



S e s s i o n V I I

Success Stories in Reducing Fire Management Costs
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Wildfire Cost Reductions Through Equipment Development and Standardization¹

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Abstract

Standardizing equipment and clothing can reduce the costs of fighting wildfires by allowing items to be purchased in large quantities. In the U.S. Department of Agriculture, Forest Service, equipment is developed at two Technology and Development Centers, one in Missoula, Montana, the other in San Dimas, California. After a prototype has been developed, new items of equipment are tested in the field and completed with design specifications and drawings. The General Services Administration procures large quantities of items meeting these specifications, saving an average of 25 percent of the total cost. During the past 5 years, agencies have purchased about \$26 million in clothing and equipment each year, with savings of about \$6.5 million a year by purchasing through the General Services Administration.

When Ranger Edward Pulaski gathered his forces to battle the 1910 wildfires in northern Idaho, firefighters showed up with the clothes on their backs. Their tools were the basic hand tools they used on other forestry projects or those they used on other farm or woods projects.

Fire suppression in the 1990's operates in a different world. On September 9th, 1998, the *Missoulian* reported on fire fighting in northwestern Montana that summer. The fire camps were home to 4,847 firefighters and \$4.8 million worth of equipment, weighing 504,000 pounds. The equipment included: 189 pumps, 172 chainsaws, 1,700 sleeping bags, 7,600 sleeping pads, 4,100 Pulaskis, 2,500 shovels, 6,300 yellow shirts, 4,850 pairs of green jeans, 136,400 batteries, 63 miles of garden hose, and 128 miles of fireline hose.

Today, wildfires are a problem in Canada, Mexico, Mongolia, Spain, Australia, Siberia, and Greece, as well as the United States. Worldwide, wildfires are fought using essentially the same strategy and tactics, with equipment that is nearly identical. Regardless of a country's economic status, funding wildfire suppression operations is a major financial commitment.

Wildland fire equipment is part of the global economy. In response to major wildfire problems in the 1990's, fire equipment was shipped from the United States to Mongolia, Mexico, Indonesia, and to countries in South America. Multinational producers now make some items of wildfire clothing and equipment. The General Agreement on Trade and Tariffs, the European Union, and the proposed International Standards Organization standards on wildfire equipment will speed up international trade in wildfire equipment.

History of Fire Equipment Development

At the turn of the century, wildfire equipment development was an informal, backyard type of affair. Farmers, ranchers, and loggers developed equipment for their specific needs, often sharing their best ideas with neighbors. The Transfer Act of 1905 brought some focus in equipment development for the USDA Forest Service. Ranger Malcolm McLeod headed that effort. After Ranger Pulaski's heroic actions saved the lives of 35 firefighters during the 1910 fires, equipment development gained recognition. The fire fighting tool that gained popularity early in the 20th century was refined by Ranger Pulaski and took on his name. In 1912, a fire shield was developed that allowed fire fighters to get closer to a fire.

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In 1920, the Forest Service awarded the first commercial contract for production of Pulaskis. At the Mather Field Conference in 1921, Chief Forester William B. Greeley reported on the importance of inspections, physical inventories, and distribution of fire fighting equipment. An equipment standardization conference at Spokane, Washington, in 1936 brought additional focus to the issue of wildfire equipment development. By the 1960's, the Forest Service had established Equipment Development Centers in Montana and California. The Michigan Department of Natural Resources established a Forest Fire Equipment Center in Roscommon, Michigan.

Availability of Wildfire Equipment

Structural firefighters get their equipment almost exclusively from commercial manufacturers and suppliers. However, agencies that fight wildfires have many supply sources:

- All wildfire agencies regardless of size or affiliation can obtain equipment from commercial suppliers.
- Federal agencies and their cooperators (States and others) can purchase fire equipment through the General Services Administration (GSA).
- Several larger State agencies, such as the California Department of Forestry, manufacture their own wildfire clothing through organizations such as prison industries.

When larger fires require extraordinarily large amounts of equipment, nine national fire caches (eight managed by the Forest Service and one by the Bureau of Land Management) and two GSA warehouses are available. In addition, a fleet of fire cache trailers, each with enough equipment to support 250 firefighters, are located across the country. With the recent evolution of contract crews who are unable to buy supplies through Federal sources, several commercial suppliers have begun increasing their stocking levels during fire seasons.

Equipping wildland firefighters in Federal agencies is based on standardizing equipment so it can be used by all agencies. The firefighters who respond to multi-State wildfires take only two sets of protective clothing with them, exchanging dirty sets at the supply unit as needed. This closely approximates the direct exchange (DX) concept widely used by the military services of the United States.

Standardization and Quality Assurance

When the Forest Service's two Equipment Development Centers were fully chartered in 1960, Federal wildfire agencies started seeing the first benefits of equipment standardization on a large scale.

More and more wildfire equipment was developed at the Equipment Development Centers, tested in the field, and completed with design specifications and drawings. Afterward, equipment of consistent quality could be procured at the best price for the government.

Currently, the two Forest Service Centers (renamed Technology and Development Centers) are responsible for more than 200 design specifications. The GSA procures items meeting these specifications for Federal wildfire agencies, their State partners, and other cooperators. The equipment is distributed nationally and to other countries during emergencies.

How big has the program grown? In the 5-year period from 1994 to 1998, the total GSA fire equipment sales based on specifications and drawings produced by the two Forest Service Centers averaged nearly \$26 million per year. During 1994, when large fires burned throughout the western United States, sales topped \$34 million.

Standardization of wildfire equipment for Federal and State agencies achieved a new level of acceptance in 1993 when the first National Fire Protection

Association (NFPA) standard on wildfire protective clothing equipment was adopted in the United States. The standard, NFPA 1977, includes helmets, shirts, trousers, gloves, boots, and fire shelters. It sets minimum performance standards for wildland firefighters' personal protective equipment that enable commercial manufacturers and suppliers to offer products outside the GSA program. This standard, updated in 1998, helps ensure that all wildland fire agencies provide firefighters the minimum levels of protection from the dangers of wildfire.

Besides the NFPA standard in the United States, the Canadian General Standards Board has recently completed work on the first Canadian standard for wildland firefighters' personal protective equipment. In addition, the International Standards Organization is working on a draft proposed standard for wildland firefighters' personal protective equipment. That standard will have international standing under the General Agreement on Trade and Tariffs.

All the standards are important. They offer a needed level of protection to wildland firefighters while providing a "level playing field" for manufacturers and suppliers.

Cost Savings on Wildfire Equipment: The Federal Experience

Wildfire equipment procurement for Federal agencies and cooperating State agencies is a success story for the American taxpayer and for fire fighting agencies.

Design specifications prepared by the two Forest Service Centers are forwarded to the GSA wildfire program at Fort Worth, Texas. There, procurement contract specialists solicit bids, review a bidder's ability to deliver a product, and award contracts for a wide variety of clothing, tools, and equipment needed by the wildland firefighter. Because of the vast economies of scale provided by the GSA bidding process, manufacturers are able to offer their "most favored customer" rates on each solicitation, resulting in huge cost savings for the taxpayer. The GSA, as a semiautonomous government agency, charges an overhead fee on each item to offset its costs. Aside from the solicitation and contract actions, GSA provides quality assurance specialists at individual plants to ensure that design specifications are rigidly followed. They also maintain large fire equipment warehouses at Stockton, California, and at Fort Worth, Texas, for the short-term emergency equipment needs of fire agencies across the country, as well as for international support missions, such as those to Mexico and Mongolia in 1998.

Each year, the GSA publishes a catalog of wildfire protective equipment and supplies that is widely distributed throughout the wildland fire fighting community. Because each item has been standardized, fire fighting units have confidence that they will receive exactly what they request and that it will be fully interchangeable or adaptable with equipment already in the field.

Does all this standardization of equipment, coupled with volume purchasing, really result in cost savings? In 1997, a study compared prices in the GSA fire equipment catalog to those in catalogs for major forestry and fire suppliers (Ben Meadows, Forestry Suppliers, Mallory, and Darley).³ Prices charged by the four commercial suppliers were averaged and compared to the GSA prices to show the potential savings.

- Only one fire shelter is manufactured commercially in the world. It is built according to Forest Service specifications and sells in the GSA fire catalog for \$39.34. The commercial suppliers' average price is \$89.98, a difference of \$50.64. In Fiscal Year 1998, the GSA sold 28,370 fire shelters, saving fire fighting agencies \$1,436,567.
- In 1998 the GSA sold 27,888 fire shirts for \$43.43 each. These 5.5-ounce Nomex shirts were compared with 4.5-ounce Nomex shirts from

³Mention of trade names or products is for information only and does not imply endorsement by the U.S. Department of Agriculture.

commercial suppliers that cost an average of \$74.12. Savings in 1998 totaled \$855,883.

Across the board, fire fighting agencies save about 25 percent by procuring clothing and equipment through the GSA. Applying the 25 percent savings to the average annual GSA sales of \$26 million in fire fighting equipment results in an average savings of \$6.5 million each year.

Downside of Standardization

Although this paper strongly supports standardizing fire clothing and equipment, several aspects of standardization may be considered drawbacks.

Cost efficiencies realized through standardization are greatest when the products are the most widely used. This is especially true of clothing, where items are generally produced to meet the size needs of 80 to 90 percent of the general population. About 10 to 20 percent of firefighters fall outside that range. The needs of those who are very tall, short, heavy, or thin often are not met by standardized production runs. Fortunately, a solution exists. The wildfire supply community now has suppliers that cater to large or tall sizes.

A different situation exists for standardized equipment-hand tools and backpacks---used by wildland firefighters. Although standardized equipment may fully meet the firefighters' physical needs, it does not allow them to show their individuality. The proliferation of specialized hand tools---the Super P, the Reinhartski, and similar tools---and the myriad of firefighter field packs demonstrate that every individual seeks recognition. The cost efficiencies of fire equipment standardization are not important to those seeking to establish their identity in the wildland fire fighting world. I hope those firefighters will remain just a small percentage of the total work force.

Future of Fire Equipment Supply

What changes will the 21st century bring to the wildland fire equipment supply system? Will the year 2000 computer bug destroy all the gains in cost efficiency that have occurred in the past millennium?

Some predictions can be made about the future of wildland fire fighting worldwide:

- The problem of wildfires is increasing in scope and complexity.
- Today's essentially unlimited dollars at the Federal level will not continue to be available.
- Globalization of the fire suppression effort will increase, requiring standardization and the ability to interchange equipment.
- The General Agreement on Trade and Tariffs and future International Standards Organization standards will affect equipment procurement for wildfire agencies worldwide.
- Interagency cooperation at the national and international level will require standardizing equipment to assure maximum efficiency and safety for wildland firefighters.