

DECISION MEMORANDUM FOR THE DIRECTOR, FIRE AND AVIATION  
MANAGEMENT

FROM: Arthur W. Hinaman  
Assistant Director, Aviation

SUBJECT: Implementation of Ram-Air Parachute Delivery System in Support of  
Continuous Improvement and Innovation in the U.S. Forest Service  
Smokejumper Program

FILE CODE: 5100/5700

BACKGROUND:

In order to improve the safety and effectiveness of our smokejumpers, the U.S. Forest Service is proposing a transition to the ram-air parachute delivery system. This transition is part of an overarching continuous improvement and innovation effort to expand the mission capability of the smokejumper program and take advantage of emerging technology. The Director, Fire and Aviation Management, has the authority to make this decision, per FSM 5704.

The environment in which U.S. Forest Service wildland firefighters operate continues to increase in complexity due to hazardous fuel build-ups; insect and disease infestations; non-native species invasions; climate change; drought; the presence of approximately 70,000 communities in the wildland-urban interface; and other factors. U.S. Forest Service and other scientists have confirmed that the number, size, intensity, and duration of wildfires has increased and that fire seasons have become longer. Many U.S. Forest Service and other scientists predict these trends to continue, with some forecasting the number of acres burned to double or triple by mid-century; fire seasons continuing to lengthen; and another 17 million housing units to be built within 30 miles of national forests, national parks, and wilderness areas by 2030.

The increasing complexity in the wildland fire environment has resulted in some sobering statistics. In 2006, 9.87 million acres of federal, state, and private land burned nationwide, the highest number of acres since 1960, as far back as reliable records go. Since 2000, more than 5,000 structures have been lost in one year three times. In 2013, a total of 34 wildland firefighters perished in the line of duty, the highest loss of life of wildland firefighters in one year since 1994.

The U.S. Forest Service must seek continuous improvement and innovation in our equipment, aircraft, training, and other areas to ensure that we maintain sufficient operational capability to meet the challenges associated with increasing complexity in the wildland fire environment. While continuous improvement and innovation can increase risk, so can stagnation in terms of potential escalating loss of lives, property, and valuable natural and cultural resources.

The U.S. Forest Service smokejumper program is an elite program, born of innovation. Of the 10,000 firefighters in the U.S. Forest Service approximately 320 are smokejumpers. The U.S.

Forest Service smokejumper program was born in 1934 when visionary Intermountain Regional Forester T.V. Pearson first proposed it as a means to quickly provide initial attack on forest fires. U.S. Forest Service smokejumpers have been leaders in innovation since the first fire jump was made in 1940 on the Nez Perce National Forest. For the last 75 years, U.S. Forest Service smokejumpers have played a vital role in wildfire suppression by providing a unique capability to deliver large numbers of highly skilled, qualified firefighters over large distances in a short amount of time. U.S. Forest Service smokejumpers are envisioned to continue to be a critical component of the U.S. Forest Service Fire and Aviation Management program in the future. It is critical to ensure that they have the appropriate equipment, aircraft, and organizational configuration to ensure that they can support the mission of getting the right assets to the right places at the right time. Based on extensive study and discussions with the smokejumper community, I believe that it is necessary to seek continuous improvement and innovation in each of these program elements, beginning with a measured transition to the ram-air parachute delivery system.

## DISCUSSION

Round parachutes, which U.S. Forest Service smokejumpers have been using since the program's inception in 1939, have reached the limits of their performance while ram-air parachute technology is still evolving. Ram-air parachutes are more maneuverable and enable smokejumpers to jump in higher winds than round parachutes. This supports an earlier response to critical wildfires, reducing the chances that they will become large, costly, and dangerous to other firefighters and the public. Investment in the ram-air parachute delivery system at this time is expected to yield further improvements in safety and efficiency in the future.

Since 2008, the U.S. Forest Service has gained extensive experience in ram-air parachute technology through a pilot program in the Northern Region (R1) and has developed the expertise to transition the agency's smokejumper program to ram-air parachute technology. Over the last seven years, approximately 55 U.S. Forest Service smokejumpers made approximately 5,000 training and operational jumps using ram-air parachutes.

Firefighter and public safety are the U.S. Forest Service's top priorities in wildland fire management. The U.S. Forest Service has gathered and thoroughly examined extensive data on injuries and fatalities experienced by smokejumpers on both round and ram-air parachute delivery systems and has concluded that a transition to the ram-air parachute delivery system will improve overall safety in the long term. Due to ram-air parachute technology allowing for slower vertical landing speeds, it is expected that the Forest Service will see a reduction in injuries to the ankles, legs and hips during parachute landings. Analysis of information from 2001 through 2014 in MTDC's parachute landing data base shows the overall likelihood of injury on any given jump is 0.33% using round parachutes and 0.21% using ram-air parachutes. The overall minor injury rate is 0.22% using round parachutes and 0.15% using ram-air parachutes. The overall serious injury rate is 0.10% for round parachutes compared to 0.06% for ram-air parachutes.

The ram-air parachutes that U.S. Forest Service smokejumpers are currently using, and will continue to use, are equipped with a reserve static line (RSL), which automatically opens the reserve container when the main parachute is cut away due to a malfunction, as well as an

automatic activation device (AAD) that will automatically open the reserve container if the jumper is unable to open the primary ram-air chute.

At this time, initial investment in a ram-air parachute delivery system is estimated at approximately twice the cost of the current FS-14 system. However, procurement efficiencies on the scale of the entire program have not yet been explored. Procurement strategies will be monitored and adjusted to capitalize on costs-savings opportunities, but not at the expense of quality or safety. The handful of times that ram-air jumpers have been able to jump when others couldn't, and may have been able to suppress wildfires while they were still small, may have translated to savings equal to the cost of the entire U.S. Forest Service smokejumper program.

ALTERNATIVES:

1. Seek continuous improvement and innovation in smokejumper equipment, aircraft, and organizational configuration, beginning with a measured transition to ram-air parachute technology in 2016.
2. Keep Forest Service on the round parachute delivery system and revisit parachute technology in ten years.
3. Continue the ram-air program only in Region 1 and continue to capture data on the effectiveness and efficiency of ram-air parachute technology.

DECISION:

The U.S. Forest Service will begin a measured transition to a ram-air parachute delivery system at smokejumper bases, to replace round FS-14 parachutes currently in use. A change management and implementation plan will be developed to start transition at the beginning of Fiscal Year 2016. There will be continual assessment and management the associated risks of this transition.

Key to the success of this transition is to continue to support smokejumpers and their equipment throughout the transition. This includes supporting both the round parachute system and the ram-air parachute system for the duration, and ensuring that smokejumpers who do not successfully transition to ram-air are given appropriate employment assistance within the agency.

DECISION BY THE DIRECTOR, FIRE AND AVIATION MANAGEMENT:

Approve X

Date 01 JULY 2015 

Disapprove \_\_\_\_\_