

MECHANIZED EQUIPMENT TACTICAL USE CONCEPT OF OPERATIONS

Concept of Operations is a military term that defines the fundamental principles planners use to develop and implement a tactical plan. That is how "a set of capabilities may be employed to achieve desired objectives or end state".

We are in an era of innovation by equipment manufacturers and logging industries. We now have a variety of machine types, models and capabilities based on hydraulics, horsepower, tread and track design, working attachments and operator skills. Machine evolution has exceeded our knowledge base in wildland fire management by decades.



Crawler tractors, or dozers, were first introduced on fires in the 1940s. Use of mechanized equipment (heavy equipment) for wildfire suppression increased slowly following the late 1980s. Heavy equipment demonstrated their potential during the late 1980s and early 2000s because of tactical resource shortages. Mechanized equipment is common today and appears on the Virtual Incident Procurement (VIPR) internet site as contractor resources for wildfire suppression.

We do, however, continue to have problems with how and what to order from the incident and dispatch, as well as how to organize and use the equipment when it arrives. Although a more common resource on fires today than years ago, we experience a dwindling base of contractors willing to participate in this profession and overhead staff to plan and supervise equipment use. Being able to turn a profit in a marginally productive economy is essential for contractors, while safety and production efficiency are paramount to meet state and federal regulations, to meet land management objectives and to hold down workman compensation insurance rates.

Ordering suppression resources is tied to the incident tactical plan; for that reason we need to work through the plan to construct the equipment order. As a tactical resource, mechanized equipment should meet time and space requirements set by the incident Operations Section Chief. The Tactical Plan must incorporate the Concept of

Operations for using all resource types. The following eleven principles, derived from the Concept of Operations, guide use of mechanized equipment on wildfire incidents.

1. Use machines in a manner that fits their design and function.

This applies to Single Resources, or combinations such as Strike Teams and Task Forces.

A high percentage of mechanized equipment use is for fireline and fuel break construction, the sequencing of machines into task forces would resemble those of a logging side. This allows operators to design their traffic flow as they normally would to avoid travel conflicts and down time.

2. Use the right tool for the job.

A considerable amount of wasted time, energy and money is caused by the wrong machine being used, or the wrong attachment being on the right machine. This usually becomes an ordering issue, and puts fire managers in a bind to correct the mistake if they realize it.

What often happens is we tolerate what we created, rather than spend the time to rectify it. We will alleviate delays and unwarranted expenses if we order the correct machine/s the first time.

3. Do it right the first time.

One of the best ways to contain higher costs anywhere is to do it right the first time. The cost of doing business is expensive when using machines. Costs can be controlled with the right equipment ordered and received, and proper overhead in-place to monitor production, fireline location and assure fuelbreak and fireline standards are met.

4. Use the power of hydraulics to your advantage.



Hydraulics is a proven technological advantage for accomplishing heavy weight jobs that may last for long durations. Mechanized equipment does not use auxiliary power to run its primary working parts. Equipment manufacturers and logging industries have created improvements for faster actions and maximum delivery of power to their attachments. Machines cannot work everywhere. Mechanized equipment provides one solution to effectively

meeting fire management objectives when working within their designed capabilities.

A High Reliability Organization (HRO) is mindful for points of weakness in tactical plans. Weak points indicate where the potential for a small or large failure may

occur that could threaten the success of the operation. Managers in HRO will often ask themselves, "How could this plan fail?" They force themselves to game the plan for weaknesses. When you have decided to execute your Tactical Plan, and are feeling good about what you have so far achieved, ask "Is there a more efficient and safer way of doing it?" This question alone may lead you to consider mechanized equipment rather than traditional manual labor.

- 5. Rely, where you can, on mechanized equipment to contain and stabilize the fire, and use firefighters to put the fire out.**



Stabilize an expanding incident using an organization that can react quickly, strike with power, be minimally affected by fatigue, and can create a work environment that is safer for firefighters. This principle relies on the concept of creating an attack force whose energy will exceed the current energy of the fire. A well organized and led taskforce will create that using cutting, digging, moving, and remote water supply as a strike force

to overcome time and distance challenges. This is the same principle used when deploying aerial resources, only applied to ground forces.

- 6. Do not mix crews with mechanized taskforces while building progressive control lines or during night operations.**

Mechanized taskforces are designed to keep the cutting machines moving forward. Skidders, skidgines and mulchers follow cutting machines and loop back for various fuel management tasks, e.g. move trees to storage areas or decks, mulch surface fuels, patrol control lines and watch for spot fires. Rapid machine movement -back and forth and crosswise- creates too much risk of injury to firefighters other than the HEQB, who carefully position themselves ahead of the equipment and have direct contact with equipment operators.

- 7. Provide more intensive onsite management (HEQB) during stabilization (fireline security) and control (mop-up).**



These are periods where ground forces are the key to holding control lines and putting the fire out. At this stage, mechanized taskforces may be separated into single resources, or spread out over a large area and assigned more stationary work than progressive construction. At this stage, more onsite management is required to assure no conflicts occur between ground crews and equipment. Greater problems can occur if the equipment stops working because mechanized

advantages are no longer being used.

8. *Understand Incident Rhythm to avoid conflicts.*

Mechanized equipment may be working two operational periods per day, including a full night operational period or a swing shift. Conflicts and delays may be created by coupling off-shifting with uncoordinated logistics needs, road use to the fire area from staging areas, operational period briefings and debriefings for additional shifts also taking place onsite, and generally servicing the normal operational period for ground crews. Incident Rhythm may involve using combinations of off-shifting that do not conform to our traditional uses.

9. *Mechanized taskforces may be used sequentially through multiple divisions for control lines construction.*

One mechanized taskforce may start on Division A and progress through Divisions B and C. As control lines are constructed ground forces and additional equipment move in for stabilization and containment. Selection of this tactic is based on multiple factors, e.g. time required to construct, space or control line standards, availability of the right equipment and relief operators, adequate field oversight (HEQB and TFLD), and similarity in tasks, terrain and vegetation between Divisions. This kind of Equipment Group relies on good planning and support for logistics needs, ground use oversight, as well as company support for relief operators and possible lowboy staging.

10. *Continuity of Operations represents machine types that can be used through all phases of the fire, including initial attack, progressive control line construction, offensive and defensive tactics, incident stabilization, mop-up and reducing move-out costs.*

Use the same equipment through the life of the incident, minimizing moving with additional move-in and move-out costs. This principle offers managers a variety of use options without demobilizing equipment and replacing them with another machine type. Moving on-site equipment within the fire is still less expensive when compared to demobilizing one piece and replacing it with move-in and move-out costs of a replacement.

11. *All phases of incident complexity require adequate planning to assure proper use, safe access to fire areas, continuity of operations, synchronization with incident rhythm, and providing timely logistical support.*

Avoid wasted time, equipment use and money by proper strategic planning. Coordinate members of the Incident Management Team to address their concerns and observations while mitigating risks. This is best accomplished by having a central management position knowledgeable with using mechanized equipment that can help with strategic



and operational planning. They would also provide technical assistance with Operations overhead for the day to day use and planning for progressive use of equipment.

USE THE RIGHT TOOL FOR THE JOB

It is imperative to have the right machines with the right attachments in place and to follow these standard operating principles:

- Fireline and fuelbreak standards are the backbone of success. The type and widths of both fuelbreaks and firelines are very important as they cannot be reconstructed during the fire fight. Get it right the first time.

These specifications should be detailed in the Tactical Plan and briefed to those managing the equipment. Create the right conditions for the job and avoid guesswork. Intent statements should give discretionary authority on-site managers to add to the project, not diminish its standards.

- It takes longer to complete the job to standard with underachieving machines, and leads to delays due to breakdowns.
- Ordering the right machines will accommodate control line construction and risk mitigations, based on obvious and recurring hazards that need to be identified in the Tactical Plan.
- Quality overhead (HEQB and TFLD) will know control line standards and intent from which to make necessary adjustments in the control line to accommodate change. They will know how to deal with debris, how to physically place slash and the potential for wood products.

Quality overhead know that control line standards are based on expected and observed fire behavior, and that tactics selection are affected by surface rock, control line width weakness due to saddles and tops of draws and stream courses, and fuel type changes.