

1.0 Introduction

1.1 Background

At approximately 1:20 p.m. on June 27, 2000, two motor vehicles collided in a fatal accident on Washington State Route (SR) 24, adjacent to the northwestern border of the U.S. Department of Energy (DOE) Hanford Site. Vehicle fuel tanks ruptured and fuel ignited, resulting in a fire that quickly involved the vegetation on both sides of the highway.

Before it was contained on July 1, the 24 Command Wildland Fire charred nearly 164,000 acres of land both on and off the Hanford Site. The fire burned at an average rate of 2,000 acres per hour; further, in one 90-minute period, it traveled 20 miles. More than 900 firefighters from multiple agencies ultimately were involved in the event, supported by 200 pieces of firefighting apparatus, including dozens of bulldozers and other heavy equipment. Two helicopters and five air tankers dumped countless loads of water and retardant on the fire.

In addition to the firefighters, the event involved hundreds of Hanford personnel from the DOE Richland Operations Office (RL) and Office of River Protection (ORP), as well as numerous contractor organizations on the Hanford Site. Their efforts focused on emergency response, radiological control and monitoring, and ensuring security and safety for site personnel and assets.

On June 30, the RL Manager established a Type B accident investigation board (Board) in accordance with DOE Order 225.1A, *Accident Investigations*, to assess the responses of DOE and its Hanford Site contractors to the fire (Appendix A).



Hanford Fire Department emergency responders at accident scene

1.2 Site Description

The Hanford Site in southeastern Washington State is adjacent to the Columbia River, which forms the site's northern and eastern boundaries. The western boundary is atop the ridge of Rattlesnake Mountain, a large, treeless basalt mountain. Elevation on the Site ranges from 400 feet at the Columbia River to 3,630 feet at the summit of Rattlesnake Mountain. Immediately to the south of the Site is the city of Richland. Adjacent to or near the Site are the cities of West Richland, Benton City, and Kennewick (all in Benton County). Across the Columbia River and to the southeast is the city of Pasco (in Franklin County).

The Site's landscape is shrub-steppe, largely sand and sagebrush, with an average annual precipitation of 6.26 inches (per Hanford Meteorological Station records). The Hanford Site also encompasses the Fitzner-Eberhardt Arid Lands Ecology (ALE) Reserve, a 120-square-mile area to the southwest of the central Site. The ALE Reserve, managed by the U.S. Fish and Wildlife Service (FWS), was designated a part of the Hanford Reach National Monument on June 9, 2000.

Since the 1940s when it was created as part of the Manhattan Project, Hanford has played a pivotal role in U.S. national defense as a plutonium production complex. Today, the Site is engaged in a new mission—environmental cleanup. Under contract to RL and ORP, multiple private-sector companies are working at Hanford to safely clean up and manage the Site's legacy wastes. The current Hanford workforce is approximately 10,600 personnel.



1.3 Investigation Scope, Conduct, and Methodology

The scope of the Board's investigation, as established by the RL Manager's June 30 memorandum, was to review and analyze DOE and contractor response to the 24 Command Wildland Fire. The Board was to explore the emergency response process of Hanford resources and the application of lessons learned from previous fires at Hanford. The Board was instructed to place specific emphasis on "... any further lessons learned that can be applied to improving the DOE response to a fire incident, not just at Richland, but that might also be applicable to other DOE sites."

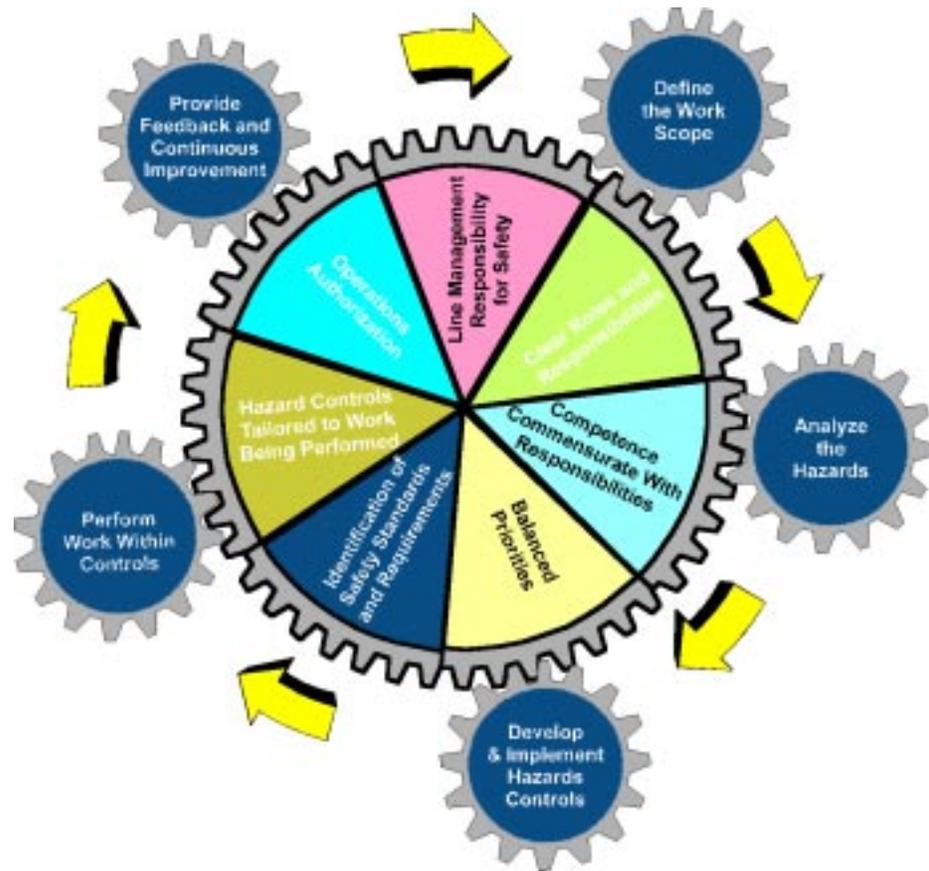
The investigation covered the full response of RL and Hanford emergency response personnel and organizations, including direct response to the fire, actions of the emergency operations process, Hanford Patrol activities, external interfaces and communications, radiological monitoring, and Hanford support roles. The scope of the investigation also was limited to those times and events directly controlled by Hanford personnel or which involved their direct participation.

The Board used the following methodology to conduct its investigation:

- collecting the facts relevant to the event through interviews with event participants and witnesses, reviews of event records and procedures, first-hand observation of locations critical to understanding the conditions and progress of the fire, reviews of audio tapes of communications during the event, and examination of photographs taken during and after the event
- correlating and analyzing the facts through barrier analysis, change analysis, and event and causal factors charting
- analyzing the safety management processes and controls using the core functions and guiding principles of the DOE Integrated Safety Management System (ISMS)
- developing conclusions and judgments of need, based on analysis of the data, for corrective actions addressing opportunities for improvement
- performing a tier analysis and a root cause evaluation on the conclusions, to direct the identified needs to the appropriate management level for resolution.



Fire near 400 Area on Hanford Site



Accident Investigation Terminology

A **causal factor** is an event or condition in the accident sequence that contributes to the unwanted result. There are three types of causal factors: direct cause, which is the immediate event(s) or condition(s) that caused the accident; root cause(s), which is (are) the causal factor(s) that, if corrected, would prevent recurrence of the accident; and contributing causes, which are causal factors that collectively with other causes increase the likelihood of an accident, but that individually did not cause the accident.

Events and causal factors analysis includes charting, which depicts the logical sequence of events and conditions (causal factors) that allowed the event to occur, and the use of deductive reasoning to determine events or conditions that contributed to the accident.

Barrier analysis reviews hazards, the targets (people or objects) of the hazards, and the controls or barriers that management systems put in place to separate the hazards from the targets. Barriers may be physical or management.

Change analysis is a systematic approach that examines planned or unplanned changes in a system that caused undesirable results related to the accident.