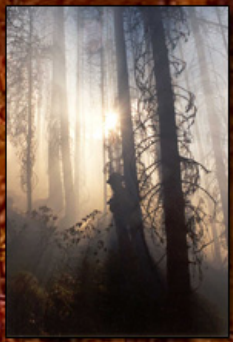
Comprehensive National Strategy

for Use of Aviation Resources in Wildland Fire Management

November 2006

Fourth Draft



Contents

I. Introduction

National Aviation Doctrine

- Aviation resources are one of a number of tools available to accomplish fire related land management objectives. Use of aviation resources has value only if it serves to accomplish the mission.

- In order to maximize effectiveness and efficiency, aviation resources must be centrally controlled and aviation operations must be locally executed.

- Aviation resources very seldom work independently of ground based resources. When aviation and ground resources are jointly engaged, the effect must be complimentary and serve as a force multiplier.

- The effect of an aviation resource on a fire is directly proportional to its capacity and to the speed with which it engages the fire. Effects of speed and capacity are magnified by proper prioritization, mobilization, positioning and utilization.

- Aviation use must be prioritized based on management objectives and probability of success.

- Risk management is a necessary requirement for the use of any aviation resource. The risk management process must consider the risks to ground resources and the public, and the risks of not performing the mission, as well as the risks to the aircrew.

Strategy Background

This document represents the second phase of the comprehensive effort to develop a national strategy for the organization, procurement, and management of aviation resources utilized in wildland firefighting. A broad strategy regarding the acquisition and use of wildland fire aviation resources over the next 15 to 20 years by federal wildland firefighting agencies was the focus of the first phase of the comprehensive national strategy. These agencies include the United States Forest Service (USFS), Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), National Park Service (NPS), United States Fish and Wildlife Service (FWS), Department of the Interior (DOI) Aviation Management Directorate (AMD), as well as State and Military Partners.

The second phase of the comprehensive national strategy effort focuses on refinement of the initial broad strategy. This effort includes more specific definition of the issues facing federal wildland firefighting agencies, and development of recommendations to improve organization, procurement, and management approaches across all of the agencies. While the recommendations primarily focus on federal aviation assets, this phase of the effort includes strategies for better incorporating available state aviation assets into the national picture.

Elements of the second phase of the comprehensive national strategy effort are presented in the following sections of this document. The third phase of the effort will focus on development and deployment of an implementation plan for the national strategy.

II. Statement of Strategy

Current Strategic Environment

Accumulation of wildland fuels, widespread drought and measurable climatic changes have combined to increase the number and severity of wildfires occurring annually. Rapid population growth and infrastructural development in rural areas, and the associated risk to populations and property, have significantly increased the complexity of these wildfires. This complex and high risk operational environment demands a comprehensive national aviation strategy.

National Aviation Strategy

This document presents recommendations for the comprehensive national aviation strategy. It provides long term strategic direction for how federal aviation resources, in an interagency manner, will be procured, operated and managed of the next 15 to 20 years. The strategy will help ensure a safe, efficient and sustainable national aviation program. The strategy will also help federal agencies respond successfully to the challenges of a rapidly changing wildland fire environment that is being affected by climatic and social changes, and to rising aviation operation costs.

Aviation resources are strategically important to national wildland fire management issues. Aviation resources are comprised of the aircraft, pilots, support personnel, and air attack bases utilized by federal and state firefighters and resource managers. Delivery of suppressants and retardants by large air tankers, single engine air tankers, water scoopers, and helicopters, and delivery of firefighters by fixed and rotor wing aircraft are essential tools for fire managers. Availability of a wide variety of aircraft types is indispensable to successful fire suppression in different terrain, fuels, and site conditions.

Aviation resources perform exceptionally well during field operations despite the lack of standardized aviation business management practices among federal agencies. Nationally standardized aviation business practices, including all aspects of contracting, acquisition, and management, that are applicable to all participants (contractors, federal agencies, and state agencies) are critical to a comprehensive and effective national aviation management strategy.

III. Foundation of Strategy

The following topics provide an understanding of the foundation of the comprehensive national strategy.

Future Operating Environment

The wildland fire operating environment over the next decade or more is expected to see a general increase in fire occurrence, size and severity. These wildland fires will be more complex, with more fuels, and present a higher risk to the public and firefighters. This increase is largely due to historic accumulations of fuel, apparent changes in weather patterns, and increasing human development in fire-prone wildlands. This last source, increasing human development, has already converged with weather patterns to result in many more fires having to be fought at the wildland-urban interface.

A number of positive developments have occurred that may lead to mitigation of some of these issues. There has been a concerted effort to treat fuels and reduce fuel loadings. There has also been a shift in the overall approach to wildland fire suppression in realizing that not all wildland fire requires immediate suppression. It is now recognized as a valid course of action to permit wildland fire ignitions to burn (termed Wildland Fire Use or WFU), within established parameters. WFU is an economical and effective means of reducing hazardous fuel loadings.

Role of Aviation in Wildland Fire Suppression

Aviation will continue to fulfill the same mission requirements that it does currently. The aerial firefighting fleet fits the needs of Aviation Mission Requirements enumerated in the document entitled *Interagency Aviation Strategy - Phase 1*. Briefly, these mission requirements listed by priority of function are:

1. Intelligence Gathering - Aerial supervision and recon aircraft, and light helicopters.

2. Command and Control - Lead Planes, Aerial Supervision Modules (ASM) and Air Tactical Group Supervisors (ATGS). This function is vital for both aviation and ground operations. Setting priorities, monitoring progress, making tactical adjustments.

3. Suppressants/Retardants delivery, priority dependent on the time, location, behavior of the fire and mission needs. This includes (Large Air tankers (LATS), Single Engine Air Tankers (SEATS), water scoopers) and helicopters for suppressants/retardants delivery.

4. Personnel Movement, priority dependent on the time, location, behavior of the fire and mission needs. This includes smokejumper and various other aircraft for personnel movement.

5. Aerial Ignition - accomplished by helicopters.

6. Supply delivery - A variety of helicopters and fixed wing aircraft are used for supply delivery.

The relative mix of these roles on any given fire will be determined by several factors including the type, location and duration of incidents. Possible expansions of these roles could include a greater capacity and increased accuracy in the use of aviation in aerial firing operations, greater capability in fire mapping, assessment of fire behavior and potential, and in suppression resource location.

Aircraft

Aviation resources are available nationwide as a mix of different aircraft that include large fixed-wing air tankers (LATs), smaller single engine fixed wing air tankers (Single Engine Air Tankers or SEATs), large and small helicopters, smaller fixed wing aircraft, and smokejumper aircraft. These resources as utilized for various mission roles including suppressant/retardant delivery, aerial supervision, command and control, and movement of personnel.

With the exception of LATs and SEATs, current practice is for each agency to contract for its own aviation resources, often with contracts limited in geographical extent. The USFS manages procurement of LATs and the DOI manages procurement of the SEATs. Aircraft are procured using two forms of aircraft contracts. These are an Exclusive Use type contract in which the government contracts for the aircraft and crew for a specified period of time with the exclusive use of the aircraft reserved for the government. The other form of contract is termed a Call When Needed (CWN for the USFS) or Aircraft Rental Agreement (ARA for DOI) type contract that makes aircraft available to the government at predetermined rates, if the aircraft is available for service.

The table presented on the following page summarizes the 2006 fire season's aerial firefighting fleet by type and procuring entity. The current status and condition of each of the classes of aircraft currently in use in the aerial firefighting fleet is discussed below.

Large Air Tankers

The increasing pace of wildland fire suppression and the very visible role played by LATs on high profile suppression missions generate public interest, media coverage, and congressional attention. LATs are most efficiently used as an initial attack asset. There are some occasions and situations where LATs are effective on extended attack fires. LATs are most effective when engaged in initial attack operations that are well supported by ground personnel and equipment. The current LAT fleet of 19 aircraft has a significant reduction in capacity (approximately 63%) from the 44 LATs available up to and including the 2002 fire season. To some extent, use of additional helicopters and SEATs has mitigated this situation, but total fleet capacity has diminished.

Most safety concerns about LATs stem largely from the age of the aircraft and the long years of service. The LAT fleet has been reduced in numbers due to the termination of contracts during the 2003 fire season that resulted from airframe related safety concerns. A Blue Ribbon Panel report published in December of 2002 addressed the assessment of safety and effectiveness related to federal aerial firefighting. The panel determined that contractor personnel flying large air tankers are subject to a lower safety standard than government personnel flying federally owned and operated lead planes and smokejumper aircraft. Further, the level of safety for both contractor and government aerial firefighting operations is lower than can be financially justified, and is less than expected for any employer concerned about its employees. This disparity in safety standards stems from a government contracting process that assumes the airworthiness of today's large air tanker fleet has been assured by the Federal Aviation Administration type certification process. However, responsibility for the continued airworthiness of aircraft converted to air tankers is up to the contractors who own and operate the aircrafts.

Aircraft Type	**Exclusive Use**		**CWN**	**Total**
	USFS	***DOI***		
Large Air Tankers (Contract)	19			**19**
MAFFS (Military)	8			**8**
Water Scoopers		2	1	**3**
Single Engine Air Tankers	2	20	53	**75**
Large Helicopters/Helitankers (Type 1)	19		59	**78**
Medium Helicopters (Type 2)	28	8	49	**85**
Light Helicopters (Type 3)	54	32	229	**315**
Smokejumper Aircraft	12	7	3	**22**
Aerial Supervision Aircraft	11	11	33	**55**
Large Transport	1		5	**6**
Total All Aircraft Types				**666**

Note: DOI resources listed in this table represent all bureau and organization assets, and does not include state aviation assets.

Single Engine Air Tankers

SEATs represent a growing resource with increasing numbers available and in use. Significant growth in SEAT use has occurred since 2002 and the present number of these aircraft is expected to remain relatively constant for the foreseeable future. In general, turbine SEATs with the highest load capacity are preferred. A diversity of aircraft is currently utilized in the SEAT role including the AT-802, AT-602, Turbine Thrush, and Dromader. The AT-802 aircraft is certificated as an air tanker. The other aircraft do not currently hold certificates for the air tanker role.

Helicopters

Helicopters have been available in sufficient numbers in all type classes used for aerial firefighting. In 2006 availability of CWN/ARA Type 1 and Type 2 helicopters decreased due to a number of factors, including availability of long term contracts with logging and oil/gas industries that reduced the number of available aircraft for firefighting assignments. It is difficult to predict whether this decreased availability in the CWN/ARA fleet will persist, increase or decrease. The helicopter industry continuously improves and updates helicopter designs. Combined with their widespread use for other applications, there has been an adequate supply of sufficiently modern helicopters available for use in the aerial firefighting fleet. Because of the somewhat unpredictable and episodic nature of fire, CWN/ARA demand for the heaviest helicopters (Type 1) faces competition between the needs for fire suppression and the need for private industry usage (logging, oil/gas, etc.). Market demand for this type of helicopter is foreseen to continue and thus will limit the availability of these aircraft under CWN/ARA type agreements.

The utility of helicopters for fire suppression and other wildfire missions is well documented. When water is available nearby, Type 1 helicopters can place more suppressant/retardant onto a wildfire quicker and with greater accuracy than LATS. Type 1 helicopters are exceptionally effective in support of large fire operations and they are more easily used at local, temporary air attack bases than LATs.

Aerial Supervision Aircraft

Aerial supervision aircraft are currently meeting their mission requirements. An equipment replacement program is underway by the USFS and is expected to refresh their fleet over a five-year period. Adequate numbers of appropriate aircraft are expected to be available for the next 15 to 20 years to fulfill Exclusive Use and CWN/ARA needs.

Smokejumper Aircraft

Current smokejumper aircraft are adequate in type and numbers, and are currently well maintained. These aircraft fit the smokejumper mission as designed and they are not known to have current airworthiness issues. As the current fleet ages, efforts are underway to identify, evaluate and contract for newer smokejumper aircraft. Part of the evaluation will be an assessment of the size and speed characteristics needed to fulfill the emerging smokejumper mission.

Aviation Support Infrastructure

The current number and location of Air Tanker Bases (ATBs) is based largely on the requirements of the pre-2003 LAT fleet. Most ATBs were primarily designed to support the LAT fleet, and secondarily to support other types of aircraft. LATs and Modular Airborne Fire Fighting Systems are tied to fixed support bases and the requirements for runways that can support them (i.e., accommodate their takeoff and landing runway length and weight

requirements). While helicopters, SEATs, smokejumper and aerial supervision aircraft do utilize ATBs, these resources do not require the size and capability of an ATB in order to be effective. Acquisition of larger LATs (i.e., 747, DC-10 and others) may not be supportable by some existing ATBs. Additional issues related to ATBs include the capacity to support SEATs and other aircraft types, and the ability to "ramp up" and "ramp down" as workload fluctuates. The current number, location and types of ATBs will be evaluated and adjusted after the long term plan for LATs acquisition is finalized.

Aircraft Type and Fleet Composition

The current federal aircraft fleet is appropriate in terms of numbers and types of aircraft with the exception of suppressant/retardant delivery systems. The total suppressant/retardant delivery capability has decreased by approximately 10% since the end of the 2002 fire season. This includes a decrease in the Exclusive Use fleet of approximately 29% and an increase in the CWN/ARA fleet of approximately 10% (largely due to a significant increase in the number of available 800 gallon SEATs). The increased reliance on helicopters and SEATs has some benefits including greater accuracy and quicker turn around times assuming these resources are located close to the fire site. The reduced availability of LATs decreases the ability to quickly respond to fires located over 75 miles from a SEAT or helicopter location, and also reduces the overall capacity to build/support fire line in heavy fuels and closed canopy fires. Acquiring additional capacity to make up for the 10% short fall vis-à-vis 2002 should be focused on supplementing the LAT fleet through Exclusive Use contracts which generally are less expensive for the government.

IV. Method of Accomplishment

The overarching goal of the strategy is to have the national aerial firefighting community work together more seamlessly. The first major step will be standardization, to the maximum extent possible, across federal and state agencies to promote interoperability of administrative and contracting systems. A smaller but significant step toward this goal will be the development of an integrated, electronic, automatic cost document to replace the currently used OAS-23 and FS-122. A more sweeping step will be adoption of a command and control model that declares all aviation resources (aircraft and flight crews) as "national" resources. Resource allocation will then occur successfully at the geographic and national level while operations will be locally initiated and managed. Establishing standard procedures and capability at the National Interagency Coordination Center and Geographic Area Coordination Committee level to track aircraft location and use for all aviation resources is a critical step necessary for the command and control model to succeed. The requirement for regular, accurate reporting from field units in a common reporting manner has obvious benefits. It may also be possible to make this reporting electronically and nearly automatic.

Coordination, Command and Control

In addition to federally acquired aircraft, many states own and operate aircraft assets. Despite impressive improvement in some geographic areas, there are often multiple USFS regional and AMD processes required to assess and certify state owned aircraft, state operated aircraft and state flight crews. States have difficulty finding a single point of contact that can clarify these issues and effect solutions. Better coordination between federal and state aviation resources will improve the effectiveness of all aviation resources. A standardized process between USFS and AMD regarding the assessment, carding, approvals and payment for state and vendor owned/operated resources is required as a means of furthering this coordination.

Continued emphasis on the use of a national level organization like the National Interagency Aviation Council to facilitate policy and procedure standardization across federal/state lines is critical to achieving maximum state/federal integration. Other means to improve coordination lie in the development of common goals that are identified within this strategic plan, the development and communication of common standards, and standardization of aircraft and pilot/aircrew technical requirements.

Implementation of the comprehensive national strategy offers concrete benefits with improvements in safety and efficiency. These benefits stem from a shift in the current mix of decentralized state and federal authorities to national command and control of aviation resources.

Contracting

There are a number of administrative or contracting support changes that are necessary to achieve maximum effectiveness, flexibility and cost efficiency. The first of these will involve procurement standardization between federal agencies to increase transparency between systems.

This standardization effort might be extended to include the states provided that they elect to participate. Longer duration contracts that include moving aircraft from locations in the "south" to locations in the "north" as the fire season progresses will have both financial and operational advantages. Although the geographical movement of aircraft does currently occur in some instances, expansion and better coordination will result in greater benefits. Current practices do not adequately integrate aircraft procurement with the concept that aircraft are a national asset. Another desirable change will be to have one standard interagency Type 3 helicopter contract and one standard interagency small fixed wing contract to simplify acquisition of these assets, reduce administrative costs and reduce confusion and inefficiency in the field.

Specific strategic improvements include the elimination of helicopter acquisition by type. A shift to specifying aircraft performance requirements into comprehensive national contracts will provide advantages to the government. The expected results of using national contracts are utilization of the proposed helicopter performance dispatch tool at all dispatch organizations. This program will result in greater alignment of environmental requirements, aircraft performance capability and cost efficiency. Standard contract specifications, which would be more outcome based and less prescriptive, will place greater responsibility on aircraft vendors.

Changes in contracting for aircraft will produce a balance between safety and cost effectiveness. Other changes will involve teaming with private industry to pursue alternatives to full reliance upon the CWN/ARA program as the sole contingency fleet. One example of this will be a modified pricing structure where hourly guarantees are awarded, but the aircraft would not be exclusively used by the government during the term of a vendor's contract. Building in the provision of a 24 to 48 hour dispatch notification will also be helpful.

V. Strategic Recommendations

This portion of the comprehensive national aviation strategy identifies specific challenges faced by the interagency wildland firefighting community, and the specific strategic recommendations that must be implemented in order to address them. The recommendations presented in this document have been developed to address the various findings presented in the Blue Ribbon Panel report published in December of 2002 that addressed the assessment of safety and effectiveness related to federal aerial firefighting. These findings are summarized as follows:

FINDING 1–SAFETY

The safety record of fixed-wing aircraft and helicopters used in federal wildland fire management is unacceptable.

FINDING 2–NEW ENVIRONMENT, NEW RISKS

Because the wildland environment has changed significantly, controlling wildland fires cannot be considered an auxiliary mission second to land management. Wildland firefighting has grown to a level of importance that warrants the attention of national leaders.

FINDING 3–AIRCRAFT

Under the current system of aircraft certification, contracting, and operation, key elements of the aerial wildland firefighting fleet are unsustainable.

FINDING 4–MISSION

The variety of missions, philosophies, and unclear standards of federal land management agencies creates a “mission muddle” that seriously compromises the safety and effectiveness of aviation in wildland fire management.

FINDING 5–CULTURE, ORGANIZATIONAL STRUCTURE AND MANAGEMENT

The culture, organizational structure and management of federal wildland fire management agencies are ill suited to conduct safe and effective aviation operations in the current environment.

FINDING 6–CERTIFICATION

The Federal Aviation Administration (FAA) has abrogated any responsibility to ensure the continued airworthiness of "public-use" aircraft, including ex-military aircraft converted to firefighting air tankers. Although these aircraft are awarded FAA type certificates, the associated certification processes do not require testing and inspection to ensure that the aircraft are airworthy to perform their intended missions.

FINDING 7–CONTRACTS

Government contracts for air tanker and helicopter fire management services do not adequately recognize business and operational realities or aircraft limitations. As a result, contract provisions contain disincentives to flight safety.

FINDING 8–TRAINING

Training is under funded and inadequately specified for helicopters, large air tankers, and other fixed-wing operations.

Aviation Resources

Suppressant/Retardant Delivery Platforms

The number of LATs available for mission support in 2002 was 44 that together possessed a total daily drop capacity of approximately 100,000 gallons. At present, there are 19 LATs available for mission support that as a group possess a total daily drop capacity of approximately 40,000 gallons. Some of the capacity deficit between 2002 and present caused by the unavailability of LATs was balanced by implementation of SEATs and helicopter usage. However, the present capacity of the entire fleet of aviation resources to deliver suppressant/retardant is approximately 10% less than the capacity that was available in 2002 due to the unavailability of LATs. As noted previously in this document, the LAT fleet has been reduced in numbers due to the termination of contracts during the 2003 fire season that resulted from airworthiness issues.

There have been great strides taken in developing and implementing management strategies to address airworthiness issues in the federal large air tanker fleet. These include the implementation of service life evaluation programs consistent with the latest FAA requirements for the existing air tanker fleet. There have also been efforts undertaken to enhance tracking of aircraft use as a means of gauging the impact that carrying out the air tanker role has on the structural integrity of the airframe. One element of these strategies has been a major study undertaken as a baseline evaluation of the P2V airframe to the current FAA fatigue and damage tolerance analysis (DTA) requirements of FAR 25.571.

While the wildland firefighting community has made substantial progress in the area of airworthiness improvement, the diminished suppressant/retardant delivery capacity continues to be an issue. One alternative that could be implemented to sustain or increase the number of aircraft in the LAT fleet involves purpose built aircraft.

There has been significant discussion regarding the acquisition of "purpose built" air tankers that are designed from the ground up as mission specific to the air tanker role. These aircraft would be designed to carry and dispense firefighting chemical fluids in turbulent conditions, and to operate at low altitudes and relatively low airspeeds. These aircraft would be certified by the FAA and could be operated over an extended period of time (15 to 20 years). Certification by the FAA would require a manufacturer to "show that catastrophic failure due to fatigue, corrosion, manufacturing defects, or accidental damage will be avoided throughout the operational service life of the airplane," [FAR 25.571]. In addition, the manufacturer must reasonably insure against such failure, and be responsible for "each part of the structure that could contribute to a catastrophic failure, (such as a wing, empennage, control surfaces, and their systems, the fuselage, engine mounting, landing gear, and their related primary attachments)". This is a difficult requirement for a manufacturer to meet and is likely to greatly increase the cost of new product development. Estimates of costs for the development, manufacture, and certification of purpose built large air tankers range from approximately $66,000,000 to over $250,000,000 per aircraft. A major issue in the cost of these aircraft is the relatively small numbers of air tankers that might be built and the billions of dollars in engineering and development cost that would have to be amortized over these planes – before any were actually

built. Therefore, pursuit of the "purpose built" air tanker concept does not appear to be economically or fiscally feasible.

Because purpose built aircraft are not considered to be an achievable alternative to bridge the LAT fleet delivery capacity gap, the recommended short term approach for the LAT fleet is to maintain the current fleet and to obtain former military aircraft (P-3/P-2) augmented with former commercial aircraft (747/DC-10) converted into air tankers. This LAT fleet configuration, supported by SEATs and helicopters, will provide an effective means to accomplish aerial suppressant/retardant delivery.

The recommended long term approach for the LAT fleet is embodied in the "modified" purpose built aircraft concept. This concept involves obtaining transport category aircraft that are not military surplus that can be converted into air tankers.

There are a number of advantages of transitioning from reliance on surplus military aircraft to reliance on modified transport category aircraft as the backbone of the large air tanker fleet. These advantages arise principally from transport category aircraft being "younger" in their design life and the greater availability of information about the use and maintenance of these aircraft. Transport category aircraft have been approved and certificated by FAA. In addition, transport aircraft are more likely to be able to receive continuing support from the original manufacturer. There is also a larger pool of used transport aircraft available in a given make and model to select from when acquiring aircraft. These aircraft also usually have more performance and maintenance data available than do surplus military aircraft. This history is very useful when used to guide decisions regarding a particular aircraft.

The cost of converting transport category aircraft to air tanker use is variable and dependent on the condition and age of the aircraft. Current experience converting surplus military aircraft indicates that costs for converting individual aircraft are in the range of $2,000,000 to $2,500,000 per aircraft. As stated earlier, this cost is heavily dependent on aircraft age and any pending maintenance issues. This conversion includes the cost of procuring and installing tanks and radios. Expenses related to assessing and insuring airworthiness range from $ 300,000 upward and are in addition to this cost. Conversion cost for transport category aircraft is anticipated to be quite similar to those of P-3/P-2 surplus military aircraft.

It is further recommended that during the conversion of the LAT fleet from the current inventory to the "modified" purpose built aircraft inventory, additional SEATs and/or helicopters must be made available for initial and extended attack missions. The number of these additional aircraft needs to be sufficient enough to increase suppressant/retardant delivery capacity by 10% over the current capacity.

Personnel Delivery Platforms

The current inventory of smokejumper aircraft available to the wildland firefighting community is adequate with regard to mix of types (i.e. large aircraft and small aircraft). However, faster aircraft which can travel at +200 knots need to the added to the smokejumper inventory in order

to expedite delivery of personnel during initial attack operations (the speed of current aircraft is approximately 150 knots). The condition of smokejumper aircraft maintained by the USFS and BLM in the Alaska region is characterized as good. However, smokejumper aircraft maintained by the BLM in the Continental United States are reported to be degrading.

In order to address the personnel delivery platform discussed above, it is recommended that sources be identified from which additional and faster smokejumper aircraft can be purchased or contracted. It is also recommended that an upgrade program for smokejumper aircraft be implemented immediately.

Command & Control

The Incident Command System is an effective process for the integration and management of dispatched aviation resources during the prosecution of a fire, regardless of the particular affiliation of the assets (i.e., USFS, DOI, contracted). However, due to cultural differences that have evolved between the USFS and DOI bureaus, decentralized command and control models have been developed by each entity. The decentralized nature of these models result in poor planning for the integrated use of interagency aviation resources, unavailability of critical aviation resources required for responding to a particular fire, inefficient use of aviation resources, and inability to realize maximum cost savings when aviation resources are employed. The decentralized command and control models also result in certain aviation resources being classified as national assets while other are classified as regional or local assets. Furthermore, the command and control approach utilized by land management organizations does not blend well with the approach utilized by emergency response organizations.

A national command and control focus would allow for the flow down of integrated and consistent requirements from a national level through the Geographic Area Coordination Committees and finally to the local level. Improvement of the cooperation and coordination between federal, state, and contracted entities is also an issue.

In order to address the current decentralized command and control models and designation of aviation resource control, it is recommended that an interagency organization be created that is chartered with clearly defined responsibilities and authorities for the command and control of all aviation resources regardless of affiliation or location.

Policies & Procedures

Policies and procedures are the foundation upon which safe and effective wildland firefighting operations are achieved. However, higher levels of safety and efficiency could be achieved through integration and standardization of USFS, DOI, and state policies and procedures related to utilization of aviation resources. Authorization for the use of state-owned aviation resources by federal agencies needs to be consistent regardless of the particular federal agency responding to a fire or the geographic location of the fire. Rules for operating in the fire environment need to be the same for both federal-owned and state-owned aviation resources. Under current procedures, less stringent standards are applied to the operation of state-owned assets over

federal land in cases where the assets remain under state control. However, if control of the same state-owned assets is transferred to a federal agency, more stringent standards are applied. Policies and procedures regarding pilot training, minimum pilot qualifications, and aircraft field inspection requirements also need to be integrated and standardized.

In order to address policy and procedure inconsistencies, it is recommended that state and federal agencies work together to review current standards and requirements, define critical elements, and identify opportunities to begin aligning state and federal standards. The long term goal of this effort will be work toward development of a single national standard for aviation policies and procedures.

Suppressants/Retardants

Suppressants/retardants are an important element of wildland firefighting because the extinguishing capabilities of these products are greater than that of water alone. New suppressants/retardants proposed for firefighting use must undergo testing to evaluate toxicity, corrosion, stability and other factors for potential impacts on the environment, equipment and personnel upon which the product is used, and overall effectiveness in the fire environment. A single USFS entity is responsible for the testing of new suppressants/retardants and for issuing approval for use. At the present time, laboratory testing of new suppressants/retardants must be completed before they are approved for field testing and subsequent long term use. This approach significantly delays the introduction of new products developed by private industry. Also, only products approved by the USFS can be used for wildland firefighting.

In order to address the suppressant/retardant issues discussed above, the following improvements are recommended:

- Perform laboratory and field testing of each new product concurrently followed by approval or disapproval of the product for long term use.
- Provide agencies with autonomy to decide which products to use for a given fire.
- Identify personnel that require training regarding the preparation and use of products to ensure proper and effective use.
- Develop and issue manufacturer technical data packages to field personnel regarding the use of each product.

Emerging Technology

New technology related to avionics, data gathering, and data synthesis continues to be developed by manufacturers and offered to the general aviation community. However, these technological advances tend to be designed for non-fire environment applications and in many cases increase rather than decrease pilot workload in single pilot systems. Furthermore, the process for

approval of new technology for use in the wildfire environment varies between federal and state agencies.

In order to improve the approval and use of new technology in the wildfire environment, the following is recommended:

- Develop a comprehensive interagency process for approval of new technology for use in aviation resources.
- Standardize the use of current and newly approved technology across the aviation firefighting community.
- Develop an approach to more effectively share vendor technical services between the USFS and DOI.
- Ensure that newly authorized aviation technology does not increase pilot workload in single pilot systems.
- Continue to evaluate the usefulness of remote sensing technology and unmanned aerial systems in the wildfire environment.

Acquisition

Contracting of aviation resources from vendors by the USFS and DOI is generally accomplished through Exclusive Use or CWN/ARA contracts. However, each agency implements its own contracting vehicles that vary in type, language, and format depending upon the type of aviation resource being procured. Both Exclusive Use and CWN/ARA contracts have historically presented problems to vendors because the number and types of aviation resources requested by the USFS and DOI are changed each time a new contract is awarded. Therefore, vendors cannot make capital investments in new aircraft with the assurance that they will be required and utilized under future contracts.

Furthermore, CWN/ARA contracts are problematic because the agencies do not guarantee vendors a specific number of aircraft or operating hours to be utilized during a given fire season. Based on this situation, a vendor with a CWN/ARA contract will deploy an asset for other business use (for example logging operations) if it has not been ordered for firefighting, or may deploy an asset for other business use in situations where a higher price can be obtained compared to that approved under the CWN/ARA contract. This scenario has resulted in a reduced number of CWN/ARA aviation resources being available for firefighting when needed.

Agencies have not development acquisition models that address the short-term and long-term needs for the contracting of aircraft and purchase of suppressants/retardants. Agencies also do not reward vendors for value engineering improvements, attainment of contract performance metrics, or improvement of operational safety. Acquisition strategies need to be developed with

the understanding that vendors cannot support aviation firefighting for significantly less cost than that incurred by the Government for the same effort.

In order to improve acquisition efficiency and effectiveness, the following is recommended:

- Develop a single interagency contracting approach for acquisition of aviation resources and suppressants/retardants that employs the use of national contracts.

- Develop a national acquisition model that defines short term and long term aviation resources needs for all aircraft types.

- Award +10 year contracts for acquisition of vendor-owned aviation resources.

- Develop hybrid contracts that incorporate the elements of both Exclusive Use and CWN/ARA contract vehicles.

- Include incentives within vendor contracts for value engineering improvements, attainment of contract performance metrics, improvement of operational safety, and acceptable past performance.

VI. Strategy Development Participants

The organizations and individuals listed below participated in a workshop held in Boise, Idaho on August 8th and 9th, 2006 regarding the comprehensive national strategy for use of aviation resources in wildland fire management. Their contributions form the basis of the information, issues, and strategic recommendations that comprise the comprehensive national strategy.

Federal Participants

Dave Dash - Bureau of Land Management
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Joel Kerley - Bureau of Indian Affairs
Lyle Carlile - Bureau of Indian Affairs
Harlan Johnson - National Business Center
Harry Kieling - National Business Center
Al Rice - National Business Center
Pat Norbury - U.S. Forest Service
Chuck Taylor - U.S. Forest Service
Scott Curtis - U.S. Forest Service
Sue Prentiss - U.S. Forest Service
Scott Fisher - U.S. Forest Service
Kathy Allred - U.S. Forest Service
Neal Hitchcock - U.S. Forest Service

Vendor Participants

Janet Parker - Minden Air Corporation
Rich Denker - Minden Air Corporation
Leonard Parker - Minden Air Corporation
Harold Summers - Helicopter Assoc. Intl.
Todd Petersen - Columbia Helicopters
Christian Holm - Neptune Aviation Services
Kristen Schloemer - Neptune Aviation Services
Ron Hunter - Aero Union Corporation
Terry Unsworth - Aero Union Corporation
Travis Garnick - Butler Aircraft Company
Nan Garnick - Butler Aircraft Company
Ron Raley - Phos-Chek
George Roby - Phos-Chek
Beryl Shears - Western Pilot Service
John Wakefield - Aerial Timber Applicators
Dennis Lamun - Airtanker Consultant
Dave Johnson - Mid-Valley Helicopters
Jill Johnson - RAM Systems

State Participants

Jim Ziobro - Oregon Department of Forestry
William Pate - North Carolina Division of Forest Resources
Ron Hollifield - North Carolina Division of Forest Resources
Donald Artley - National Association of State Foresters