recent Cramer Fire with comparisons to the 1994 South Canyon both of which had eerily similar human factor complications (Kelly Close, Poudre Fire Authority, Ft. Collins, CO) ([www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/Close.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/Close.pdf)). We also had an excellent presentation by Lark McDonald evaluating crew attitudes toward wildland fire culture and safety

[www.iawfonline.org/summit/2005\\_Presentations/2005\\_pdf/McDonald\\_and\\_Shadow.pdf](http://www.iawfonline.org/summit/2005_Presentations/2005_pdf/McDonald_and_Shadow.pdf)). Future evaluations along these lines will be enlightening in interpreting the overall trends of “human factors” for both management and crew as time progresses

All-in-all this has been from my perspective an excellent conference, which as I had mentioned before, shows us that wildland fire fighting has become a liberal arts education which demands of us considerations beyond how to extinguish unwanted fires.

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All of the above papers, as well as the files from previous IAWF Safety Summits™ since 1997 are available on CD at a cost of \$25 (US). An [order form](#) can be downloaded from the IAWF website.