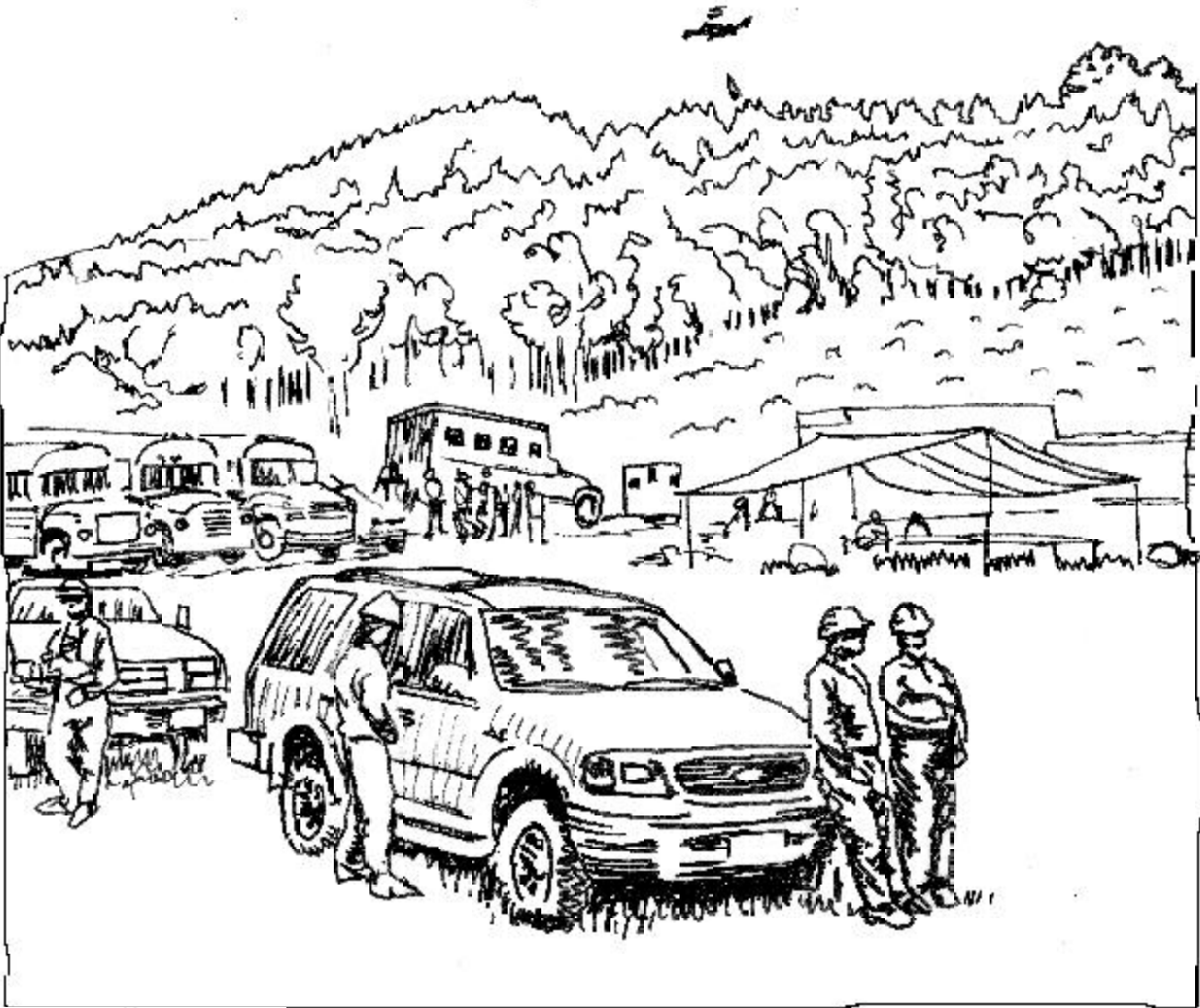


# Tactical Decision Making in Wildland Fire

## S-336



NFES 2120

Pre-Course Work

APRIL, 2004





## CERTIFICATION STATEMENT


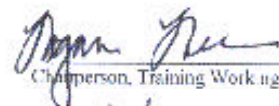
on behalf of the

### NATIONAL WILDFIRE COORDINATING GROUP

*The following training material attains the standards prescribed for courses developed under the interagency curriculum established and coordinated by the National Wildfire Coordinating Group. The instruction is certified for interagency use and is known as:*

Tactical Decision Making in Wildland Fire, S-336  
Certified at Level I

This product is part of an established NWCWG curriculum. It meets the COURSE DEVELOPMENT AND FORMAT STANDARDS - Sixth Edition, 2003 and has received a technical review and a professional edit.

 Member NWCWG and Training Working Team Liaison	 Chairperson, Training Working Team
Date: <u>4/23/04</u>	Date: <u>4/19/04</u>



# Tactical Decision Making in Wildland Fire S- 336

Pre-Course Work  
APRIL, 2004  
NFES 2120

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## Description of the Performance Based System

The NWCG Wildland and Prescribed Fire Qualifications System is a “performance-based” qualifications system. In this system, the primary criterion for qualification is individual performance as observed by an evaluator using approved standards. This system differs from previous wildland fire qualifications systems which have been “training based.” Training based systems use the completion of training courses or a passing score on an examination as primary criteria for qualification.

A performance-based system has two advantages over a training based system:

- Qualification is based upon real performance, as measured on the job, versus perceived performance, as measured by an examination or classroom activities.
- Personnel who have learned skills from sources outside wildland fire suppression, such as agency specific training programs or training and work in prescribed fire, structural fire, law enforcement, search and rescue, etc., may not be required to complete specific courses in order to qualify in a wildfire position.

1. The components of the wildland fire qualifications system are as follows:

- a. Position Task Books (PTB) contain all critical tasks which are required to perform the job. PTBs have been designed in a format which will allow documentation of a trainee’s ability to perform each task. Successful completion of all tasks required of the position, as determined by an evaluator, will be the basis for recommending certification.

IMPORTANT NOTE: Training requirements include completion of all required training courses prior to obtaining a PTB. Use of the suggested training courses or job aids is recommended to prepare the employee to perform in the position.

- b. Training courses and job aids provide the specific skills and knowledge required to perform tasks as prescribed in the PTB.
- c. Agency Certification is issued in the form of an incident qualification card certifying that the individual is qualified to perform in a specified position.

2. Responsibilities

The local office is responsible for selecting trainees, proper use of task books, and certification of trainees. See Appendix A of the NWCG Wildland and Prescribed Fire Qualification System Guide, PMS 310-1, for further information.





## PREFACE

The pre-course work for S-336 contains four parts. The first is a paper by John Krebs encouraging a return to the original format of the Standard Firefighting Orders. The second part discusses Recognition Primed Decision Making, an intrinsic skill employed by tacticians. The third part, Tactical Engagement Principles applies tactical doctrine employed by military organizations to wildland fire. The fourth part, DRAW D, offers a tactical framework for wildland fire engagement decision making.

In addition to the reading included above, students are expected to be thoroughly familiar with the contents of the Wildland Fire Suppression Tactics Reference Guide (PMS 465, NFES 1256), and the human factors, communication and leadership concepts learned in prerequisite courses.

The units in Wildland Fire Suppression Tactics, S-336 will expand upon the training, knowledge and experience you possess as a firefighter to enhance your ability as a tactical leader. The course is not so much about what tactic to employ when, where, or why, as it is about how successful tactics are developed to accomplish strategies and your role in *processing the incident assignment*.

During the course exercises you will be expected to:

- Deliver and receive oral communication, as you would on an incident, either face to face or on the radio.
- Apply the concepts found in the pre-course work reading to tactical scenarios, in particular the Standard Firefighting Orders and Watchout Situations.
- Apply the Incident Response Pocket Guide and Fireline Handbook to tactical scenarios.
- Apply the human factors, communication, leadership and tactical knowledge gained from previous courses.
- Participate, as either leader or follower, in developing and executing commander's intent in tactical scenarios.

Please take time to add a few acronyms to your vocabulary. These may be new to you, or you may have heard of them in previous courses. These acronyms derive from the Incident Response Pocket Guide and will be used throughout the course:

- SA = Situational Awareness
- RMP = Risk Management Process

You are **required** to bring a current version Incident Response Pocket Guide **and** Fireline Handbook to the course.

You are encouraged to bring from your home unit examples of Size-up Reports and “incident organizer” forms (similar to the ICS-201 form) for use in course exercises.

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## **PART 1**

### **STANDARD FIREFIGHTING ORDERS**

The following is quoted from a February 25, 2003 memorandum from the National Wildfire Coordinating Group to the NWCG working teams.

The original ten Standard Firefighting Orders were developed in 1957 by a task force commissioned by the USDA-Forest Service Chief Richard E. McArdle. The task force reviewed the records of 16 tragedy fires that occurred from 1937 to 1956. The Standard Firefighting Orders were based in part on the successful “General Orders” used by the United States Armed Forces.

The Standard Firefighting Orders were organized in a deliberate and sequential way to be implemented systematically and applied to all fire situations. The reorganization of the Orders was undertaken in the late 1980’s to form an acronym (“FIREORDERS”), thus changing the original sequence and consequently, the intent of the orders as a program and logical hazard control system.

Upon joint recommendation of the NWCG Training, Safety & Health, and Incident Operations Standards Working Teams, NWCG approved the restoration of the original ten Standard Firefighting Orders, with minor wording changes, at the May 22-23, 2002 meeting in Whitefish, Montana.

We feel this change back to the original intent and format will improve firefighters’ understanding and implementation of the ten Standard Firefighting Orders. Please ensure this information is passed on to all your fire management personnel.

Many fire managers noted over the last several years that firefighters of all qualifications were taking actions on fires that did not apply their fire behavior training and experience based on observing wildland fires. The following letter from Jim Steele and John Krebs provided the motivation to return to the original Standard Firefighting Orders.

Over the past several years our attention to safety paradigms has become more a checklist tool to measure our failures than to successfully guide firefighters through a safe assignment. We are continually told to pay attention to the fundamentals, yet our understanding of many fundamental tasks is poor to nonexistent. Rarely do we check to be certain firefighters understand standards and application of our widely accepted safety paradigms. When we have an opportunity to embrace a series of safety paradigms that exist with order and purpose, it is truly important that we fully understand the reasons and purpose.

Each geographic area has benefited from individuals that grew up in the profession when it was young, and the workforce relied on stand-up common sense and lots of physical labor to be safe and successful. John Krebs, a Fire Behavior Analyst, and recently retired Fire Management Officer from the U.S. Forest Service, Clearwater National Forest, Idaho, is such a person in the Northern Rockies. He has for years helped us understand the application of the original Standard Firefighting Orders. I don't think many of us fully understand the reasons behind the sequence of these orders. John recently explained this process in a letter.

My interest in fire behavior, particularly in relation to fireline safety, has not diminished with time. I've had an opportunity to stay involved in fire with three fire assignments in 1996 and 1998, as well as participating in a couple of the National Fire Behavior workshops put on by the Region.

Having just finished reading Maclean's "Fire on the Mountain" I was again brought to tears at the tragic and senseless loss of those precious lives. The 1994 National FBA workshop included a visit to Mann Gulch. As we sat overlooking those 13 crosses our thoughts were that this kind of event would not happen again because our knowledge of fire behavior and our emphasis on training had greatly improved. How wrong we were! Where have we failed to make fire behavior the most important thought in the minds of our fire fighters when they are actually engaged in the suppression activity?

Looking back to my first guard school training in 1958, I recall that the “10 STANDARD ORDERS” formed the framework for much of the teaching. The people who developed those original orders were intimately acquainted with the dirt, grime, sweat and tears of actual fireline experience. Those orders were deliberately arranged according to their importance. They were logically grouped making them easy to remember.

First and foremost of the Orders dealt with what the firefighters are there to encounter “the fire.”

1. Keep informed on fire weather conditions and forecasts.
2. Know what your fire is doing at all times. Observe personally, use scouts.
3. Base all action on current and expected behavior of the fire.

Each of the ten Standard Orders are prefaced by the silent imperative “YOU,” meaning the on-the-ground firefighters the person who is putting her or his life on the line!!! My gut aches when I think of the lives that could have been spared, the injuries or close calls which could have been avoided, had these three Orders been routinely and regularly addressed prior to and during every fire assignment!

As instructors and fire behavior analysts have we become so enthralled with our computer knowledge and skills that we’ve failed to teach the basics? One does not have to be a full-blown ‘gee whiz’ to apply these Orders – they revolve around elementary fuels-weather-topography. These are things that are measurable and observable, even to the first year firefighter.

When we went out as a fire team and were ‘briefed,’ it was our responsibility to seek answers to basic questions – the first being, “What is the weather forecast?” Following that were questions concerning what the fire was doing, where it was expected to go and how was it to be confined, contained, and/or controlled. Every firefighter is entitled to ask and receive answers to these same inquiries. I should re-word that every firefighter should be “required” to ask....”

Logically following these three fire behavior related orders were three dealing with fireline safety:

4. Have escape routes and make them known.
5. Post a lookout when there is possible danger.
6. Stay alert. Keep calm. Think clearly. Act decisively.

One cannot know if an escape route or a safety zone is adequate until the Orders addressing fire behavior have been specifically evaluated.

One of the primary functions of a lookout is observing and monitoring the weather and fire behavior. How can it be that some of our most highly trained and experienced fire personnel can be on a fire such as South Canyon and not record even one, on-the-ground weather observation? Where did we as trainers go wrong? I have a nephew who jumped out of McCall. Shortly after the South Canyon tragedy, I asked him if he ever carried a belt weather kit. His answer shocked me, “Uncle John, we don’t have room for those things.” Please tell me that has changed . . . . If humidities (reference Fire on the Mountains) were as low as 11% at 2400 hours on July 5, just what were they doing on the afternoon of July 6 on the western drainage? How can a firefighter possibly “Keep informed on fire weather conditions...” without on site monitoring of relative humidities, wind, etc.

The next three 10 Standard Orders centered around organizational control:

7. Give clear instructions and be sure they are understood.
8. Maintain prompt communications with your men, your boss, and adjoining forces.
9. Maintain control of your forces at all times.

Again, if one hadn’t properly considered the first three fire behavior related orders, it would be impossible to think that Orders 7, 8 and 9 could be addressed with any validity.



The last of the 10 Standard Orders is “Fight fire aggressively but provide for safety first.” This is the only Order, which I would change just slightly to “Fight fire aggressively having provided for safety first.”

Read Maclean’s account (pg 65) concerning what should be the last order “as they chanted the ten basic fire orders in training, the first order ‘Fight fire aggressively, provide for safety first’ becomes transformed into ‘fight fire aggressively, provide for overtime first.’” I can remember helping to teach some of the fire behavior (and related) courses in Missoula and asking the participants to write down all of the Fire Orders they could recall. There were students in S-390 (and higher) who could not recall more than 3 or 4 orders!! But, they always remembered, “Fight fire aggressively....”

It was encouraging for me to learn from some first year firemen that they were required to learn the FIRE ORDERS in guard school. My fear is that this was merely an exercise in rote memory, as Maclean’s account would indicate. It’s something to chant but it is an exercise without memory.

I urge you to re-establish the original 10 Standard Orders. They were developed in a very special order of importance, grouped to make practical sense and most importantly when considered prior to and during every shift they will save lives. The 18 Situations that Shout Watch Out; LCES; Look up, Look down, Look all around; etc. are merely tools to reinforce the thought processes initiated by the original 10 Standard Orders.

If we diligently read and believe the compendium of fatality and shelter deployment investigations, you will discover the commonality of failed tactics is, they were implemented without adequate attention to fire behavior and the effects of fire behavior.

FIRE ORDERS is the sequence that was devised to assist firefighters to remember the original Standard Firefighting Orders. As John points out, the revised edition becomes an “exercise in rote memory.” The original were designed as a decision process that guided tactics and firefighter attention to fireline safety. The focus was fire behavior.

Please take the time to reconsider how you plan and implement tactical deployments, and how you manage fireline safety through risk assessment and mitigation. Use the original 10 Standard Orders, in sequence, as a decision making process and verify the standards for each component: Is the weather forecast current and applicable to where you are? Do you have current information on the fire, and can you get it? Are weather and fire predictions accurate – this part is not rocket science! Are escape routes located, timed, and trigger points established allowing for the travel times you know your people can travel? Are you certain your safety zone locations are known, sizes verified, and of effective size? Are your lookouts able to see all of the area you want monitored during times you want? Are your lookouts safe? Can your lookouts communicate, and do they know to whom, what to report and when? Do you feel confident you have enough information to safely manage your resources against the fire? Is the radio your only means of communication? Do you have the background to handle a situation of this complexity; how comfortable do you feel right now?

I share this with you because this is one of the first times I have heard the often used war cry, “back to the basics,” where the basics were explained.

May 11, 2000

Jim Steele

Northern Rockies Training Center, Missoula, Montana

## PART 2

### RPD ON THE FIREGROUND

*The following article is reprinted with permission from the April 1996 American Fire Journal.*

#### EXECUTIVE SUMMARY

We all like to believe we'd be cool, calm and capable in any emergency, but lack of experience may cause us to stumble. A recent study concluded that fireground commanders make pressure-based decisions in a most—untraditional way—and past experience is the key.

#### RPD on the Fireground

How to Avoid the

Blank Screen Syndrome

By Larry C. Miller, Ops. Chief, Deputy,  
Los Angeles County Fire Dept.

I recently took a weekend trip to San Diego. As I passed the nuclear power station at San Onofre, I found myself thinking: Wouldn't it be something to be first-in on a runaway reactor that spreads from the containment building and digs a quarter-mile hole on its 8,000-mile journey to China?

Yes, how cheated I would feel if I was off duty when the meltdown came. Can anyone identify with this?

Or say it's your first day as a new battalion chief. As you drive through your new district, you pass a refinery. You think: Wow, what if there were a fire in a cat cracker on my very first shift!

Or how about the recent train/hazmat wreck in San Bernardino County, CA? Did anyone else out there say: It sure would have been exciting to be first-on on that one—would I have dazzled my peers with some fancy footwork!

The first-due company and battalion officers that did respond to that incident may well have said: "Thank goodness I'm on duty today!" Wouldn't most of us react that way? After all, we're fully prepared.....aren't we?

Even new company officers or battalion commanders usually feel that, since they ranked high on the list and were chosen over other qualified candidates, they must be more than ready to command any emergency...right?

It's only natural that the first thing we want as new company officers or battalion commanders is to be tested so we can prove to our peers, crews and, yes, even ourselves that we have been sent to earth by God as a gift to firefighting.

Sure, there are probably a lot of things that we are gifted at when it comes to firefighting. But I just mentioned nuclear, petro-chemical and hazmat control. How about multi-casualty incidents, highrise and wildland fires, structure collapse, flooding, swiftwater rescue, USAR, civil disturbance, air crash, shipboard fires, auto extrication, bio-chemical, EMS and plain old structure fires? And of course, there's electrical—my personal favorite is fighting something I can't see.

Honestly, does anyone reading this article truly feel comfortable commanding any one of these incidents, no matter how many years of fire service experience they have? No way!

The point is that no one feels comfortable about everything the modern firefighter is responsible for knowing. The reason for this lack of confidence is that firefighting is not an inherited skill; it is not inborn. Simply put, it is acquired through experience.

None of us is born with the skills to be a firefighter. They are all learned.

Nonetheless, right from the first shift, most of us expect to perform as if it all came naturally. One of the few benefits of age—and the wisdom that sometimes accompanies it—is the ability to look back at where we came from and be honest in assessing the journey. It took me 26 years to realize and admit this.

To some, this realization will take some of the pressure off. For others, it will pour it on. Only an honest self-assessment will determine which is the case. Upon being promoted to company officer, almost everyone is scared to death. If they aren't, they should be.

Believe it or not, the best company officers and battalion commanders are at least uncomfortable for their entire career! This shouldn't be surprising, because there is plenty out there to be uncomfortable about.

Any one of the incidents listed at the beginning of this article could happen on any night in nearly any district. So how comfortable can anyone be with so much to learn and so little time to learn it?

## **RECOGNITION - PRIMED DECISION-MAKING**

In 1988, the U.S. Army Research Institute for the Behavioral and Social Sciences commissioned a study leading to Technical Report 796 from Klein Associates of Ohio. The objective of "Rapid Decision Making on the Fire Ground" was to understand how military officers make decisions under extreme time pressures when lives and property hang in the balance.

Since, at that time, there had not been a major conflict since Viet Nam, the Army wanted to know how they could best train their officers to make quick decisions

under combat conditions. First, they needed to know how quick, effective decisions are made.

After Klein Associates reviewed the different occupations that possibly share decision pressures, they found that (surprise!) fire service incident commanders face the same decision pressure on a daily basis as a military combat officer.

The study went on to examine experienced fire company officers in order to determine just how they made rapid decisions. Dr. Klein, the founder of Klein Associates, derived from these studies what he thought was a radical hypothesis: Experienced company officers did not use the conventional laboratory or university model of analytical decision-making. This involves reviewing all the pros and cons of many possible solutions to choose the correct course of action.

Dr. Klein discovered that company officers faced with an emergency incident usually didn't have enough time to completely analyze all the possible options. Instead, they invested what little time they had on sizing up the situation rather than choosing among options of what to do.

Initially, Klein was surprised to find that experienced company officers did not select from several options, but instead identified a situation as typical of

incidents they had experienced before. Then they would act on this experience by recognizing what to do without even considering a second option.

In other words, under time pressure, experienced officers produced a more "intuitive" approach to problem solving. However, few consistently selected one particular option of attack over others. Instead, they used a matching process—rather than calculation—to achieve a decision.

When faced with extreme time pressure, the officers conjured up mental pictures instead of words to compare the incident at hand to a prototype or picture they had in their minds. When a memory picture matched the incident (which the first picture did 80 percent of the time), they implemented the course of action that worked before.

If the officer encountered an incident that didn't match any previous experience, he would come up with a mental picture he thought was closest to what he was seeing. The officer would quickly play out the corresponding course of action in his mind and, if it worked, he would go with it. If not, he would mentally alter the course of action, using a process called "mental stimulation, until the problem was solved.

Dr. Klein called this process "Recognition-Primed Decision," making or RPD. To understand it, think of the

mind as holding a big slide carousel. New slides are placed in this carousel by experience, whether real or created. These slides/experiences can be drawn from later.

As a basic example, say a company officer gave an order to go to the truck and get the gas-powered smoke ejector. The crew member who received the order instantly calls up a picture of what the smoke ejector looks like. Despite the array of various equipment on the truck, he has no problem fetching the piece of equipment that resembles the picture he has in his mind. It also helps that, on the way to the truck, he pictured which compartment the ejector was in to reduce the hunt.

Obviously, even this simple slide picture was not there from birth, but put there through experience. This is the same mental process that goes on when responding to an emergency that will require tactical decision-making. The mind projects a slide picture of the closest experience to the present incident.

What all of this tells us is that we may not know how to handle all the incidents listed in the beginning of this article. It is not surprising that we may be uncomfortable attacking a fire in a nuclear reactor, a petroleum cat cracker fire or even a train derailment with hazardous materials. We simply may not

have the slides in our carousel to deal with these incidents.

So, when the new guy pulls up to that first fire and stumbles, he or she shouldn't feel bad—the slide carousel is probably not fully developed yet. This also explains why a great wildland IC may stumble at a highrise incident. His slide carousel is whirling through a panoply of wildland slides, but there's an empty section labeled "Highrise."

Returning from our first room—and—contents fire as a new company officer, most of us realized that things could have gone a whole lot better. And most of us made some decisions differently at the next fire.

Our minds can also change the slide carousel, so we can compare the last incident to the next similar incident and take action based on the experience gained. When the same type of fire occurs again, the slide carousel presents the similar picture—and the course of action that will be successful. Hence the term "Recognition-Primed Decision."

It takes skill to recognize situations as typical, and correctly using the prototypes or slide pictures is enhanced by experience. The ability to know if "X" applies is dependent on situational awareness, i.e., experience.

It is never enough to simply teach rules to a novice and expect to make him or

her an expert. For example, a sign that a roof is near failure is often described to new firefighters as a “spongy” feeling. So the first time they set foot on lightweight, panelized roof, most rookies think it’s about to fail.

In fact, what they’re feeling is the typical bounce of a good roof assembly. It will take many walks on many different types of roof assemblies and possibly many fires under an experienced company officer to supply the critical cues appropriate to roof-collapse to the new firefighter’s carousel.

## **CRITICAL CUES**

Critical cues are the signs and symptoms that help with a correct diagnosis. Examples of critical cues are those things that company and battalion officers evaluate in an initial size-up, such as:

- Life hazards
- Special population (elderly, disabled, prisoners)
- Smoke (color, amount, location)
- Fire (color, amount, location, duration)
- Structure (house, factory, office, vehicle)
- Construction (age, composition)
- Weather
- Time of day
- Resources (available, needed, special needs)
- Product involved

- Signs of structural failure
- Water supply

New officers may make “cheat sheets” or command boards to help with early size-up and decision-making, but as experience is gained, the cheat sheets are consulted less and less.

The experienced officer makes the size-up in a more intuitive way, without much active thought. If you ask the experienced officer to recite the list of what factors he/she considered, the officer will take longer to express them than a rookie will. This is because the experienced officer observes the fire and compares it to the slides in the mental carousel. When a match is found, he or she gives the correct, time-tested orders.

This is not meant to disparage the use of cheat sheets or command boards. They can serve as useful reminders of items that may otherwise be overlooked or act as an assist on incidents that are not common in the district—where the slide library may be a little weak.

In conjunction with the previous statement that the experienced officer may have trouble articulating the steps in his/her decision-making process, let me relate a personal example.

I was a paramedic for 12 of my 26 years in the fire service. I responded to dozens of full arrests, and my carousel is pretty full of relevant slides. But when it comes

time to pass the CPR exam, I have to go back and study all the “dance steps,” because the raters are more interested in the exact process I use than the outcome!

Also, the exam process very seldom resembles the sight, sounds and circumstances of a real incident. Therefore, the slides in my carousel don't relate particularly well to a hypothetical situation.

Most of us are frustrated by the annual changes to CPR procedures after some new doc decides that “X” number of ventilations prior to starting CPR are better than whatever last year's number was. And let's not forget those constantly changing compression rates. Are these process changes really better for the outcome of the patient, or are they just designed to throw our carousels out of whack?

This is why training officers should avoid getting too carried away with the exact steps in the process. Instead, concentrate on the ideal outcome of tactical objectives on the fireground.

It's okay to teach novices step-by-step methods to achieve a proper outcome, but more experienced crews need to be given performance standards that state the desired result, critical safety considerations and absolute dos and don'ts. It's better to skip the exact foot and hand placements.

So many improvements in our art can be missed if firefighters aren't given the latitude to experiment with new ways of doing things. Crews that are held to rigid step-by-step procedures for performing a tactical objective on the drillground may not take the initiative to overcome fireground problems that weren't covered in the drill manual.

## **FILLING THE CAROUSEL**

There are many worthwhile training methods that will help load the slide carousel with pertinent pictures. Examples include hands-on training and live-fire recreations where ideal actions are practiced.

Another good idea is to obtain buildings in the district that are going to be torn down and use them to practice everything from search and rescue to forcible entry, ventilation, salvage, and fire attack. (Of course, practice only ideal performance for emulation at a real incident.)

Simulators are another good idea. Simulators create the time pressure that an IC faces at a real incident. This forces RPD, the “intuitive” model of decision-making.

Success at the simulator comes from making it typical of incidents encountered in the jurisdiction. If proper mitigation is applied, the IC must “win” the exercise.



Also, read trade journals. Study fires other departments have faced, and discuss their actions. Watching videos of incidents will help stock pictures in the mental carousel. The crews should discuss them to help build better decision-making.

It is also good to train in context. This means always training in actual combat mode.

Pre-planning—“chalk talking” incidents that could occur in the jurisdiction is also helpful. Get the crew involved on every shift.

Learn from people with a full carousel—experienced people. This doesn’t just mean those with a lot of time on the job, but those who continually train to make themselves better and strive for ideal performance. These people are usually pretty easy to identify—they may even be subordinates.

Slide pictures have a tendency to fade over time, so if you don’t use them, they may not be there when they are needed. This is a most important consideration for chief officers who find themselves spending more time working in boxes than incidents. Anyone who is still responsible for commanding the Big One had better be involved with the preparations for it.

For novices: Don’t wait to fill the slide carousel with experience gained at actual incidents. This risks losing the whole carousel—and the projector with it!

Finally, please give the new guy a break! Even great ICs can be reduced to quivering wrecks when working outside their usual environment.

Most importantly of all, never be afraid to admit your carousel is empty. This is the first step to getting it filled.

*For additional reading on the subject of Rapid Decision Making, see:*

“Naturalistic Decision Making: Implications for Design,” April 1993, Gary Klein, Ph.D. Klein Associates Inc., Dayton, OH (Ordering info: CSERIAC Prog. Officer, 2255 H St., AL/CFH/CSERIAC, Bldg, 248, Wright-Patterson AFB, OH 45433)

“Decision Making in Action: Models and Methods,” edited by Orasanu, Calderwood and Zaambok. (Ordering info: Ablex Publishing Corp., 355 Chestnut St., Norwood, NJ 07648)

“Advances in Man-Machine System Research,” Vol. 5, 47-92. Greenwich, CT JAI Press, Inc.



## **PART 3**

### **INTRODUCTION TO TACTICAL ENGAGEMENT PRINCIPLES**

#### **Overview**

Over the years, authors of books on firefighting tactics have described the correlation between the fireground and the battlefield. They admit, in fact, that many of the terms and definitions used in firefighting today have their roots in military origins. To date, what has been lacking in these texts is the development of the correlation of the principles of strategy and tactics of military operations with those of their firefighting counterparts. Individual organizational elements of the fire service have adapted and assimilated military based strategy into their operations, such as hotshot crews following the strategic teachings of Sun-Tzu, but there has not been a broad based recognition of the similarities in the fire service. Although these similarities haven't been fully recognized, they certainly continue to exist.

In the firefighting world, experience in wildfire management is gained over many years. Watching an experienced fire manager organize and deploy their resources can leave the inexperienced questioning how the fire officer knew what steps to take next. For example, how did they decide to place three crews on this division versus another division, why did they attack the fire at that point and not another, and other similar tactical movement questions. What was the basis for those decisions and how were they made? Questioning those fire managers often renders a response of, "because that is the way I was taught" or "because that is how it is supposed to be done." Although the manager can explain the decision they made and why they chose that alternative, most would believe that it was based purely in intuitive decision making and few would think that there are principles that exist that they could provide to the aspiring tactician to use as an aide and basis for strategic and tactical decisions. It is interesting to note that the military version of these principles known as "The Principles of War," continues to be taught at the Navel War College, the Marine Corps University, the Army War College, and the Air Force Academy as the bedrock of military doctrine. Until now, they have not been a part of any fire service curriculum other than a cursory mention in the original S-336 "Fire Suppression Tactics" course, the one you are preparing to attend.

The purpose of this pre-course work is to introduce and explain a modified version of the "Principles of War" called the Tactical Engagement Principles or "tactical engagement principles." These principles provide the aspiring tactician with a tool

to draw on when developing their tactical plan. Many of these principles are recognized as “nothing new,” but their application and use on the fireground may not be recognized. Wildland fire training has not previously emphasized the principles behind how, when, and why *to* engage and when it is tactically advantageous *not* to engage.

**What the Principles Are and Are Not**

The tactical engagement principles are not rules or another list to memorize similar to the 10 and 18 you are familiar with. The tactical engagement principles are principles or guidelines that should be considered and incorporated when developing tactical or strategic plans. The American Heritage Dictionary defines a “principle” as “a basic truth, law, or assumption,” not as a rule requiring strict adherence. It is possible to develop a plan, engage, and fight fire successfully without considering or incorporating the principles. However, your tactical plan of action may not be as safe and certainly not as effective as it could be if the principles were considered and applied during your planning process or plan execution. The principles we will discuss are briefly described in Table #1. A more thorough description is provided as each principle is explained in detail.

<i>The Tactical Engagement Principles</i>	
<b>Principle</b>	<b>Description</b>
Objective	Tactical plans need Objectives to focus effort and clarify the mission.
Offense	Offensive action is necessary to achieve decisive results.
Mass	Sufficient firefighting power must be applied to prevail.
Reserves	Reserves provide flexibility, sustain power, and maintain momentum.
Maneuver	Tactical plans must provide necessary maneuver time to obtain position.
Security/Safety	Eliminating unnecessary risks is essential to successful tactical plans.
Position	Firefighting power should be applied to tactically advantageous points.
Simplicity	Direct, simple plans and clear, concise orders reduce misunderstanding.

Table #1

Through the firefighting simulations you will be involved in during the Tactical Decision Making in Wildland Fire course, you will see the direct application the principles have on the fireground. Indeed, you will learn how these principles interact to maximize safety and effectiveness of the firefight.

## **History**

Karl von Clausewitz first introduced the Principles of War in essay form in 1812 prior to his leaving Prussia to join the Russian army to resist Napoleon. They were further developed and documented in his book, “On War” in 1832. While the history and background of these principles is not a necessary component of understanding them, a quote from Field Manual 3-90, United States Department of Army, explains their importance:

“The nine principles of war defined in FM 3-0 provide general guidance for conducting war and military operations other than war at the strategic, operational, and tactical levels. They are fundamental truths governing combat operations. The principles are the enduring bedrock of Army doctrine.

First published in 1923 as general principles in *Field Service Regulations United States Army*, they have stood the tests of analysis, experimentation, and practice. They are not a checklist and their degree of application varies with the situation. Blind adherence to these principles does not guarantee success, but each deviation may increase the risk of failure.”

The United States Navy, Marines, and Air Force publications, Field Manuals, and the Joint Publication series from the Chairman of the Joint Chiefs of Staff echo the importance of the *Principles of War* stated by the U.S. Army manual quoted above. The use of and reference to the Principles of War is pervasive throughout all service branches at all levels.

The eight tactical engagement principles you will be learning about are based on the nine “Principles of War” described in the military publications just mentioned. Modifications were made to incorporate firefighting terminology where military terminology would not be appropriate and to adjust for the difference in missions. These modifications should be considered minor in nature and importance. Table #2 shows the relationship of the tactical engagement principles to their military

counterparts. To summarize the changes, principle number #3, *Mass*, was combined with principle number #4, *Economy of Force*. Principle number #6, *Unity of Command*, was dropped because the entire Incident Command System is based on that same principle. Principle number #7, *Security*, was renamed *Security and Safety* to clarify its purpose for firefighters. The eighth principle, *The Principle of Surprise*, was not considered as applicable to firefighting since sneaking up on a fire has little effect other than to make your co-workers doubt your sanity. Because the *Principle of Surprise* did contain some important elements, the “*Principle of Position*” was developed to incorporate those elements. Finally, a Tactical Engagement Principle, the “*Principle of Reserves*” was added to take the place of *Economy of Force* since the firefighting version of the principle of *Mass* includes the major theoretical points of the military version of *Economy of Force* except the need for *Reserves*.

The Principles of War Compared to the Tactical Engagement Principles			
Principle #	Principles of War	Principle #	Tactical Engagement Principle
1	Objective	1	Objective
2	Offense	2	Offense
3	Mass	3	Mass
4	Economy of Force	4	Reserves
5	Maneuver	5	Maneuver
6	Unity of Command		
7	Security	6	Security and Safety
8	Surprise	7	Position
9	Simplicity	8	Simplicity

Table #2

Though based on the work of Karl von Clausewitz, followers of the Chinese military strategist and sage Sun-Tzu will recognize the strong flavoring and influence of his theories and writings in the descriptions and analogies used in explaining the concepts.

### **A Note to the Reader**

This material, including the examples, is written for students who are qualified at the Single Resource Boss level and desire or need to move up to the multiple resource level of Task Force Leader/Strike Team Leader, or are looking towards becoming a Division/Group Supervisor. It is also intended for students who feel they would benefit from the principles and concepts of managing multiple firefighting resources in the logical and strategic manner this class presents. If you are qualified higher

than an SRB level you may feel the examples are too simplistic or easy – this is intentional. The objective of this lesson is to introduce the reader to the Tactical Engagement Principles. As a result the examples are kept uncluttered and easy to understand so the principle is readily apparent and clear. Extraneous details are kept to a minimum on purpose so the point does not become lost in trivial detail.

The hazard in this practice is explained by the phrase used in sports, “you play as you practice – so practice as you would play.” Skipping details or standard operating procedures in examples could, however remote of a chance it is, make people think they can skip those same steps on the fireground. Don’t even think of doing that. Consider yourself warned – just because the examples jump directly to a teaching point in no way implies that skipping any previous step in a procedure is acceptable. Although each example does not state it, every example assumes you have completed the following standard operating procedures:

- Completed your initial Situational Awareness and observation of all pertinent factors.
- Completed or given a Size-up Report to your supervisor or dispatch center as required by your agency.
- Completed an initial Risk Management Process as outlined in the Incident Response Pocket Guide (NFES 1077).

In the classroom these steps will be referred to by the letters SA-ROC-RMP. These are the first three steps in developing a tactical plan and will be explained in detail during the class. The use of the term “initial” is critically important to understand – these are ongoing processes you must continually review and modify the entire time you are on the fireground. At the multiple resource management level it is the lives of all who have entrusted you with being their IC, no matter how large or significant the fire is.

The importance of Situational Awareness (SA) cannot be over emphasized. SA must be maintained as a continuous process, constantly observing and absorbing the environment around you and using the SA data to re-evaluate the risks present and possible. While driving a car, you would never think of taking one look down the street, closing your eyes and then driving down the remainder of the street. Why? Because conditions constantly change and you lose your perspective of

where you are in relation to the street and the hazards. So why would anyone think they could get away with essentially the same idea on the fireground? Is that smart firefighting? Work to ensure that a continuous SA process is considered as a personal standard operating procedure.

## **Tactical Engagement Principle #1 – The Principle of OBJECTIVE**

*“Without objectives, tactical operations are reduced to a series of disconnected and unfocused actions.”<sup>1</sup>*

*“The purpose of the objective is to direct every [military] operation toward a clearly defined, decisive, and attainable objective.”<sup>2</sup>*

As you develop your tactical plan, or implement your own or someone else’s plan, you must ensure that all operations on the fireground (that you are responsible for) are directed at clearly defined, measurable, decisive, and attainable objectives. Objectives focus efforts on the desired result or end state. They keep everyone on the same page working towards the same common goal. If properly expressed and relayed through a briefing they help prevent freelance firefighting and unproductive effort. If assigned resources take actions that produce results that do not accomplish or contribute to the objectives, they are futile, waste time, waste the resources’ capabilities, and needlessly expose personnel to risks and hazards.

Often it may not be feasible to accomplish the desired tactical objective (TO) outright because the size or complexity of the fire makes it too difficult, logistically impossible, or tactically complex. During the initial attack phase of fires it is often a lack of sufficient resources at the scene that restricts your ability to directly achieve the objectives you have established. In that case you should establish Intermediate Tactical Objectives. If they are used, Intermediate Tactical Objectives (ITOs) must contribute toward the overall tactical objective in terms of both speed and effectiveness. The purpose of intermediate tactical objectives is to break down the desired tactical objective into smaller, more easily attainable “mini-objectives” that if added together provide the end-result of the original objective you wanted to achieve but could not for some reason. This relationship could be expressed as:

**ITO + ITO + ITO = TO**



While it can be said that in general the “ultimate objective” is control of the fire, it usually takes attaining several Tactical Objectives to successfully accomplish the “ultimate objective” of control. The control of the fire as the ultimate objective is usually not considered or used as a tactical objective because it is normally the reason why you are there to begin with. The relationship between objectives and the control of the fire could be expressed as:

**TO + TO + TO = Control of the fire = Ultimate Objective**

When developing tactical objectives be careful to not arbitrarily develop so many that you cannot keep track of them, or they become difficult or impossible to manage. Objectives should provide a framework for your actions on the incident; they should not hinder your actions or supervision, but should focus your energy. The ultimate objective is to extinguish the fire, not retire while you are waiting for all the objectives to be accomplished.

Let us look at some practical examples. As an Initial Attack Incident Commander (ICT4) on scene of a small wildland fire, you have developed an objective to stop the northerly spread of the fire by confining the fire to a ridgeline you have identified as tactically advantageous. You have determined that this objective has a priority over the other objectives because failure to stop the progression of the fire in this direction will allow it to become established in fuels that will produce fire behavior far outstripping the ability of local resources to manage it – whereby it will become a major fire. Comparing the objective with the resources at scene or due to arrive shortly, you know you do not have sufficient resources at hand to successfully achieve that objective outright. You develop several intermediate tactical objectives, one of which is to stop the spread of the fire along the first portion of the ridge up to a rock outcropping you can see. The *Principle of Objective* means that if that is one of your objectives, efforts by personnel or resources must be focused on it and not expended on other areas that do not contribute towards completing that objective, or one of the other objectives they are assigned. In other words, it would not be appropriate for a resource to be freelancing and working on another ridge they thought better. Every resource on that portion of the fire must be “on the same page,” understanding your reason and intent and contributing towards that objective.

Resources must not practice “fireline hobbies,” freelance, or work on their own plan or objectives.

It is important to note that you cannot expect resources to automatically know what your objectives are and be focused on them if you do not explain or tell them what they are. As an ICT4, just like any IC, you have the duty and responsibility to brief the resources assigned to you so they are aware of the objectives they are expected to contribute towards. Proper leadership is essential for safe and effective operations. Following through on your supervisory duties is also your responsibility. If resources are taking action contrary to the objectives, or are not contributing to the assigned tactical objective, you have the responsibility to rein them in and get them working in concert with the other resources who are working on one of the intermediate tactical objectives or tactical objectives.

The same example applies from a Strike Team Leader’s perspective. If you are assigned a certain portion of the fire to carry out an objective, then it makes no sense for one of your resources to be on a different ridge doing something else and not focused on the objective. Although this tactical engagement principle may sound simple, it is often violated. Most of the time this occurs because the resources on scene have not been properly briefed on what the objectives are, so they freelance and make their own plan with their own objectives. How many times have you been assigned to a fire and been given a task but do not know what the objective of your actions are? What if you cannot complete the task in the same manner as it was described? If you knew what the objective was you might be able to develop an alternate solution to completing the task, obtain buyoff from your supervisor, and complete it. Without knowing the objective you are forced to guess what the IC or your fireline supervisor really wanted – and that sets the stage for potential safety problems. Develop objectives – then let the resources know what those objectives are through a briefing – this simple act focuses energy and promotes safety. Remember, *“Without objectives, tactical operations are reduced to a series of disconnected and unfocused actions.”*

## **Tactical Engagement Principle #2 – The Principle of OFFENSE**

*“Invincibility lies in the defense; the possibility of victory in the attack. One defends when his strength is inadequate; he attacks when it is abundant.”<sup>3</sup>*

*“A defensive posture should be only a temporary expedient until the means are available to resume the offensive. Even in the conduct of a defense, the commander seeks every opportunity to seize the initiative by offensive action.”<sup>4</sup>*

In firefighting, offensive action is essential to achieve decisive results or turn the course of the incident. You cannot control a fire while in a purely defensive mode; you can only attempt to minimize the resulting damage. The wind driven wildland fires of southern California are excellent examples of being forced into a defensive mode. There will be individual areas where offensive action is taken when the fire behavior lessens and permits a mode shift to the offensive. However, during a majority of the wind driven fire, the extreme fire behavior forces the IC and the resources to commit to defending structures trying to minimize the resulting damage. This also frequently occurs during IA, where the initial resources are insufficient to operate in the offensive mode, forcing the ICT5 into a temporary defensive mode. While in a purely defensive mode you cannot control the fire. The fire may control itself by running out of fuel, which may have to be your plan on certain extreme fires, but again you are then forced to deal with the resulting damage. Usually there is a point in time and place where you can engage and make a difference.

There are several aspects within the Principle of Offense.

- Even if the capability of your firefighting force is overwhelmed by the fire’s magnitude or intensity, at some point in time, with an emphasis on it being the correct time, you will need to engage and take offensive action if you are going to control the fire.
- Fireline supervisors should adopt the defensive mode only as a temporary measure and must seek every opportunity to switch to an offensive mode. Therefore, while in a defensive mode, always look for a tactical weakness in the fire; be it misalignment of forces, fuel change, or some other reason. Have a plan for when that weakness presents itself so you can take advantage and capitalize on it.

- It is common for there to be both offensive and defensive actions simultaneously occurring on the same fire.
- Fireline supervisors assume the defensive mode to compensate for a weakness. This does not mean weakness of the supervisor's ability or resolve to fight fire, but one of less capability than required for safe and effective firefighting operations. There will be times when you are "outgunned" by the fire. That is OK, it happens – sometimes a lot. Know the limitations of your personnel and resources and respect them. There is a time to fight and there is a time to wait and look for a better opportunity or a tactical weakness in the fire. Do not commit your resources to an impossible or unsafe task or tactical objective just because you think, "something needs to be done." You are correct; something does need to be done. Remember though, it may not be the right time or the right place to be doing it. The principles of *Timing*, *Mass*, and *Position* should assist you in determining your course of action.

In summary, purely offensive action can be taken only when there is sufficient firefighting capability immediately available, the fire behavior is within tactical limitations of the resources, and it is safe to do so. If a defensive mode is required or forced, so be it, but every opportunity must be sought to obtain or regain an offensive advantage or mode. In other words, always look for indications that the fire behavior has weakened or lessened in some location where it would be advantageous to go offensive. Also remember that any action taken should be complementary towards the objective. Finding a place to go offensive, any place, no matter the significance or worthiness, does not buy you much either. You need to find a tactically advantageous spot to go offensive, not just any old spot. You have limited resources, place them in a position that counts.

It is equally important to remember that the Principle of Offense should be viewed as a two-way street. Just like you should always be looking for opportunities to go offensive, you must always be looking for indications that you may need to shift to the defensive mode. These indicators may be from increased fire behavior, deteriorating environmental conditions, or any of a number of factors. It is extremely important that you establish and maintain Situational Awareness of the environment, the incident, and its effect on the environment in order to detect these indicators in time to be proactive rather than reactive to the situation.

Let us look at some practical examples. You are an Initial Attack Incident Commander (ICT4) on scene of a small wildland fire along with a 10-person crew and a Type 6 engine. The fire has established itself at the base of a moderately steep grassy (fuel model 1) slope, is about two acres in size, and is rapidly spreading and spotting uphill. You can see a home at the top of the slope with very good defensible space surrounding it, but it will require an engine for protection from roof and spot fires. It is your agency's policy that you will provide structure protection on wildland fires. Your tactical objectives for this fire are: 1) to provide for defense of the structure and, 2) limit the fire spread to the slope it has established itself on. Your thought is that you have insufficient resources to simultaneously provide for structure defense and a flanking action on both sides of the fire at once, so you choose to defend the structure and engage the one flank of the fire that appears to have the greatest spread potential. Based on this example are you taking offensive or defensive action – or both? The structure protection is obviously a defensive mode, but engaging the fire on the one flank is an offensive action – you are simultaneously in both offensive and defensive modes.

The example shows that you can and usually will be in different modes on different parts of the fire at the same time.

In a second example, a Strike Team Leader of Type 2 (medium) dozers has been assigned to construct direct line on a division consisting of heavy brush transitioning to grass. The fire behavior in the brush has been active with flame lengths of 15-to-20 feet with short range spotting. The observed fire behavior has kept the dozers from being able to make any significant headway and essentially forced into a defensive mode. The strike team leader is anticipating a fire behavior change when the fire transitions into the grass. She is aware that the rate of spread will significantly increase, but anticipates the flame lengths to moderate. With the *Principle of Offense* in mind she repositions her assigned dozers to work where they can while the fire is in the brush, progressing where the fire behavior moderates (a weakness in the fire), and working them into a position to take advantage of the anticipated fire behavior change when it occurs.

In this example the strike team leader was forced into a defensive mode due to fire behavior. Considering the *Principle of Offense* she looked for a tactical weakness in the fire, took advantage of it, and tied that action into being prepared for taking advantage of a more permanent fire behavior change when the fuel type changed.

### **Tactical Engagement Principle #3 – The Principle of MASS**

The *Principle Of Mass* represents the concept that an “effective force” must be concentrated at the critical time and place to obtain the desired results or maintain the offensive. The term “effective force” is a key to the principle because “effective” does not necessarily imply large numbers of resources, but firefighting capability or power. Effectiveness is achieved by synchronizing and integrating resource capabilities where they will have the most decisive effect in the shortest period. Massing the effects of firefighting power through this approach rather than by merely concentrating numbers of firefighting forces can enable even numerically smaller forces to achieve decisive results.<sup>5</sup> The concept behind synchronizing and integrating resource capabilities is to utilize the strength of one type of resource to overshadow the shortcoming of the other. Examples include using a dozer to cut line in heavy brush that is slowing down a hand crew, but pair it up with a hand crew to clean-up, fire-out and hold the line the dozer can cut but can’t hold easily. Another is to utilize helicopter water drops to reduce flame lengths enough so a hand crew can work effectively on the edge, increasing the effectiveness and safety of a resource that may not otherwise be able to be used. Learning which resources work best with each other is usually gained through experience. Unit 3 of instruction in Wildland Fire Suppression Tactics, covers many elements of combining resources to achieve this synergistic approach.

To properly understand the Principle of Mass there are several points that need to be clarified.

- You may be faced with the decision whether to deploy a less than optimally effective force on both flanks of the fire or deploy an effective force on only one flank in order to take advantage of the Principle of Mass.
- The decision to employ the Principle of Mass requires strict economy and the acceptance of risk elsewhere.<sup>6</sup> Not staffing a flank or other portion of the fire requires that you prioritize the Tactical Objectives you have formulated and accept some level of risk on the understaffed or unstaffed portion of the fire. The best situation is to be able to concentrate on your priorities while covering your bases.

- The term “Economy of Forces” must be a sideboard to the Principle of Mass. The idea if “one is good, two is better, and three must be even better” should be looked at very cautiously. Resources must be used to their maximum advantage and not worked at marginal or low capacity. The presence of any duplication of effort must be avoided. Firefighting power must be concentrated at the decisive place and time to achieve decisive results, but it should not be squandered either. As an example, as a Division Supervisor you should be asking yourself questions such as, “are these crews assigned to the same area as this dozer really being effective or is there a more effective place for the crew?”

The Principle of Mass, simply stated, is deploying a force sufficient to make an effective attack that overpowers the strength of the fire with the minimum number of resources. You can help minimize the number of resources required to accomplish this task by utilizing different combinations of resources that strengthen each other and make up for each other’s weaknesses. Although this principle will provide more effective and safe operations, there will be a potential risk if you are unable to adequately staff all flanks or portions of the fire at once.

## **Tactical Engagement Principle #4 – The Principle of RESERVES**

One of the more difficult principles to incorporate into your tactical plan during the initial stages of an incident is the Principle of Reserves. Although initially difficult to achieve, the principle is still an important part of a sound tactical plan. There are two types of reserves: tactical and strategic. A tactical reserve is used to lengthen the ability to engage or fight fire. A strategic reserve is used to take action on unforeseen events, like a spot fire. When you have the luxury, resources should be held in reserve to be placed into action as needed. As an ICT4, a strike team leader, or a task force leader it is more likely that you will be dealing with reserves from a strategic standpoint.

Strategic reserves can be created by the act of identifying an engine in a strike team or a squad in a crew that can be pulled off their current assignment and used to take action on a spot fire or breach in the line. If you were assigned as an engine strike team leader working in a firing group, the simple act of assigning one engine for firing, three for holding and then keeping one in reserve for backup is honoring the Principle of Reserves. It does not imply that they have to sit idle while the other resources work. It means they should be notified, briefed, and understand that they are considered as a reserve and should attempt to remain in a position to immediately respond to a request for assistance. On larger or more complex incidents (Type 2 or 1) you may find yourself being placed in a staging area for the purpose of being either a tactical or strategic reserve. Incorporation of the Principle of Reserves should be determined by the situation. A simple situation not likely to get out of hand can tolerate a small reserve. The more critical or complex the situation the more a reserve becomes necessary to ensure a successful operation.

Committing resources to a reserve is an overt act that must be thought out carefully. If resources were scarce you would not commit resources to reserve at the expense of the Principle of Mass. It would be better to have an effective force on the line and no reserve than a reserve force standing by while an ineffective force is struggling on the line.

The Principle of Reserves should not be confused with staging resources because there is no assignment for them or the IC is unable to keep up with the amount of resources arriving on an incident.



Some of the other guidelines for the Principle of Reserves include:

- Ensure the reserves are in a position to readily reinforce the tactical objective they have been identified for, since their effectiveness would be lost if their maneuver time exceeded the window of opportunity for their use. This is discussed later in the Principles of *Position* and *Maneuver*.
- Reserves should be employed to exploit success, sustain an attack or used to apply the *Principle of Mass* – not to reinforce failure. If you are considering committing reserves to a situation that is deteriorating, you should immediately initiate a review of your SA-RMP to ensure the safety of the personnel involved prior to deploying more resources. You must be able to recognize a losing battle and be prepared to disengage if necessary.
- Reserves should be committed in a sufficient force to ensure success. They should not be piecemealed or drawn into a losing situation. If you can, commit enough reserves to turn the course of the incident using the guidelines of the *Principle of Mass*.
- If you have the luxury of resource availability, when reserves are committed a replacement reserve force should be obtained. Also consider the advantages of holding reserves for a night shift, when changes in weather and/or fire behavior may offer significant tactical advantages.
- The use of aircraft as a reserve should be looked at very cautiously. The risk, exposure, expense, and likelihood of being able to utilize them if the situation necessitated it are all important considerations. The orbiting airtanker may provide you with a false sense of security. The same wind that pushed the fire over the line may bend the smoke column over and obscure the area where they may be needed – rendering them unable to provide you with the reserve capability you thought you had. While it might be prudent to consider air resources as a part of the reserve you develop, you should not base actions on the thought that they are your only source of reserve.

## Tactical Engagement Principle #5 – The Principle of MANEUVER

The Principle of Maneuver describes the movement of resources to a strategic point where they can take advantage of an opportunity, like a change in fire behavior resulting from a change in fuel type. This principle is not directly concerned with where you move the resources to since that is covered in the *Principles of Position* and *Objectives*, but how, when and indirectly what is moved. Incorporating this principle into your tactical plan is accomplished by considering the time and difficulty required to complete a planned maneuver to get the resources in place and to allow extra time to account for snags and delays. This will require you to forecast the situation far enough in advance for effective action to be planned, movements to occur, and resources to set up for taking action. The maneuver must be completed prior to losing the window of opportunity or before the fire gets into a position where it gains the advantage you sought to prevent. Not considering or “honoring” this principle often leads to entrapments or burnovers. It is the same concept of making sure that you have sufficient time to use your escape route under LCES. Just like you do not want to run out of time part way along your escape route, you do not want to run out of time and not be in the correct position to engage the fire. As an example, if you were assigned to protect a structure from an approaching wildland fire, you need to plan for sufficient maneuver time to make it to the structure, set up, and be ready for the fire’s approach. Not paying attention to or underestimating the maneuver time may leave you in a dangerous position in between your original position and the safety of the structure with defensible space. The results of being caught in between starting and ending positions is well documented in the South Canyon, Sadler, and Calabasas fires to name a few.

Considerations of the Principle of Maneuver include:

- What is the time limit for completing the job? Examples include considering how long will it take to move resources into position, how long will it take for the resources to complete that section of line, and how long will it take for them to be in a place of safety? Time delays and snags in the tactical plan need to be thought out and discussed to cover common and uncommon events that might impede progress.
- Are there enough personnel and machines to accomplish that job within the time limit? Have you been realistic with estimating production rates, resource capabilities, and the *Principle of Mass*, or are you being too optimistic and setting yourself up for failure?

- Have you considered the limitations of the resources you are planning on moving? Can the planned travel route handle the maneuver with the equipment you are using? What about impediments like residents leaving and blocking roads, restrictions on bridges, clearances, and maneuverability of the equipment?

The Principle of Maneuver also plays a role in other principles. One of the considerations under the *Principle of Reserves* is, “Ensure the reserves are in a position to readily reinforce the tactical objective they have been identified for, since their effectiveness would be lost if their maneuver time exceeded the window of opportunity for their use.” Remember, it doesn’t matter how good your plan was – if the resources arrive after the fire has gone by, chances are it is not that good a plan anymore.

## **Tactical Engagement Principle #6 – The Principle of SECURITY and SAFETY**

*Sizing up opponents to determine victory, assessing dangers and distances is the proper course of action for military leaders.<sup>7</sup>*

*Risk is equally common to action and inaction.<sup>8</sup>*

The Principle of Security and Safety seems simple enough. The importance and emphasis on safety can be seen on a daily basis in the textbooks, Fireline Handbook, Incident Response Pocket Guide, and daily correspondence. The phrase, “Safety is our number one priority,” indicates the level of commitment all fireline supervisors and managers should have to promote and provide as safe an operation as possible

The Principle of Security and Safety does not, however, imply undue caution and avoidance of calculated risk. It is impossible to avoid every risk present because risk is common in both action and inaction. Security and Safety is achieved by establishing and continuing measures to protect personnel from undue risk. It is achieved by developing a tactical plan that avoids any unnecessary risks not related to the objectives. It is achieved by developing a tactical plan that recognizes and communicates the risks inherent in the operation to all responsible fireline supervisors and to make sure they are maintaining their Situational Awareness and completing their own Risk Management Process (RMP). The steps outlined in the RMP section of the IRPG are an excellent tool for fireline supervisors to identify, examine, analyze, and mitigate the risks that could jeopardize firefighting personnel. It cannot eliminate every risk there is, since even standing there presents a risk, but what it does do is provide the security that is essential to the safety of firefighting personnel.

*Risk management is not an add-on feature to the decision making process but rather a fully integrated element of planning and executing operations.<sup>9</sup>*

“During the mission, [fireline] leaders continuously monitor controls to ensure they remain effective. They modify them as necessary. Leaders and individuals anticipate, identify, and assess new hazards to implement controls. They continually assess variable hazards such as fatigue, equipment serviceability, and the environment. Leaders modify controls to keep risks at an acceptable level.”<sup>10</sup>



Incorporating the Principle of Security and Safety into your tactical plan means that you develop your tactical plan in and through a Risk Management Process. You examine the plan as it is being thought out and developed to identify and assess the hazards each tactical objective, intermediate tactical objective, and operation has, and then you design in mitigating controls into your plan to eliminate any undue risks involved. Then, through a thorough standardized briefing process, you communicate the risks inherent in the operation to all responsible fireline supervisors and make sure they are maintaining their SA and completing their own RMP. Once these controls and evaluation processes are in place, the tactical plan will provide the framework for the safe and effective engagement of the fire.

## Tactical Engagement Principle #7 – The Principle of POSITION

“Tactical units must be in the correct position to act at the proper time.”<sup>11</sup>

In the *Principle of Mass*, it was stated that an effective force must be concentrated at the critical time and place to obtain the desired results or maintain the offensive. The Principle of Position refers to the Place that force is applied, since it does no good to mass an effective force on a section of fire that has burned itself out or holds no significant value to achieving the objectives you have set. The position you choose to place resources should be directly related to the tactical objectives that need to be attained. These positions are sometimes referred to as Decisive Tactical Points (DTPs) because attacking or controlling the fire there can give you a decisive tactical advantage or prevent the fire from gaining a tactical advantage on you. There are three points to consider about the Principle of Position:

- Prior to deploying resources to take advantage of the Principle of Position, the capabilities of the personnel and equipment must be realistically considered. Attempting to place a two-wheel drive engine into an area where four-wheel drive is required not only wastes the resources but also may potentially create an unsafe or dangerous condition. The same would be true if you placed an inexperienced Type 2 crew in a position appropriate only for a hotshot crew.
- Position is just as important when in the defensive mode as it is for offensive mode. Defensive modes such as structure protection rely heavily on being able to position yourself in a defensible space. Personnel must seek the best location for protection while still providing access to critical areas of the structure to prevent its ignition.
- Limited resources will require that you prioritize the Decisive Tactical Points you are able to attack, especially if you incorporate the *Principle of Mass* into your tactical plan development. This requires skill in not only determining which priority is more important but also if you have sufficient resources to make an effective attack at that position.

As an example: You have identified three Tactical Objectives critical to your operation but you do not have sufficient resources to accomplish all three. Your number one objective does not lend itself to being broken down into intermediate tactical objectives and you do not have sufficient resources to achieve the *Principle of Mass* on it. In this case it may be better to delay working on priority number one and look at placing your resources on the second highest priority if you have sufficient resources to achieve Mass on that one. The questions you will need to answer are, “Is it better to accomplish your second priority than to only partially accomplish your first priority,” and “Are you in position to be able to?”

A previous example used to demonstrate the *Principle of Offense* also included the *Principle of Position* in it. The example stated, “With the *Principle of Offense* in mind she repositions her assigned dozers to work where they can while the fire is in the brush, progressing where the fire behavior moderates (a weakness in the fire), and working them into a position to take advantage of the anticipated fire behavior change when it occurs.” Remember, “Tactical units must be in the correct position to act at the proper time.”

### **Tactical Engagement Principle #8 – The Principle of SIMPLICITY**

The Principle of Simplicity presents the concept that direct, simple plans and clear concise orders reduce misunderstanding and confusion. Simplicity contributes to successful operations because there is a reduced chance for misunderstanding and misinterpretation. Other things being equal – the easiest plan is the usually the best.

*Because we can never eliminate uncertainty, we must learn to fight effectively despite it. We can do this by developing simple, flexible plans; planning for likely contingencies; developing standing operating procedures; and fostering initiative among subordinates.<sup>12</sup>*

When developing your tactical plan, avoid the impulse to develop an ornate plan or one that is difficult to explain. Remember that those around you have differing levels of experience, education, and concentration. Also be mindful that the fireground is fraught with distractions that make it difficult to listen to every detail of a complicated plan. Every distraction from an air tanker overhead, to the noise from a pump, to a landowner trying to get your attention, works against being able to explain each detail necessary in a complicated plan. Keep the plan simple, explain it in simple concise language, ask for questions, obtain feedback, and make sure you use a good briefing format.

## ENDNOTES

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2. Karl von Clausewitz, *On War*, trans. and ed. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1984).
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4. FMFM-6. Fleet Marine Force Manual 6, "Ground Combat Operations."
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9. General Dennis J. Reimer, Chief of Staff, United States Army. 27 July 1995.
10. FM 10. U.S. Army Field Manual 10, Risk Management. 23 April 1998.
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## PART 4

### LEVELS OF ENGAGEMENT AND DRAW-D



#### USDA Forest Service National Wildland Fire Operations Safety Decision Support Briefing Paper

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Date: March 19, 2003

**Topic:** Levels of Engagement and DRAW-D

**Background:** In response to the Thirtymile tragedy the term “disengagement” was added to the wildland firefighting lexicon. As with many well-intended actions in response to identified needs, application and meaning of the term were all over the map. In the most severe of misinterpretations “disengagement” resulted in abandonment of suppression objectives by on-scene firefighters, rather than a shift in the level, breadth, or focus of their efforts. In order to clarify and emphasize the original intent, i.e. thoughtful and mindful decision-making and action in response to changes the environment and the associated risk and exposure, an alternative descriptor is necessary.

**Key Points:**

- As with military field actions, there are only five things we can do in firefighting. We'll call them *LEVELS OF ENGAGEMENT*... defend (holding actions, priority protection areas), reinforce (bringing more or different resources to bear on the issue), advance (anchor and flank, direct or indirect attack), withdraw (move to a safety zone or otherwise cease current activities until conditions allow a different level of engagement), or delay (waiting until the situation has modified sufficiently to allow a different level of engagement). The Marine Corps calls this *DRAW-D*.
- *DRAW-D* concurrently applies to actions on segments of line, Divisions, or the incident in its entirety.
- *DRAW-D* applies to the levels of fires we fight, i.e. initial attack, extended attack, large fires, and “mega” fires.
- *DRAW-D* presupposes every action on or in response to an incident represents a level of engagement. Safe and effective firefighting requires a bias for action, realizing every tactical maneuver is predicated on thoughtful, mindful decision-making. In this model, accurate situational awareness, rapid and pinpoint risk identification and mitigation, and effective decision-making are essential.

**Decision to Be Made:**

Whether or not to introduce *LEVELS OF ENGAGEMENT* and *DRAW-D* in the firefighter lexicon, and pursue incorporation of the concept into firefighter training in general.

**Recommendation:**

Firefighting requires a bias for action. The environment is dynamic, risk-filled, and consequence severe. Every tactical action should be predicated on prompt hazard recognition and rapid decision-making. In this model “can-do” is incorporated in every level of engagement, and every level of engagement is equal in value to the overall effort as the other. Understanding this premise serves to channel firefighter cultural “can-do” bias toward effective, safe actions. It also serves to highlight the fact that any level of engagement or action requires a conscious decision based on the situation at hand or eminent. Withdrawal is not a stigma, but a decision. Delay is not a lack of effort, but a wise choice to maximize long-term effectiveness. Reinforcement is not a sign of weakness, but an indicator of savvy risk management. Adoption of *LEVELS OF ENGAGEMENT* and *DRAW-D* will help get our firefighters to the point of making the right decision, at the right time, with plenty of time to act.

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## Levels of Engagement

- Defend** Hold and improve the line.
- Reinforce** Add resources necessary to *advance* or *defend*.
- Advance** Direct or indirect attack or active burnout operations.
- Withdraw** Abandon constructed line or established position in response to fire behavior or other influences adversely affecting the ability to *advance* or *defend*. This may or may not include travel along safety routes to safety zones.
- Delay** Wait for conditions to meet pre-identified triggers necessary to *advance* or *defend*.