

HIGH RELIABILITY ORGANIZING
WHAT IT IS, WHY IT WORKS, HOW TO LEAD IT

**Sponsored by the
Fire and Aviation Directorate
Division of Fire Operations**

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ABSTRACT

In March, 2010, the BLM Fire and Aviation Directorate's Division of Fire Operations hosted a three-day training session on high reliability organizing (HRO). Participating in this training were national, state, and unit level fire managers from throughout the BLM—almost the entire senior leadership in the BLM fire program.

The intent of the training was to establish a common understanding of high reliability organizing and to build an initial foundation for implementing high reliability practices throughout the BLM fire program. At the conclusion of the session, each state identified initial actions they would take in their effort to establish HROs in their programs.

Based on positive feedback from the session and a common desire among all BLM fire leaders to excel in all areas of fire operations and risk management, follow-up actions are planned. Actions include reports from states on their successes after the 2010 fire season and, tentatively, a follow-up to this HRO training session in the near future.

This publication is intended to summarize the high points of the training session and to informally document the initial planned actions of BLM fire managers toward implementing HRO practices.

BLM DIRECTOR BOB ABBEY'S OPENING REMARKS (Video Message Excerpts)

Good morning. I'm pleased to kick off BLM's fire management conference focusing on high reliability organizations. My purpose today is two-fold. First, to offer my views about fire and aviation and where the program needs to head; and second, express my strong support for making BLM a high reliability organization particularly in fire and aviation where the risk is high and the work is crucial to protect life, property, and vital natural resources.

Although the 2009 fire season was light in most of the West...history shows us that widespread and severe wildland fire activity will return. We cannot afford to be complacent. When things go right for a long period of time, it's all the more signal that we need to be more aware, more prepared, more able to respond appropriately to whatever the situation demands. Nothing affects our resources faster for both good and ill than does fire.

As you position the fire program for the future, you face a number of difficult but doable tasks related to further integrating fire and resource management—achieving and communicating steps underway to accomplish new fire policy implementation strategies, continuing your cost management efforts, and more. I am confident, however, that you have the knowledge and experience to manage these challenges in a positive manner.

Fire and Aviation is the largest single program in the Bureau of Land Management and one of the most visible. Because of that, I expect nothing but the highest standards of integrity, conduct, and performance.

So, your challenge is clear as leaders in the fire program—you must keep one eye on the present and one eye on the future and take the steps now to recruit, train, and retain a new generation of capable and qualified fire and aviation managers and leaders. If we do not act now, the future may be bleak.

Let me say right at the top, I'm a firm believer in HRO principles; and I believe they need to be adopted and practiced throughout our agency. Safety is of critical importance in every area of BLM fire operations. However, wildland firefighting is an inherently dangerous undertaking.

The "Red Book" states, "Our safety philosophy acknowledges that while the ideal level of risk may be zero, a hazard-free work environment is not a reasonable or achievable goal in fire operations." For this reason, we're never satisfied. We are driven to improve. Even when we perform exceptionally well for long periods of time, we are uneasy. We know a mistake, an oversight, or a short lapse of attention might just be around the corner. We know we can do better. These very characteristics, our constant drive to improve, our refusal to be complacent, our perpetual uneasiness even when things are going well, our ability to recover quickly are characteristics common to high reliability organizations. This conference on HROs is part of our unending effort to improve. Thank you for being here.

Finally, I hope you leave this conference with a better understanding of high reliability organization theory... and of its relationship with various other organizational concepts, ideas, and practices. Most importantly, I hope you leave with an idea of how you might develop or improve HRO practices in your organization. Then my expectation is that you will go home; and armed with what you've learned this week, you will begin to make the needed changes in your area of responsibility. Please know that you have my support and backing.

(The complete transcript can be found at:

http://www.blm.gov/nifc/st/en/prog/fire/training/fire_training/hro.html)

INTRODUCTION

The intent of this training was to help BLM fire managers build highly reliable wildland fire organizations at the national, state and district levels.

The training was conducted in workshop format with various speakers sharing knowledge and implementation ideas. Donna Hunter and Dave Thomas facilitated the training session, providing their expertise on high reliability organizing. Jim Saveland appeared as a guest speaker on communications.

JIM DOUGLAS

FIRE AND AVIATION, ASSISTANT DIRECTOR

- *"The future of BLM fire is tied up with the Quadrennial Fire Review (QFR). "The QFR is our north star."*
- *"IFPM requires us to maintain a well trained and qualified workforce."*
- *"Be leaders, set standards, and lead by example. Push these HRO principles into your organizations."*

TIM MURPHY

FIRE AND AVIATION, DEPUTY ASSISTANT DIRECTOR

- *"It has been 10 years since the State and Unit level Fire Management Officers (FMOs) have assembled together with National Fire Program Leaders. In that time, the BLM has seen many successes and a few failures. We know there are no such things as close calls...these are lessons."*
- *"We must continue to promote and adhere to the principles of high reliability organizing."*
- *"This conference is a fundamental step in improving our capabilities."*

HRO ~ WHAT IT IS

In 1984, a group of University of California researchers studied operations and organizational culture in three organizations: the air traffic control system, a nuclear power plant, and U.S. Navy aircraft carriers. Their intent, broadly, was to determine why some organizations that routinely operate in high risk environments endure less than their fair share of accidents.

The term “high reliability organization” (HRO) came from this research. Little hard data exists to quantify HROs, but researchers have broadly defined them, and they have described HRO qualities and characteristics. These descriptions may prove useful to organizations that are attempting to model practices and achieve results of high reliability organizations.

DEFINITIONS OF A HIGH RELIABILITY ORGANIZATION

- An organization that operates continuously under trying conditions and has fewer than its fair share of major incidents. (*Karl E. Weick and Kathleen M. Sutcliffe*)
- An organization that has succeeded in avoiding catastrophes in an environment where normal accidents can be expected due to risk factors and complexity. (*Wikipedia*)

CHARACTERISTICS OF HROS

- Preoccupation with failure.
- Reluctance to over simplify.
- Sensitivity to operations.
- Deference to expertise.
- Commitment to resilience.

HRO IN BLM FIRE OPERATIONS

There are a number of concepts, systems, methods, and models that can be used by an organization in its pursuit of a safety culture. Many are useful, and most are complementary to one another. HRO theory is one of them. Goal #5 of the BLM Fire and Aviation Strategic Plan is to develop a high reliability organization. Toward this end, BLM fire personnel are encouraged to study HRO characteristics, or any other constructive safety practice, and apply them to their own units.

HRO ~ WHY IT WORKS

Karl Weick and Kathleen Sutcliffe cite wildland firefighting crews as one example of a high reliability organization in their book, *Managing The Unexpected – Resilient Performance in an Age of Uncertainty*. They ask their readers to use our organization as a benchmark, “*not because they ‘have it right’ but because they struggle to get it right on a continuous basis.*”

HRO: A DISCIPLINE OR A RECIPE?

Donna Hunter explained to attendees that HROs are developed more through discipline than following a recipe for success.

The goal of HRO is to have employees operate in a hyper-vigilant state of mind. Hyper-vigilant employees “*recognize even subtle signals, and know that the signal was significant in context.*”

Quoting Karlene Roberts in *New Challenges to Understanding Organizations*, Hunter noted that employees in HROs:

1. Seek perfection but never expect to achieve it.
2. Demand complete safety but never expect it.
3. Dread surprise but always anticipate it.
4. Deliver reliability but never take it for granted.
5. Live by the book but are unwilling to die by it.

The four key pillars for sustainable risk management taken from James Reason's *Managing the Risks of Organizational Accidents* are:

- **Reporting Culture** ~ Safety cultures are dependent on knowledge gained from near misses, mistakes, and other "free lessons." People must feel willing to discuss their own errors in an open, non-punitive environment.
- **Just Culture** ~ An atmosphere of trust where people are encouraged to provide essential safety-related information yet a clear line is drawn between acceptable and unacceptable behavior.
- **Flexible Culture** ~ One that adapts to changing demands by flattening hierarchies and deferring to expertise regardless of rank.
- **Learning Culture** ~ The combination of candid reporting, justice, and flexibility enables people to witness best practices and learn from ongoing hazard identification and new ways to cope with them.

To be a premier organization we must:

- Feed the learning back into the organizations
- Encourage team members to ask critical questions.

HRO ~ THE FIVE BASICS PRINCIPLES

DAVE THOMAS AND DONNA HUNTER

1. PREOCCUPATION WITH FAILURE

- Vigilant attention to early detection of small errors.
- Encourage reporting of errors and near misses.
- We should be worried we haven't caught everything...we worry when things are going too smoothly...we realize that any lapse is a symptom that something could be wrong with the system.
- We tend to look at large errors with catastrophic consequences but we should look for small failures to avoid large errors. We should be preoccupied with failure before an event occurs.
- We should look at fatality incidents starting months before the accident and ask ourselves, "Why did everything they did make sense to them at the time?"

2. RELUCTANCE TO OVER SIMPLIFY

"Checklists have their place so we shouldn't throw them out because they are over simplified. Rather, we need to continually ask ourselves what we are missing in our over-simplification." ~ Michelle Ryerson, BLM Safety Manager

- This is not the KISS (Keep It Simple and Short) theory. While checklist and standard operating procedures (SOPs) help us stay focused on key issues and indicators, we know that to manage for the unexpected, we should be reluctant to accept over-simplification.
- We must overcome the tendency to simplify by inviting skepticism to conventional wisdom, questioning standard procedures, and reconciling diverse opinions.

3. SENSITIVITY TO OPERATIONS

Quote: “When they (HROs) ‘recognize’ an event as something they have experienced before and understood, that recognition is a source of concern rather than comfort. The concern is that superficial similarities between the present and the past mask deeper differences that could prove fatal.” ~ Karl E. Weick

- Even small variations in operations deserve individual attention.
- A vigilant eye on operations helps us make continuous adjustments that prevent small errors now before they become large errors in the future.
- We must notice anomalies while they are still tractable and can be isolated. They need to be caught before they escalate into a catastrophic accident.
- Most accidents are not the result of a single error, but rather an accumulation of numerous small errors that result in a disproportionately large accident.

“We look at our organization like an air traffic controller looking at a radar screen...looking for weak signals that just beep on occasion. This is how we maintain an organizational preoccupation with failure and sensitivity to operations.” ~ Sheldon Wimmer, SFMO Utah

4. DEFERENCE TO EXPERTISE

- HROs push decision making down to the front line (point of the spear), and authority migrates to the person with the most expertise, regardless of rank.
- Expertise is not confused with experience. Experience by itself does not guarantee expertise. We must scan up and down the chain of command to find the right expertise needed to handle the current or potential problem.
- Decision making should migrate to the person with the unique knowledge needed to confront the given situational complexities.

5. COMMITMENT TO RESILIENCE

- HROs have the ability to be stretched and still bounce back. They continuously evaluate the worst case scenario and practice internal fire drills.
- They know they haven't seen all the ways that a system can fail.
- HROs cultivate employees to confront organizational obstacles and actively find solutions or workarounds.
- HROs are vigilant at keeping errors small and improvising workarounds that allow the system to keep functioning.

“HROs put a premium on training, personnel with deep and varied experience, and skills of recombination and making do with whatever is at hand.” ~ Karl E. Weick and Kathleen M. Sutcliffe

ORGANIZATIONAL INPUTS TO A RESILIENT SYSTEM

The ability to deal with an emergency situation is dependent on the systems, structures, and cultures put in place before a crisis occurs. Resiliency includes both individual and organizational inputs. These inputs include:

- Knowledge gained through openness and sharing of information.
- Accumulated experience.
- Facilitated learning.
 - Maximize a reporting culture.
- Restructuring to meet demand of the organization not previously anticipated.
- Coping with unforeseen challenges.
- Flexibility and adaptability in available people and resources to mitigate challenges.
 - We need to have the right people with the right authority to make decisions in a timely matter.
 - We feel empowered to take drastic measures when necessary; e.g., closing down a major freeway during a wildfire or exercising the right to turn down an assignment.

HOW DO WE MAINTAIN RESILIENCY?

- Sponsor leadership courses which stress communications and the ability to speak up at all levels of the organization.
- Lead by example (show quick decision making or play “what if” games).
- Run premortem and postmortem exercises.

PREMORTEM EXERCISES

Premortem exercises are very powerful tools that begin by looking at an incident that will take place in the near future. All participants are instructed to assume that something went spectacularly wrong and are then asked to determine the cause of this tragic ending, and identify ways of preventing this failure from happening. Premortem exercises:

- Can be done on a scheduled prescribed fire or in an incident action plan (IAP).
- Let all participants introduce their idea of what went wrong. Supervisors invite subordinates to tell them how this incident or plan can fail.
- Look for blind spots.
- Determine ways to prevent this failure.

POSTMORTEM EXERCISES

Postmortem exercises look at a past incident. Participants identify what happened and then analyze why it happened. Postmortem exercises:

- Are more in depth than an after action review (AAR) but not as detailed as an investigation.
- Look at organizational systems months before the incident.
- Are designed to avoid hindsight bias.

COLORADO’S COMMITMENT TO RESILIENCY

KEN KERR, COLORADO STATE FMO

Ken Kerr shared his thoughts on how his fire program in Colorado learned the hard way to bounce back after a brutal audit of their program.

He explained that although external audits can be brutal, they can also prove to be extremely valuable in maintaining a commitment to resiliency. They force you to look at your organization through a new set of eyes and see your operation differently. They also teach you how to deal with distractions, especially when they happen in the middle of a busy fire season.

BLM SMOKEJUMPER PROGRAM

SEAN CROSS, BLM PREPAREDNESS/SUPPRESSION STANDARDS CHIEF
AND HECTOR MADRID, BLM BOISE SMOKEJUMPER CHIEF

Sean Cross and Hector Madrid talked about the reviews that the BLM smokejumper program went through following the fatal parachuting accident of Dave Liston in 2000 and the systemic changes made to the program after the incident. The BLM smokejumper operations were shut down for almost three months while program reviews were conducted. The reviews confirmed many positive aspects of the smokejumper program and offered constructive suggestions for improvement.

Madrid explained the Boise Smokejumpers’ Malfunction/Abnormality Reporting System (MARS) which was initiated after the Dave Liston accident. The system was designed to encourage any employee to report what may be considered even the most minor abnormality in smokejumper operations or the parachuting system.

He explained that the idea was difficult for the crew to buy into at first as they thought it may lead to another shut down of operations. But over a number of years, the crew saw the benefits of reporting. Managers encouraged reporting by offering time-off awards as incentives.

COMMUNICATION TOOLS

JIM SAVELAND

Effective communication is an important component of HROs. Jim Saveland introduced several tools that participants could incorporate into their operations. He challenged managers to:

- Discover a collective meaning of applying HRO in BLM fire management operations that is larger than any one individual.
- Be better able to “speak truth to power” (respectful interaction).
- Be able to incorporate new concepts into their daily language.

HOW TO LEAD IT ~ LOOK FOR SMALL WINS

Successful implementation of the HRO principles can be found in adopting a small wins strategy which is “a change strategy built around consistent, incremental small changes that produce visible results.” (*Karl E. Weick*)

As the BLM moves forward with HRO implementation, the intent is to provide support from the national level to the individual BLM state implementation plans, which are designed to fit their cultures and specific ways of doing business.

During the training session, each state was asked to identify what they believed were achievable small wins and what self audits would be conducted to test their organization’s HRO principles. The following two pages list each BLM state’s commitments to maintaining these principles.

“Most organizations try to take on large changes and never get to them. If you look for small wins...if they fail...no big deal. You dust yourself off and try something else, but you don’t get bogged down on a large undertaking.” ~ Karl E. Weick

HOW TO LEAD IT ~ STATE COMMITMENTS

ALASKA

- Introduce HROs as a sense of duty and obligation.
- Value diverse opinions.
- Nurture value of the devil's advocate role.
- Renew commitment to firefighters in the field.
- Require that managers visit the field to gain an understanding of field operations.
- Nurture the values of trust and honesty.
- Conduct all-employee AFS meetings.
- Support cohesion in the organization.
- Embrace SAFENETs and require a faster and cleaner submission to managers.
- Incorporate HRO language into work operations.

ARIZONA

- Formalize support of the HRO principles.
- Involve line officers.
- Conduct premortem exercises (fire operations, fuels, and dispatch) on a project-by-project basis.
- Learn from our successes—critical thinking of operations.
- Incorporate the HRO principles into mission statements.
- Involve FOSs by having them train their crews.
- Utilize HRO subject matter experts during presentations.
- Decrease the focus of a district mentality and instill a more corporate mentality.
- Leave egos at the door.
- Encourage ownership at the ground level.
- Listen.
- Instill a bounce-back mentality.
- Post premortems on the state Sharepoint site.

CALIFORNIA

- Instill getting-back-to-basics and pay-attention-to-details attitudes.
- Consider worst outcomes during briefings
- Foster a no-recourse-for-reporting culture.
- Create an anonymous reporting blog or system.
- Have outsiders look inside and give feedback.
- Get another perspective. Have internal agency SMEs review various programs.
- Ensure proper authority to empower people to make decisions.
- Support our people when they make decisions.
- Promote the concept of shared risk.
- Work as a team recognizing everyone's strengths.
- Seek the talents in each module.
- Train through lessons learned.
- Use a reward system.
- Instill trust in the organization.
- Have top management get in touch with ground forces.
- Ensure that the rollout has a clear and consistent message.

COLORADO

- Provide a formal and informal level understanding of HRO from state to ground levels.
- Utilize the Oregon poster card (see back cover) in training to keep HRO foremost in firefighters' minds.
- Use the premortem process prior to first spring burn/cutting operation/aviation mission.
- Instill HRO principles in weekly conference calls by asking what they see as our weak signals.
- Utilize current reporting systems more effectively.
- Tie HRO principles into field drills and improvisations.

NEW MEXICO

- Foster our current commitment of the HRO principles from top management levels to the ground firefighter.
- Introduce HRO principles in the preseason meetings and refreshers.
- Do premortems to identify weak signals.
- Create a signal for HRO.
- Track our progress.

IDAHO

- Keep lines of communication open and make sure everyone is on board.
- Nurture HRO principles at all levels.
- Instill premortems as part of regular jobs.
- Revisit past lessons and reports.
- Go through AARs and see if we acted on the findings and got to the root cause.
- Keep the “bubble” in line (can be an incident, district, crew and it is not static but continuous).
- Identify, develop and use internal experts.
- Have redundancy in cross training.
- Learn from the outside of the organization.

NEVADA

- Introduce HRO at the state preseason meeting.
- Perform weekly FMO calls to check on the status of HRO implementation.
- Perform premortems; e.g., fuels program.
- Do an AAR in the fall to determine how we did and roll out at an interagency meeting.

OREGON

- Perform premortems and use as a way to build the spring meeting.
- Address worst-feared failures.
- Distribute and promote the HRO card (see back cover) to the State leadership fuels team members in the spring.
- Focus HRO training on GS 3-9 personnel and western Oregon militia.
- Show top-level commitment and foster lower-level ownership.
- Develop an HRO toolbox.
- Utilize the Lessons Learned Center’s website.
- Develop a learning culture to foster a just and reporting culture.

MONTANA

- Perform premortems for burn plans.
- Use meetings and weekly calls to introduce the HRO ideas.
- Look at what we have taken for granted; e.g., drip torches.
- Increase refreshers and currency training.
- Improve the feedback loop.
- Eliminate surprises when events occur.
- Talk about events regularly.
- Develop a state-wide matrix to identify skills and use them when needed.
- Keep all AFMOs and FMOs on IMTs current with assignments.
- Expose FMOs to different districts.
- Develop ways to present HRO to all levels.

UTAH

- Foster a commitment to the HRO principles.
- Present HRO to District Managers during preseason meetings and get buy in.
- Do an HRO workshop within the next year.
- Incorporate HRO into SFM plans.
- Start a reporting reward system.

WYOMING

- Perform weekly premortems from the ground level up.
- Perform monthly external premortems with outside entities.
- Review the LCES checklist and personalize and de-simplify them.
- Commit to leadership training.
- Provide spot checks on the line. Have crews rotate spot checks on other crews' engines.
- Appoint a Situation Officer.
- Recognize successes.
- Utilize external experts (fallers and city fire department personnel).

NIFC

- Secure an agenda spot on state aviation manager calls to determine the status of HRO implementation.
- Strengthen our reporting system.
- Incorporate the Australian method of filling out a card from the field versus web-based systems.
- Embrace and rely on new technology and start utilizing tools such as social networking.
- Adopt the premortem process.
- Incorporate HRO principles into national reviews.
- Brief national safety team and risk management committees on HRO principles and attempt to integrate into NWCG.

CLOSING COMMENTS ~ DAVE THOMAS

Thomas explained that learning these principles is only the first step. Leading an HRO is a continuous discipline that requires practice, diligence, and ownership at all levels of an organization. He noted that it is easy to lose the HRO principles in the midst of other fire related terminology. For example, *Deference to Expertise* may seem at odds with command and control, *Reluctance to Simplify* may appear at odds with our checklist mentality and custom, and *Sensitivity to Operations* may seem to oppose standard operating procedures. But they are not opposites! They actually work together and are continuous. The key is to maintain a learning culture and dive deep into these five HRO principles at all levels of the organization.

“The difference between a beginner and the master—the master practices a whole lot more.”

~ Yehudi Menuhin

“I have not seen any organization like this come together with their top management to embrace these concepts...what has happened here this week has been remarkable.” ~ Dave Thomas

CLOSING REMARKS ~ TIM MURPHY

“The word passion was used a lot this week, and you people really have it. I asked at the beginning of this week if we are prepared for the unexpected. I hope that because of this week you are better prepared to do your jobs...I know I am. We may be practicing this already but looking at the five HRO principles will help us become even better prepared...I encourage you all to lead your groups into a safe and successful fire season.”

FURTHER INFORMATION ON HROS

The Wildland Fire Lessons Learned Center website has an abundance of material on HROs in fire operations at <http://www.wildfirelessons.net/HRO.aspx>.

RECOMMENDED READING ON HROS

- *Beyond Aviation Human Factors*, Daniel E. Maurino, et al.
- *Managing the Risks of Organizational Accidents*, James Reason
- *Managing the Unexpected*, Karl E. Weick and Kathleen M. Sutcliffe
- *New Challenges to Understanding Organizations*, Karlene H. Roberts
- *Normal Accidents*, Charles Perrow
- *The Limits of Safety*, Scott D. Sagan

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