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Report to the Chairman, Subcommittee on National Parks, Historic Preservation, and Recreation, Committee on Energy and Natural Resources, U.S. Senate

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PARK SERVICE

Agency Is Not Meeting Its Structural Fire Safety Responsibilities



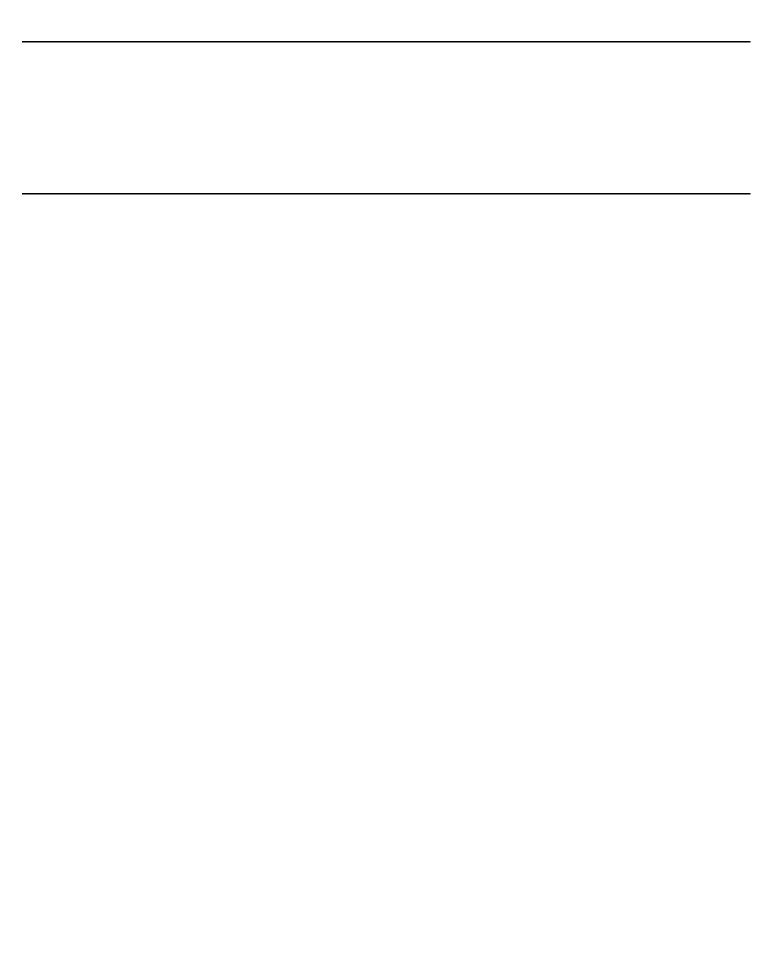


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Abbreviations

NHS	National Historic Site
NFPA	National Fire Protection Association
NP	National Park
NPS	National Park Service
OSHA	Occupational Safety and Health Act





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Resources, Community, and Economic Development Division

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May 22, 2000

The Honorable Craig Thomas Chairman, Subcommittee on National Parks, Historic Preservation, and Recreation Committee on Energy and Natural Resources United States Senate

Dear Mr. Chairman:

The National Park Service's role as caretaker of many of the nation's natural, cultural, and historic treasures has grown substantially since the agency was created in the Department of the Interior over 80 years ago. Today, the Park Service is the nation's steward for over 30,000 structures, many of them historic; many national icons, such as the Statute of Liberty; and over 80 million artifacts. These structures include hotels; motels; cabins; visitor centers; interpretative centers; and historical buildings, such as Independence Hall and many former presidents' homes. In terms of buildings alone, the Park Service is the federal government's third largest landlord. Each year, over 270 million people visit these facilities.

The Park Service is responsible for ensuring that the buildings and artifacts entrusted to it are protected and that the people who visit or work in them are safe from undue hazards or risks. However, one risk—the threat of fire—has been a recurring issue. While much public and media attention has historically focused on spectacular wildland fires, like those that occurred in Yellowstone National Park in 1988, building or structural fires within parks have not received much attention. Nonetheless, since 1990, more than 1,400 fires have occurred in national park buildings and other facilities. These fires have killed five people, caused serious injury to many others, and resulted in millions of dollars in property loss. Even the newest buildings can be susceptible. For example, as recently as March 2000, a 1-year-old hotel at Sequoia-Kings Canyon National Park in California was damaged by fire. (See fig. 1.)

¹ Structural fires include fires in buildings, dumpsters, and vehicles.



Figure 1: Fire Damage at New Hotel in Sequoia-Kings Canyon National Park

This report analyzes the Park Service's efforts to prevent and respond to fires in the many structures (structural fires) in the national park system. It does not address the agency's efforts to respond to wildland fires. Concerned about the effectiveness of the Park Service's efforts to protect human life and property, you asked us to review parks' structural fire safety efforts. As agreed with your office, our work focused on answering the following questions:

- Are parks effectively addressing their structural fire safety responsibilities?
- If not, what are the main reasons?
- What improvements, if any, are under way to address identified problems?

To answer these questions, we focused our work on six parks that provided a cross-section of the types of natural and historic parks administered by the agency. While these parks may not be statistically representative of the national park system as a whole, agency officials told us the structural fire safety activities at these locations were not likely to differ substantially among the parks throughout the system. A more detailed description of our scope and methodology is in appendix I.

Results in Brief

Structural fire safety efforts at national parks are not effective. The structural fire activities at the six parks we visited lacked many of the basic elements needed for an effective fire safety effort. These gaps included such fundamental things as inadequate fire training for employees, inadequate or nonexistent fire inspections, and—for many buildings—inadequate or nonexistent fire detection or suppression systems. These situations led to many fire safety hazards. We found fire extinguishers that had not been checked for years, overnight accommodations that had not been inspected by qualified fire safety people, cabins without smoke detectors, and visitor centers that did not have fire-suppression systems. Furthermore, Park Service documents show that even when fire hazards are detected, they can go uncorrected for years. As a result of these conditions, the safety of park visitors, employees, buildings, and artifacts are being jeopardized and are vulnerable to fire that could cause damage, destruction, severe injury, and even the loss of life.

These deficiencies occur principally because local park managers are not required to meet minimum structural fire safety standards and because structural fire activities have been a low priority within the agency. The Director of the Park Service issues general policy to local park managers about how to address structural fire safety. However, park managers are not required to follow the agency policy, nor are they required to meet a minimum set of fire safety standards. Instead, individual park managers are permitted to define the scope and emphasis given to the threat of structural fire at their respective parks. Our work, as well as a recent analysis by Park Service staff, show that structural fire safety is near the bottom of the parks' priority lists.

²The six were Ford's Theatre National Historic Site in Washington, D.C.; Olympic National Park in Washington State; Prince William Forest Park and Shenandoah National Park in Virginia; and Sequoia-Kings Canyon National Park and Yosemite National Park in California.

The Park Service acknowledges problems in implementing its structural fire safety activities and has begun a number of initiatives to address them. These initiatives include (1) developing new agency policies for addressing structural fire safety responsibilities, (2) placing specific minimum fire safety requirements on park managers, and (3) developing a process for structural fire building inspections and performing assessments of structural fire risks at each unit of the national park system. However, these initiatives have only recently begun and are now in the early planning stages. In addition, the agency does not have plans to provide the resources needed to complete and implement the initiatives. Until these initiatives are completed and appropriate corrective actions are taken—which, at best, are years away—the Park Service may not meet its responsibilities for structural fire safety.

We are making recommendations to the Secretary of the Interior to ensure that the Park Service addresses its structural fire safety needs and holds park managers accountable for developing and implementing effective fire safety programs. In commenting on our draft report, the Department of the Interior said that the report accurately reflects the general status of structural fire safety issues in the Park Service. In addition, after we received the Department's comments, the Acting Associate Director, Park Operations and Education, told us that the Park Service agrees with the report's conclusions and recommendations and is considering plans to implement the recommendations.

Background

Until recently, the Park Service provided its regional offices and local park managers with a safety and health policy that stated, among other things, structural fires will be suppressed to prevent the loss of human life and to prevent damage to real property or cultural or natural resources.³ The policy cited several legislative authorities, such as the Occupational Safety and Health Act (OSHA), and many other reference sources that the park managers may consider in addressing structural fire safety needs. However, this policy was quite general and did not specify the fire safety codes, regulations, or other requirements that park managers should follow in organizing and implementing structural fire safety activities at the park level. Essentially, the policy suggested that individual park managers

³ The agency's policy on structural fire safety is set forth in two guidelines: Structural Fire Guideline, Release No. 1, NPS-58 (June 1987) and Loss Control Management Guideline (safety and health guidance), Release No. 2, NPS-50 (September 5, 1991).

determine the structural fire needs at their respective parks and develop and implement structural fire procedures and activities to meet the parks' needs.

In December 1999, the Park Service replaced its general safety and health policy with more specific policy about what park managers should do to address their structural fire safety responsibilities. This new policy lists requirements such as (1) the installation, inspection, and maintenance of fire alarms and suppression systems and (2) fire prevention and emergency response training for park personnel. However, this new policy did not specify what the objectives of the agency's structural fire efforts would be or how park managers should develop and implement an effective structural fire safety program.

Parks Are Not Effectively Meeting Their Structural Fire Safety Responsibilities

None of the six parks we visited had effectively addressed their structural fire safety responsibilities. In fact, most of the basic components necessary for addressing parks' structural fire risks were missing at each park. These gaps have resulted in significant and, in some parks, long-standing deficiencies that have seriously compromised fire safety.

Key Elements Generally Missing From Parks' Structural Fire Safety Activities

According to structural fire safety experts from the National Fire Protection Association, U.S. Fire Administration, and fire experts from six other fire associations and government agencies we contacted, an effective structural fire safety effort has three essential components: fire prevention and protection, fire response, and funding. Both the fire prevention and protection component and the fire response component have a number of key elements associated with them. However, at each of the six parks most of the key elements were missing.

Fire Prevention and Protection

According to the structural fire safety experts we contacted, there are three key elements to effective fire prevention and protection:

⁴ NPS Director's Order and Reference Manual #50B, Occupational Safety and Health Program.

- A fire plan that documents the plan's purpose and objectives and provides current procedures and site layouts for handling fire risks and incidents.
- Routine fire safety inspections that are done by qualified personnel so that fire risks can be identified in time and corrected, and
- An incident-reporting system to document and analyze fire incidents and trends so that needed program changes or corrective actions can be identified.

None of the six parks we sampled had adequate fire plans. At each park we reviewed, the plans were either out of date or not coordinated with nearby community fire departments, or had some combination of these problems. For example, the fire plan at Shenandoah National Park was prepared in 1991. Since that time, the plan has not been updated to reflect the addition of new buildings or other changes in park operations. Updating the plan is particularly important at this park because, according to park managers, the park has an inadequate fire brigade and therefore must rely heavily on fire departments from local jurisdictions outside the park to respond to fires. Another case in point is Prince William Forest Park. Because this park does not have a fire brigade, it relies entirely on fire departments from surrounding county jurisdictions to respond to structural fires within the park. However, the officials we contacted at the local fire departments were not involved in the development of the park's fire plan and have not even seen the plan.

Similarly, regarding inspections, none of the parks we visited had their facilities regularly inspected for fire safety by qualified individuals. Examples of structural fire inspection deficiencies that we identified included the following:

- At Yosemite National Park, until 1999, none of the park's 800 structures had a formal structural fire safety inspection, including the 123-room Ahwahnee Hotel—a national historic landmark. In fiscal year 1999, the park hired, for the first time, a trained structural fire inspector to begin fire inspections for its 800 structures.
- Sequoia-Kings Canyon National Park had no structural fire safety inspections, even though the park has about 250 buildings and other facilities, and has had 41 structural fires since 1988.
- As shown in figure 2, at Olympic National Park, a Park Service-owned building continues to be used as office space by employees of a nonprofit organization, even though the park stopped using the structure for its own employees about 10 years ago because of unsafe

conditions, including fire risks. The building's roof, siding, and foundation were in serious disrepair, and the interior ceiling was sagging severely. Inside the structure, electrical cords were hanging over and through furnishings, and rainwater dripped through the roof onto interior furnishings. The building did not have any fire detection or sprinkler systems, even though flammable paper storage boxes were strewed throughout the structure. According to several park officials, the condition of the building's exterior and interior posed serious fire risks to its inhabitants. The acting fire chief of a nearby city's fire department told us that the building would have been condemned for human habitation if the structure were within the city's jurisdiction.

Figure 2: Deteriorated Park Service Structure Used by Nonprofit Association at Olympic National Park



• In February 2000, during a visit to Ford's Theatre in Washington, D.C., we noted that serious deficiencies concerning stairwell and stage doors had not been corrected even though they were first identified by a National Park Service (NPS) contractor in 1993 as part of an ad hoc fire safety evaluation. (See fig. 3.) The evaluation report stated, "If the sprinkler system fails or does not operate as designed, a fire in the stage area, particularly during a production, has the potential to kill several

hundred people. . . . Fires in other theaters show that a severe fire can develop in a few minutes."



Figure 3: Wires Running Under Stage Fire Door of Ford's Theatre

The remaining key element in fire prevention and protection, according to the structural fire safety experts we contacted, is the submission of data on structural fire incidents to a national database to analyze fire trends and causes so that corrective measures can be devised and initiated. Three of the six parks we visited did not participate in an agencywide fire incident reporting system. Failure to report this kind of information undermines the agency's ability to understand the scope of fire problems and vulnerabilities

throughout the national park system. This, in turn, diminishes the Park Service's ability to set priorities for its safety needs.

Table 1 summarizes the gaps in the fire prevention and protection activities at each of the parks we visited.

Table 1: Extent to Which the Six Parks Implemented Key Elements of Structural Fire Prevention and Protection

Key elements of effective structural fire prevention and protection	Ford's Theatre National Historic Site	Prince William Forest Park	Olympic National Park	Sequoia- Kings Canyon National Park	Shenandoah National Park	Yosemite National Park
Is the fire plan adequate?	No	No	No	No	No	No
Are regular structural fire inspections conducted using qualified personnel?	No	No	No	No	No	No
Does the park participate in national-fire-incident reporting system?	а	Yes	No	No	Yes	No

^a Not applicable. Has not had any fires.

Fire Response

According to the structural fire safety experts we contacted, two key elements are needed to effectively respond to fires, namely, (1) fire detection and suppression systems and (2) fire brigades and/or agreements with community fire departments. None of the parks in our sample had an adequate fire response capability.

Fire detection systems generally refer to devices or systems ranging from individual battery-operated smoke detectors to hard-wired fire alarm systems that are centrally monitored. Suppression systems commonly refer to automatic sprinkler systems that are electronically operated. Suppression systems, such as sprinklers, should be a key component in any structural fire safety effort, according to fire experts, and are especially important to the Park Service because of the remoteness of many facilities and the delayed fire response capabilities generally found in many parks. In addition, where fire detection and/or suppression systems are installed in buildings, experts agree that it is critical that these systems be maintained and tested periodically to ensure they are working properly.

Each of the six parks were either missing detection or suppression systems in key facilities, such as visitor centers and overnight lodging facilities, or were not being maintained and tested properly, if at all. Examples follow:

- At Prince William Forest Park, smoke detectors were not installed in many cabins used as overnight accommodations by visiting guests. Frequently, these guests are youth organizations.
- At Yosemite National Park, sprinkler systems were installed in about 20 percent of the buildings. In commenting on our draft report, the Department of the Interior reported that without an analysis of the buildings and risk assessment, it is impossible to say whether or not the appropriate number and types of buildings have sprinkler systems. None of the systems, however, have been tested since they were installed to make sure that they are operating properly. In addition, park officials did not take corrective action on defective sprinklers involved in a wellpublicized nationwide recall. A park manager told us that the park did not meet a 1999 deadline set by the U.S. Consumer Product Safety Commission and the manufacturer to qualify for the reimbursement of labor costs associated with replacing, parkwide, about 1,000 recalled sprinkler heads. These sprinkler heads are used in fire suppression systems in residences where park employees live. According to the Consumer Product Safety Commission, the defective sprinkler heads. identical to those installed at Yosemite, failed to function in at least 20 fires. Nonetheless, the park has not replaced these sprinkler heads and is still relying on them as a key part of its fire safety effort.

To complement fire detection and suppression systems, adequate fire response requires fire response crews who are properly trained and equipped. Within the Park Service, adequate fire response is frequently accomplished by the use of fire brigades. Fire brigades are similar to community fire departments and include firefighters, fire equipment, and flame-retardant clothing located in or near the park. The Park Service has come to rely on the use of fire brigades in parks that are some distance from community fire departments. In parks that are not remote, the park managers frequently have agreements with nearby community or other fire districts for initial response or additional backup for responding to fires.

Each of the six parks we visited either did not have a qualified or properly equipped fire brigade or their response capability was not fully coordinated with local fire departments. Examples follow:

• At Yosemite, in 1999, 42 of 45 of the firefighters stationed in Yosemite Valley—the central and busiest area of the park—had not taken the agency's annual 16 hours of required minimum training or had no record of any training.

- Shenandoah National Park does not have qualified personnel to respond to structural fires. The park has a collateral-duty fire brigade that has not been trained to enter a burning structure and lacks the necessary equipment to respond to vehicle fires. The park's policy is to rely on local fire departments for entering burning structures. However, the departments' response times range from 10 to over 45 minutes. According to fire experts contacted, a much shorter response time—4 to 6 minutes—is generally needed to respond to burning buildings.
- Olympic National Park has fire response agreements with only two of nine fire departments in the surrounding area. As a result, many areas of the park have no formal arrangements with local fire departments for a structural fire response.

Table 2 summarizes the gaps in the fire response activities at each of the six parks visited.

Table 2: Extent to Which the Six Parks Implemented Key Elements of a Structural Fire Response Capability

Key elements of an effective structural fire response capability	Ford's Theatre National Historic Site	Prince William Forest Park	Olympic National Park	Sequoia- Kings Canyon National Park	Shenandoah National Park	Yosemite National Park
Are detection and/or suppression systems used and tested?	Limited ^a	No	Limited ^a	Limited ^a	No	Limited ^a
Are fire brigades qualified and equipped?	b	b	No	No	No	No
Are agreements with local fire department(s) coordinated?	No	No	Limited ^c	Yes	Limited ^c	Yes

^a Limited = In the four cited parks, fire detection and/or suppression systems are installed and tested in some but not all park buildings.

Funding

Fire experts generally agree that sufficient, consistent funding is necessary to support an effective structural fire safety effort. However, there is no specific appropriation dedicated to structural fire activities in the Park Service. Individual park managers are permitted to determine the funding levels, if any, for structural fire activities. Park managers at the six parks we visited acknowledged that structural fire safety activities received insufficient funding.

^b Not applicable. Park unit does not have a fire brigade.

^c At Shenandoah National Park, a draft agreement is in process with one of the local fire departments. At Olympic National Park, agreements have been reached with only two of nine fire districts surrounding the park.

Internal Park Service Analyses Identified Similar Problems

Our findings on the gaps and problems in the parks' structural fire safety efforts appear to be consistent with the Park Service's own analyses. Specifically:

- A 1998 Park Service report stated, "sooner or later the NPS stands to be seriously embarrassed (at a minimum) by the catastrophic loss, either of an irreplaceable historic structure or collection, or of human life, from a structural fire." ⁵
- In December 1997, the Director of the Park Service expressed serious concerns about 1,900 fire safety deficiencies involving the agency's museum collections. Yet, as of January 2000—over 2 years later—almost 75 percent of these deficiencies have not been corrected. According to the director, "These deficiencies can be corrected at a modest cost. ...To do otherwise would be negligence." The deficiencies concerned things like the storing of flammable liquids and materials near museum storage spaces, not inspecting and maintaining fire detection and suppression systems on a regular schedule, and not inspecting fire extinguishers annually.

Highlights of the fire safety problems at each of the six parks we visited can be found in appendix II.

Key Reasons for the Agency's Ineffective Structural Fire Effort

The parks we visited lacked an effective structural fire safety effort because the agency (1) has not fully specified the minimum structural fire safety standards individual parks must meet and (2) has placed little emphasis on structural fire safety. As a result, managers at these parks gave this aspect of operations a low priority. This low priority is inconsistent with Park Service assertions that health and safety issues are a top agency priority.

Currently, the Park Service provides park managers with a generalized policy on what their fire safety efforts should include. However, the policy does not require parks to meet minimum fire safety standards. It places primary responsibility for daily management and compliance for structural fire safety with individual park managers. The objectives of the policy are to prevent the loss of human life and prevent damage to and destruction of

⁵Review of National Fire, Aviation and Emergency Response, National Park Service (May 18, 1998).

real property and resources. The policy emphasizes that the most effective means of protecting human life, property, and resources at the park level is fire prevention, including the installation of automatic fire detection devices and automatic fire-extinguishing systems (sprinkler systems). The extent to which such activities are implemented at each park, however, depends on how individual park managers define the scope, priority, and emphasis given to structural fire safety efforts.

While the policy places primary responsibility on park managers to carry out structural fire safety activities, little support for the effort appears to exist at the headquarters or regional levels. According to a 1998 internal Park Service study, "The degree to which structural fire capability is addressed in each park appears to be largely dependent on the personal interest of either the Superintendent or Chief Ranger." Although the Park Service tried to emphasize structural fire safety by appointing an agencywide Structural Fire Chief in 1990, according to the agency's 1998 internal study,

"Nearly everyone interviewed, including the (Structural Fire Chief) himself, concluded that little progress has been, nor is being made in structural fire management in the NPS [National Park Service]. ... There is widespread agreement that the structural fire program in the NPS lacks priority and emphasis."

Furthermore, this same 1998 study observed,

"Any resemblance of the NPS structural fire program to one that is coordinated and effective continues to be obscure. There is little acknowledgement at the WASO [headquarters] level of the structural fire program. At the regional and support office level, variable emphasis (from none to some) is given to the program."

Not much has changed since the study was completed in 1998. While existing structural fire policy recommends that each region appoint a structural fire safety coordinator, none of the Park Service's seven regional offices have done so, according to NPS' Structural Fire Chief. As a result, very little help or support is available to individual parks concerning structural fires. In addition, unlike other federal agencies that have fire protection engineers reviewing construction and renovation projects, such as the General Services Administration and the Department of Energy, the Park Service has no process for ensuring that plans for renovating existing facilities or constructing new structures is routinely reviewed for fire safety. While the Park Service has a safety engineer with the qualifications and expertise to review building plans for compliance with structural fire safety requirements, this individual reviews only a small portion of the

projects designed by the agency's construction arm in Denver, Colorado—called the Denver Service Center. This occurs because the Denver Service Center is limited to performing design work for only 10 percent of the agency's major construction projects. Design work for the other 90 percent of the projects is performed by outside architect-engineering firms.

The lack of agency attention to structural fire seems inconsistent with the Department of the Interior's and the Park Service's statements that addressing unmet health and safety concerns is a top priority. On April 30, 1999, the Department of the Interior provided its component agencies including the Park Service—with guidance that identified health and safety issues as a top funding priority. This guidance explicitly identifies violations of national fire protection standards as requiring immediate attention. Furthermore, the Park Service's fiscal year 2001 annual performance plan stresses that employee and visitor health and safety are top agency priorities. For example, a key agency goal concerning employee and visitor safety states, "The [National Park Service] has a responsibility to maintain a safe and healthful working environment, promote safe work practices, and provide a safe recreation experience for visitors." In addition, another agency goal states, "Visitor safety is a priority function within parks and integral to fulfilling the [National Park Service's] mission to provide for the public enjoyment of the national parks." However, in the case of structural fire safety, the Park Service's practices and activities do not seem consistent with this policy.

The Agency Has
Launched Initiatives to
Address Problems, but
Practical Results
Depend on Effective
Implementation

The Park Service is aware that there are major weaknesses in its structural fire safety effort and has begun a number of initiatives to address them. It is unclear, however, whether the Park Service will follow through on these initiatives to ensure that an effective structural fire safety program is developed and implemented.

The Agency Has Begun Several Initiatives to Address Structural Fire Safety Problems

Park Service officials are aware that structural fire safety has been reduced to a low priority at many parks, and the agency has begun a number of initiatives to revitalize and improve its effort. In 1998, the agency appointed a structural fire safety steering committee, which drafted a fire management policy and mission statement. These documents defined the

purpose, scope, and general policy toward structural fire in the agency. Also in 1999, the Park Service hired a new structural fire chief and directed the individual to develop an agencywide structural fire safety program. This program is now being developed and consists of five major components: (1) Director's Order No. 58 on Structural Fire, (2) structural fire inspection and analysis, (3) fire code compliance for new construction and renovation projects, (4) data collection, and (5) program development. Table 3 lists these initiatives, their intended accomplishments, their activities, and their current status.

Table 3: Status of Key Park Service Structural Fire Initiatives

Initiative	Purpose	Description	Progress to date	
Director's Order No. 58 Structural Fire	 Establishes an agencywide structural fire program with responsibilities at the national, regional, and park levels. Sets specific requirements at each park for structural fire safety, including compliance with national life and fire safety codes. 	 Requires a structural fire program throughout the agency. Specifies the objectives, legal authority, policies and procedures, and program requirements for structural fire. Adopts National Fire Protection Association's guidelines and codes. Emphasizes fire prevention through compliance with fire codes and periodic testing of fire protection systems and equipment. Sets training and certification standards for fire prevention, fire protection, and program management. 	Director's order expected to be issued by September 2000.	
Initiative	Purpose	Description	Progress to date	
Structural fire inspection and analysis	 Develops a structural fire building inspection and analysis process. Will result in an agencywide priority list of structural fire deficiencies. 	 Comprehensive fire inspection process to identify structural fire deficiencies and priorities. Ranking of buildings and parks relative to structural fire deficiencies. Ranking of individual parks in terms of structural fire risk. Identifying buildings and parks at risk to structural fire. 	 Completion of the development of fire inspection process estimated by June 2000. Park-by-park inspections contingent on additional funding. 	
Fire code compliance for new construction and renovation projects	Will ensure that qualified personnel review all projects for compliance with structural fire requirements.	Building design and review procedures to ensure that all new construction and building renovation and rehabilitation projects comply will applicable fire and life safety codes.	Under development.	
Data collection	Compiles agencywide data on key components of parks' structural fire safety efforts.	 Collects agencywide data on structural fire incidents, employee fire training records, structural fire agreements with non-NPS entities, and inventory of structural fire engines. 	Ongoing.	

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- Program development
- Identifies how the agencywide structural fire program would operate and identifies required resources.
- Develops preliminary structure for an agencywide structural fire program.
- Establishes implementation plans and identifies required resources.
- Completion expected by June 2000.

Such initiatives, once implemented, are likely to increase the level of structural fire prevention and response over that currently in place. According to the Structural Fire Chief, these initiatives would first identify buildings with the most structural fire deficiencies both within individual parks and on a park-by-park basis. Thus, the agency could assess where the most serious gaps in structural fire safety exist and target funds to those areas most at risk. Second, a Director's Order, when implemented, would establish a structural fire program at the national and regional levels and would require park managers to begin implementing the components for an improved structural fire effort. In the longer term, all new construction and major renovation projects would be required to comply with national life and fire safety codes, including, and where appropriate, the installation of fire detection and sprinkler systems. Over time, such initiatives would shift the agency's focus from one that currently emphasizes fire response to one that emphasizes fire prevention—an approach that, according to the Structural Fire Chief, is much more cost-effective.

Results Will Depend on Effective Implementation

While the initiatives under way are certainly steps in the right direction, their success depends on their being effectively implemented. However, we identified several troubling signs that raise doubts about whether this implementation will occur.

First, outside of the Park Service's Structural Fire Chief, no other full-time employee is devoted to managing the agency's structural fire safety effort. All other agency staff at the regional levels assisting with structural fire initiatives are part-time. Even the current salary of the Structural Fire Chief is not paid from funds dedicated to managing the structural fire safety effort but, temporarily, with funds from a different program within the agency. These conditions suggest that the agency's structural fire safety effort will continue to suffer from the low priority that has characterized it in the past.

Furthermore, it appears that the planned levels of resources for these structural fire safety initiatives will not be sufficient to get several key initiatives completed, including one of the agency's most critical efforts—completing an overall assessment of the structural fire risks facing facilities

and structures throughout the Park Service. According to Park Service officials, no funding is planned for the agency's structural fire safety effort in the agency's fiscal year 2001 budget request. At the same time, however, this budget request asks for a \$24 million increase in funding for a variety of operational needs. According to the budget justification, this additional \$24 million is for the highest priority operational needs identified by park managers. However, none of it is for addressing structural fire safety needs. In our view, this raises questions about the agency's commitment to its structural fire safety needs.

In addition, according to the Structural Fire Chief, unless additional resources are devoted to the agency's structural fire safety effort by June 2000, its improvement initiatives will essentially grind to a halt. Plans for a thorough fire inspection of the Park Service's facilities and plans for new training will be placed on hold awaiting additional resources. Under these circumstances, developing and implementing an effective structural fire safety effort is, at best, a long-term effort, if it happens at all.

Conclusions

One of the Park Service's core responsibilities is to protect and preserve the vast array of natural and cultural resources under its care and to provide a healthy and safe environment for the millions of people who visit the parks annually. However, when it comes to structural fire safety, the agency is not meeting its responsibilities. Today, even after more than 80 years in existence and even with the continuing growth and increasing popularity of the national park system, the Park Service still has not completed a risk assessment of structural fire safety and thus does not know the scope or severity of the structural fire risks throughout the system or what is necessary to address these risks. As a result, the safety of park visitors, employees, buildings and artifacts are being jeopardized: They are vulnerable to fire that could cause damage, destruction, and severe injury and even the loss of life.

If health and safety are a top priority, as has been asserted by senior agency officials, then it is apparent that the agency should give higher priority to its structural fire safety effort. The broad discretion that local park managers now have over funding decisions and the low priority that many park managers have assigned to fire safety suggest that additional steps are needed to ensure that parks throughout the system implement effective and coordinated fire safety efforts and correct the fire safety deficiencies that now exist. In short, the agency needs to require park managers to develop and implement effective fire safety efforts and to correct existing

fire safety deficiencies. To accomplish this, the conditions that exist in the agency today must change—park managers need to be held more accountable for ensuring that the parks and the people in them are provided a healthy and safe environment.

We recognize that if the agency makes the priority of the structural fire safety effort consistent with its stated health and safety goals, resources will likely have to be diverted from other competing priorities within the agency. The trade-offs that will have to be made by the Park Service's leadership and individual park managers will be difficult. However, to do less will be to continue to jeopardize the health and safety of park visitors and employees and threaten many of the resources the agency is responsible for protecting.

Recommendations

In order to enable the Park Service to meet its structural fire safety responsibilities, we recommend that the Secretary of the Interior require the Director of the Park Service to complete and implement in a timely manner the structural fire safety initiatives now under way in the agency. At a minimum, this should include

- establishing minimum structural fire safety requirements throughout the park system,
- providing for a fire safety risk assessment at each unit of the park system to systematically identify fire safety needs and deficiencies,
- developing and implementing a plan for correcting the identified needs and deficiencies in a timely manner,
- establishing a process for ensuring that all new construction and major rehabilitation projects are reviewed for compliance with generally accepted fire codes by personnel qualified to do so, and
- providing the employee training needed to accomplish the four preceding tasks.

Furthermore, to ensure that local park managers elevate the priority given to addressing structural fire safety needs and deficiencies, we recommend that the Secretary of the Interior require the Director of the Park Service to hold park managers accountable for meeting the agency's health and safety responsibilities by requiring them to develop and implement effective structural fire safety programs. In doing this, it is important that specific deadlines are set for implementing these programs.

Agency Comments and Our Evaluation

The Department of the Interior agreed with the overall findings of the report and stated that it accurately reflects the general status of structural fire safety issues in the Park Service. Its letter commenting on the report appears in appendix III. The enclosure to this letter made several technical and clarifying comments, which we incorporated into the report as appropriate. In its concluding comments, the Department of the Interior said, "Only by implementing an agencywide building inspection and analysis program will the NPS be able to identify the scope of its structural fire deficiencies. With information provided by this program we will be able to estimate the financial requirements necessary to meet the NPS fire safety responsibilities." In addition, after we received the Department's comments, the Acting Associate Director, Park Operations and Education, told us that the Park Service agrees with the report's conclusions and recommendations and is considering plans to implement the recommendations.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 5 days from the date of this letter. At that time, we will send copies of this report to interested congressional committees; the Honorable Bruce Babbitt, the Secretary of the Interior; the Honorable Robert G. Stanton, Director of the National Park Service; the Honorable Jacob J. Lew, Director, Office of Management and Budget; and other interested parties. We will also make copies available to others upon request.

If you or your staff have any questions about this report, please call me at (202) 512-3841. Key contributors to this report were Lloyd Adams, Brian Estes, Cliff Fowler, Frank Kovalak, and Paul Staley.

Sincerely yours,

Jim Wells,

Director, Energy, Resources,

Lion Wells

and Science Issues

Scope and Methodology

To determine whether parks are effectively addressing their structural fire responsibilities, we contacted various national fire associations to determine what generally recognized fire experts consider to be the key elements of any structural fire effort. We contacted officials from the California Department of Forestry, Colonial Williamsburg Foundation, Fire Safety Institute, National Association of State Fire Marshals, National Fire Protection Association, and the U.S. Fire Administration. In addition, we met with officials from the General Services Administration and the Department of Energy, as well as several community fire departments. We compared the fire experts' list of the key elements of an effective structural fire safety program with the structural fire safety activities at six parks to identify any differences. The six parks visited were the Ford's Theatre National Historic Site in Washington, D.C., Olympic National Park in Washington state, Prince William Forest Park in Virginia, Sequoia-Kings Canyon National Park in California, Shenandoah National Park in Virginia, and Yosemite National Park in California. We visited and interviewed park superintendents and other field officials at these parks. These six parks were selected to provide geographic coverage and a cross-section of the types of natural and historic parks administered by the agency. While these parks may not be statistically representative of the national park system as a whole, agency officials told us the structural fire safety activities we reviewed at the six parks were not likely to differ substantially from such activities at most parks. In addition, we contacted Park Service officials at various headquarters offices and three regional offices. We also met with the Park Service's current Structural Fire Chief.

To determine why these parks may not have effectively carried out their structural fire safety responsibilities, we reviewed the Park Service's policies, procedures, and guidance concerning structural fire and discussed the agency's procedures with headquarters, regional, and park unit officials. We also reviewed the Park Service's past reviews of its structural fire safety activities.

To determine what improvements the Park Service has underway to improve its structural fire safety effort, we obtained and reviewed the agency's initiatives in process and discussed these initiatives with the Park Service's headquarters officials and its structural fire chief.

We conducted our review from December 1999 through May 2000 in accordance with generally accepted government auditing standards.

We selected six parks to determine the effectiveness of their structural fire safety activities. This report shows that these six parks generally lacked many of the key elements of an effective structural fire safety effort. This appendix highlights the types of fire safety problems we found during our visits to these parks.

Ford's Theatre National Historic Site

Ford's Theatre National Historic Site, located in Washington, D.C., consists of both the Ford's Theatre complex, where President Abraham Lincoln was assassinated, and the Petersen House—where President Lincoln died—a building directly across the street from the theatre. There is also a museum beneath the theatre that contains portions of the Olroyd Collection of Lincolniana, including the pistol that was used to shoot President Lincoln. The site receives about 1.1 million visitors annually.

Key Fire-Related Issues

- In 1993, an independent fire safety expert was concerned about the structural fire integrity of Ford's Theatre and the adequacy of all installed fire protection and detection systems. He recommended that the Park Service contract with a qualified fire protection engineer to conduct a thorough evaluation of the site. (The fire expert found two of the major deficiencies listed below.) Seven years later, this recommendation has not been carried out.
- The Park Service has not given a high priority to funding long-standing fire-related problems at this historic site. The agency estimates that \$1.5 million is needed to address these problems, including a new stage lighting system at Ford's Theatre and a fire suppression system at the Petersen House.
- This historic site does not have an adequate fire prevention and protection effort. As a result, the thousands of visitors that annually tour the site and the historic site itself are at risk. It lacks routine fire inspections done by qualified personnel.

Fire Prevention/Protection Deficiencies

- We observed that a theatre stage door with a 3-inch gap on the bottom
 when closed had wires running under it. Keeping the stage door tightly
 closed is critical to preventing a fire in the stage area from spreading to
 the rest of the auditorium.
- Similarly, an automatic smoke damper in the attic was obstructed by stage production lighting cables, which defeat the whole purpose of the

- fire wall and could result in the spread of a fire on the stage to attic segments above the seating areas.
- Boxes are stored within only a few inches of the sprinkler heads in a basement area directly beneath theatre offices. The failure to maintain a minimum clearance of 18 inches below the heads of automatic sprinkler systems limits the effectiveness of the sprinkler system. (See fig. 4.)



Figure 4: Boxes Impeding Effectiveness of Fire Sprinkler in Storage Area of Theatre's Basement

- Padlocks mounted on three of the upstairs rooms (wardrobe, dressing, and main performer) would trap persons if the doors were locked accidentally.
- After we questioned the Washington, D.C. Fire Department about whether it routinely inspects this historic site, they conducted an inspection. The inspection was done on April 18, 2000. The fire department found over 50 fire safety violations at Ford's Theatre, including (1) rain leaking on a lighted fire exit while many tourists were touring the facility, (2) an annunciation panel used to monitor whether fire alarms and smoke alarms were functioning was not functioning; its "power on" and "trouble lights" were burned out, and (3) exit obstructions and the lack of proper exit signs.

Fire Response Deficiencies

- The historic Petersen House does not have a fire sprinkler system. An architect-engineering firm is currently designing a fire suppression system for the building.
- The District of Columbia's Fire Department found that an obstruction at the rear of the theatre would prevent a fire truck from hooking its hoses to an outside water source.

Olympic National Park

Olympic National Park, located in northwest Washington state, consists of about 900,000 acres of diverse resources, including glaciers, valleys, lakes, ocean beaches and a temperate rain forest. The park has hundreds of miles of hiking trails and attracts about 4 million visitors each year. The park has about 500 buildings, including 3 visitor centers, and offers lodges, cabins, and motel-like structures in four separate locations.

Key Fire-Related Issues

- The park has given a low priority and little commitment to addressing structural fires and the park does not have a structural fire safety effort.
- The park does not have a dedicated person responsible for structural fire-related safety activities.
- The park has no funds budgeted for structural fire safety activities.
- Inadequate fire prevention and response capability place visitors, employees, and park buildings and their contents at risk.
- Several fire-risk assessments of the park, some as early as 1992, found
 many deficiencies and fire-related concerns and suggested actions for
 addressing the problems. However, many of the same deficiencies and
 concerns continue today.

Fire Prevention/Protection Deficiencies

- Most buildings in the park do not have fire-sprinkler systems; only four of the approximately 500 Park Service structures have such systems.
- Insufficient smoke detectors and testing of detectors.
- The park does not have formal structural fire inspections for park buildings.
- Several important museum collections and historic structures have no fire detection or sprinkler systems. A 1999 fire inspection by a General Services Administration regional fire protection engineer recommended installing numerous buildings with fire detection and suppression systems.
- The lack of a second set of stairs for egress in two multistory park buildings places employees at fire risk.
- Inspections by nearby city fire departments identified park structures, if
 not located within the park, would be in violation of numerous codes,
 including some buildings that would be required to have sprinkler
 systems. The inspections by the city's fire department were within 15
 months of a fire safety review by park officials.

Fire Response Capability Deficiencies

- The park has no structural fire fighting training program.
- The park has no structural fire response capability; the park's wildland fire crew and equipment would be used to fight structure fires only from the exterior of buildings.
- The park has cooperative fire response agreements with only two of nine surrounding area fire departments. One fire district, however, refuses to respond to fire incidents in one area of the park, resulting in the lack of structural fire protection for about 90 owners of private land within the park's boundaries.

Prince William Forest Park

Prince William Forest Park contains about 17,000 acres and is located near the city of Triangle in Prince William County, Virginia—about 32 miles south of Washington, D.C. The park preserves the largest example of a Piedmont forest ecosystem in the National Park Service. The park also offers a variety of recreational opportunities, including hiking, fishing, picnicking, wildlife-and bird-watching, and camping. It contains over 250 structures, including about 100 National Register Civilian Conservation Corps 1930s-era primitive sleeping cabins. Including nonhistoric structures, the park can house about 700 campers. The park received about 150,000 visitors in 1999.

Key Fire-Related Issues

- The park contains about 115 wooden cabins, which lack smoke
 detectors and fire extinguishers. The park has been reluctant to install
 detectors because park officials believe that campers would remove the
 batteries. Yet, since the camp units already have electricity, they could
 easily be hard-wired, and/or inexpensive plastic protective covers could
 be installed over the detectors to prevent tampering.
- The park has not had a qualified structural fire inspection of its facilities.
 In March 2000, the park began to use a nearby military fire inspector on an informal arrangement.

Fire Prevention/Protection Deficiencies

 A March 2000, inspection, by a military fire inspector, found several firerelated problems, including the need to provide (1) additional smoke detectors and fire extinguishers; (2) telephones for emergency notifications; and (3) a fire suppression system for a kitchen grill. The inspection also recommended that a qualified contractor annually test the fire alarm system in the maintenance office.

Fire Response Deficiencies

Although the park has low water pressure, a local fire department
official told us that the fire department would be able to respond with
tank trucks to assist in any fire suppression activity. However, the
official had not seen the park's structural fire plan that was developed
internally by the park staff.

Sequoia-Kings Canyon National Park

Sequoia-Kings Canyon National Park, located in central California east of the city of Fresno, consists of about 864,000 acres of deep canyons and high alpine peaks in the Sierra Nevada Mountains and some 75 groves of giant sequoia trees. The park is also home to the 14,494-foot Mt. Whitney—the highest peak in the contiguous United States. The park has over 250 structures, including 3 visitor centers. There is one lodging accommodation in Sequoia and three lodging areas in Kings Canyon. Two of the four lodging areas are closed during the winter.

Key Fire-Related Issues

- The park's first fire plan was developed in 1999, however, according to park officials, there is insufficient funding to implement the fire plan.
- During the last 5 years, the park acquired fire trucks and other apparatus, but the park's firefighters do not meet minimum training requirements.

Fire Prevention/Protection Deficiencies

- There have been no formal structural fire inspections of the park's buildings.
- There has been minimal use of fire detection and sprinkler systems throughout the park. Where fire detection or sprinkler systems have been installed, they have not been inspected and tested.
- The park does have an independent contractor to inspect the park's fire extinguishers.
- Park Service investigation of a March 2000 fire at the newly constructed (1999) John Muir Lodge noted several fire-safety deficiencies including the lack of a tamper-proof alarm for the sprinkler system, the absence of a back-flow device to protect the domestic water system from being contaminated in the event that fire crews must use the water line, and the failure to connect the lodge's audible fire alarm to a monitoring source.

Fire Response Deficiencies

- Fire hydrants throughout the park are not tested for water pressure.
- All park fire brigade members are volunteers; there are no full-time structural fire personnel.
- Inadequately trained firefighters respond to structural fire incidents.
- Park records, for structural fire-fighting training, show that only 2 of 37 fire brigade members have had re-certification training with breathing apparatuses for interior structural fires. Park officials said that very few

- firefighters have met the annual minimum number of training hours for structural fire-fighting.
- The park has had 41 structural fires since 1988, but the fires have not been reported to a national-incident reporting database.

Shenandoah National Park

Shenandoah National Park, located in Northwest Virginia, contains the 105-mile Skyline Drive, which winds along the crest of the scenic Blue Ridge Mountains. The park has hundreds of miles of hiking trails including about 100 miles of the Appalachian Trail and attracts about 2 million visitors a year. This 196,000-acre park has over 300 buildings, including 3 visitor centers, and offers lodging accommodations in a historic lodge, cabins, and several motel-type-lodging facilities.

Key Fire-Related Issues

- The park has given a low priority and little commitment to addressing structural fires.
- The park does not have a dedicated person responsible for structural fire-related activities. A person responsible for wildland fires spends about 10 percent of his time on structural fire activities.
- The park has committed very limited funding for structural fire activities, including fire prevention and fire response.
- Several fire-risk assessments of the park in the past 9 years have found many deficiencies and fire-related concerns and have suggested actions for addressing the problems. However, many of the same deficiencies and concerns continue today.

Fire Prevention/Protection Deficiencies

- In developing a National Park Service structural fire inspection and assessment survey, in February 2000, the Park Service's Structural Fire Chief identified 18 fire-related problems in the Byrd Visitor Center, including fire extinguishers that were not inspected since 1996, employees who were not instructed on the use of fire extinguishers, and the lack of emergency exit lights.
- In the basement of the Panorama Visitor Center, several park employees
 work in offices with cedar shake wooden material that is highly
 combustible. However, these offices do not have smoke detectors and
 lack sufficient egress; that is, only one exit route exists.
- In April 1998, a comprehensive safety review of the park found many instances that expose employees to potential fire hazards (e.g., a flammable storage locker in the paint shop, exits that are not clearly marked and partially blocked in the sign shop, and combustible materials that are not properly stored in the welding shop.)

Fire Response Capability Deficiencies

• The fire response capability in the park is limited. The park does not have qualified personnel to respond to structural fires.

- The park has a collateral duty fire brigade that can neither attack the interior of a burning building nor has the capability for rescuing persons in the building. The brigade lacks adequate training and even lacks necessary equipment to respond to vehicle fires. The park's policy is to rely on local fire departments for interior fire suppression. However, the response times for the various local fire departments, according to park officials, ranges from 10 to over 45 minutes. A much shorter response time—4 to 6 minutes—is needed to respond in order to save a building.
- The extent that fire detection and suppression systems should be installed in park facilities is unknown. No one coordinates efforts to obtain suppression equipment in hotels, occupied structures, or historic structures. Several past fire-risk assessments have identified the need to have such systems installed, regularly inspected, and tested in several buildings. The park is installing such systems in some of its facilities.
- The 1998 renovation of the Byrd Visitor Center, cost about \$150,000, but did not include the installation of a sprinkler system because of limited funds for the renovation. The cost to install a fire suppression was estimated to be more than \$40,000.¹ According to a local fire department and emergency services official, such a system would appear to be justified because the park brigade is not equipped to provide an interior fire attack and the long time that local fire departments would take to respond to a fire—as much as 15 to 20 minutes.

¹According to the Park Service Director's Order 50B, sprinkler systems may be omitted in a renovation if the cost of the sprinkler system exceeds 20 percent of the total renovation cost.

Yosemite National Park

Yosemite National Park, located near the eastern border of central California, comprises about 750,000 acres. The park includes 263 miles of roads and 800 miles of hiking trails. Nearly 4 million visitors come to the park annually. There are about 800 Park Service structures in the park, including 4 visitor centers. Lodging in the park includes two national historic landmark hotels, the Ahwahnee Hotel in Yosemite Valley and the Wawona Hotel—near the southern entrance to the park. There are lodging facilities in six other areas of the park, including several high country sites.

Key Fire-Related Issues

- Historically, the park has given a low priority and little commitment to addressing structural fires.
- The park has committed very limited funding for structural fire activities.
- In 1999, the park added a structural fire inspector to begin formal structural fire inspections of the park's 800 buildings.
- Fire prevention is inadequate, putting visitors, employees, and park buildings and their contents at risk. There have been over 100 structural fire incidents in the park since 1990.
- A fire-risk assessment of the park in the 1990s found many deficiencies and fire-related concerns and suggested actions for addressing the problems. Many of the same deficiencies and concerns continue today.

Fire Prevention/Protection Deficiencies

- The existing structural fire plan is dated 1984; an updated fire plan has not been implemented.
- A 1992 independent assessment of the security and fire protection of the park's museum collection, library, and other facilities noted inadequacies in fire-detection and fire-suppression systems. Many of the deficiencies remain uncorrected.
- The park's dispatch center for fire and law enforcement incidents has
 missing or not properly illuminated emergency and fire exit signs for
 emergency egress, emergency window exits do not have appropriate
 exit ladders, extension cords are prevalent because of insufficient
 electrical outlets, and the fire alarm system works only intermittently.
- There have been no formal structural fire inspections of the park's 800 structures, including the 123-room Ahwahnee Hotel—a designated national historic landmark. (See fig. 5.) There is only one egress route from several upper floors of the hotel. The smoke alarm system is over 20 years old, and replacement parts are no longer available. The source of frequent false alarms is unknown, and the system does not allow fire

- protection officials to locate the source of actual fires for timely response.
- There is minimal use of fire detection and sprinkler systems throughout the park. Where fire detection or sprinkler systems have been installed, they have not been inspected and tested.
- The park has no inventory of fire extinguishers or any independent inspection of fire extinguishers.
- The park did not participate in a manufacturer's nationwide recall effort for defective sprinkler heads. The park has about 1,000 of these defective sprinkler heads installed in park buildings. According to the U.S. Consumer Product Safety Commission, identical sprinkler heads have failed to function in at least 20 fires.

Fire Response Deficiencies

The park has one of the largest fire organizations in the agency; however, very few fire brigade firefighters have sufficient training for structural fires. In 1999, over 90 percent of the firefighters stationed in Yosemite Valley had less than the 16 hours of minimum required annual training or had no record of any training.



Figure 5: The Ahwahnee Hotel in Yosemite National Park

Comments From the Department of the Interior



United States Department of the Interior

OFFICE OF THE SECRETARY Washington, D.C. 20240

MAY 1 7 2000

Mr. Jim Wells
Director, Energy, Resources
and Science Issues
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Wells:

The Department of the Interior has reviewed the General Accounting Office's (GAO) draft report entitled "PARK SERVICE: Agency Is Not Meeting Its Fire Safety Responsibilities" (GAO/RCED-00-154) (GAO code 141403).

Overall, we found that the draft report accurately reflects the general status of issues in the National Park Service (NPS) structural fire program. The enclosed comments are being made to ensure accuracy of the report.

Thank you for the opportunity to review and comment on this draft report.

Sincerely,

Assistant Secretary for Fish and Wildlife and Par

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