2009 SAFENET Review

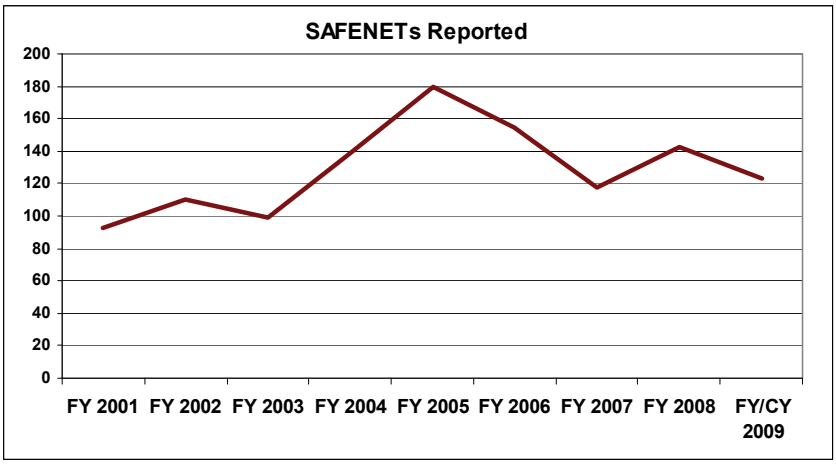
Introduction

The SAFENET program was created and established during the 2000 fire season in response to a recommendation from Phase III of the TriData Wildland Fire Safety Awareness Study. It serves as a method for reporting and resolving health and safety concerns encountered in wildland fire, prescribed fire, wildland fire training, fitness testing, fuels treatments and all hazard incidents involving wildland fire personnel. The data collected through the SAFENET program also helps to identify short and long term trends and problem areas. The SAFENET database is sponsored by the National Wildfire Coordinating Group (NWCG).

The NWCG Risk Management Committee (formerly known as the Safety & Health Working Team) is responsible for the management of the SAFENET program. In keeping with other NWCG annual reports, the decision was made to change the annual SAFENET review from a fiscal year to a calendar year basis. As a result, this summary will cover FY 2009 and CY 2009 (October 1, 2008 through December 31, 2009).

There was a decrease in the number of SAFENETS submitted in 2009. This could be attributed to the relatively slow fire season in much of the United States during 2009. The following table and graph shows the annual number of SAFENETs filed since its establishment in 2000.

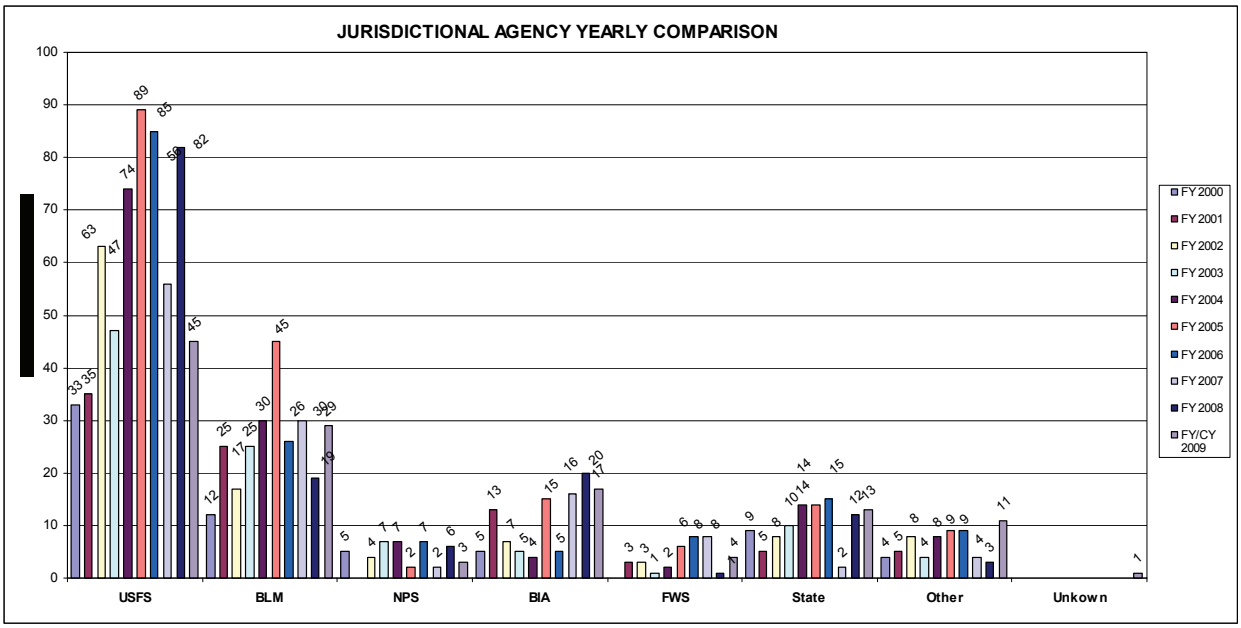
Total SAFENETs Filed	
FY 2000	68
FY 2001	93
FY 2002	110
FY 2003	99
FY 2004	139
FY 2005	180
FY 2006	155
FY 2007	118
FY 2008	143
FY/CY 2009	123



What Happens to a SAFENET?

After a wildland firefighter submits a SAFENET, it is forwarded to the national fire management safety program manager for the jurisdictional agency identified in the submission. In addition to the five federal land management agencies, a state representative is identified for SAFENET notification. These individuals determine the course of action for the submission, forwarding to the regional, state or local level for response.

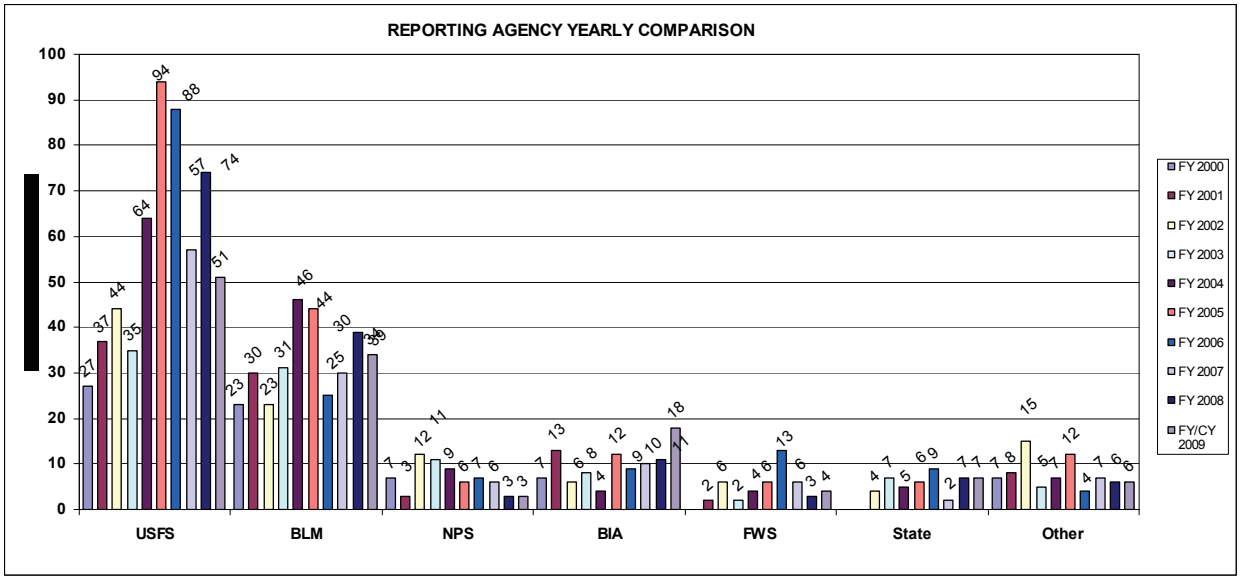
The jurisdictional agency is responsible for researching the issue identified in the submission, taking appropriate action, and filing a corrective action outlining the agency's response (as warranted). Below is a graph showing the number of SAFENETs filed for each jurisdictional agency. The graph identifies 2009 submissions as well as cumulative trend since the establishment of SAFENET.



Based on the amount of land encompassed by the US Forest Service (USFS), it is not a surprise that they received 37% of the submissions. The Bureau of Land Management (BLM) received 24%, the Bureau of Indian Affairs (BIA) received 14%, the States 11%, other (which includes FEMA, local fire departments and counties) received 9%, the US Fish & Wildlife Service (FWS) received 3% and the National Park Service (NPS) received 2%. The jurisdiction was reported as "unknown" in one SAFENET submittal.

The BLM, FWS, States and Other all showed increases in the number of submissions from the previous year while the USFS, BIA and NPS saw their submissions decrease for 2009.

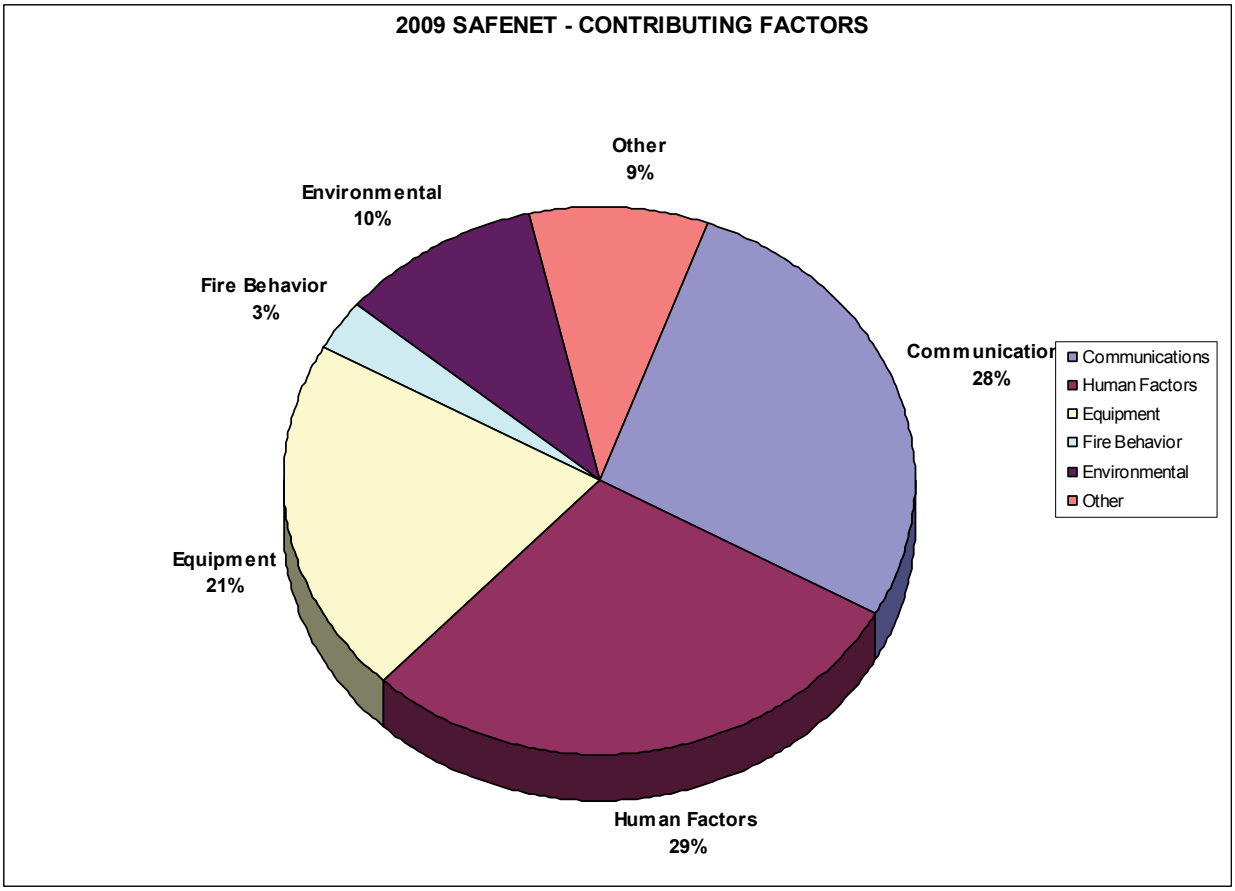
In comparison, the following graph identifies the number of SAFENETs received based on the agency of the submitter.



USFS and BLM employees continue to file the highest number of SAFENETs. The rest of the submissions are distributed amongst the other agencies and states, along with county and local fire departments which make up the "Other" category.

Contributing Factors - 2009

One of the key elements analyzed by managers is contributing factors. Managers want to know what caused or lead to a health/safety concern in the field. The SAFENET system allows the submitter to choose from six different elements that may be present, including communications, human factors, equipment, fire behavior, environmental, and other. Many submissions cite more than one contributing factor. The following chart identifies the contributing factors involved in the submissions for 2009 by percentage.



Human Factors – 29%

In 2009 human factors was the leading contributing factor in SAFENET submissions, edging out communications by one percent. This category consists of several elements including Decision Making, Leadership, Situational Awareness, Risk Assessment, Performance, and Fatigue. Many of these elements are overlapping in nature and are subjective based on the opinion of the SAFENET submitter. However, below are a few examples of submissions received that exhibit each of these elements.

Decision Making –

- Three land owners put in a disk line on state land in front of the head of my fire.
- Improper use of drip torch.
- Employee self-dispatched himself to the incident and then engaged in the suppression operation without checking in or making any notification to the IC.
- Taking a fire assignment while injured and not letting anyone know.
- An otherwise excellent, conscientious employee was texting while driving a work vehicle on fire prevention patrol. The driver immediately stopped texting when passenger requested her to do so.
- A crew waiting for transportation positioned themselves adjacent to a heliwell to watch the operation. When a helicopter crashed, the crew was exposed to flying debris but fortunately no one from the crew was injured.

Leadership –

- Crew supervisor with lack of adequate experience.
- Threats made to personnel about reporting unsafe practices.
- Resources permitted to conduct fire suppression operations without qualified personnel to serve in leadership roles (Incident Commanders and Single Resource Bosses).
- AD firefighter completed multiple operational periods before it was discovered that the individual was not red carded (did not attend refresher training or complete arduous WCT).
- Certification of ENOP without following SOP's. Person in question has had less than the agency required 80 hours of drivers training in a Type 3 fire engine that he staffs as well as having a CDL for less than a week.

Situational Awareness –

- Lack of environmental awareness resulting in ATV accident.
- Firefighter was hit by a limb or a small snag during patrol of fireline. Firefighter was patrolling alone without radio communications when he was struck.
- Safety Officer encountered 4 helitack crew members on the fireline who did not attend an operational briefing, did not possess a current IAP or have the assigned operational frequencies programmed in their radios.

Performance –

- Leaving the dispatch center unstaffed with out back up.
- Employee driving government vehicle backed into a privately owned vehicle parked at the fire station. Driver was distracted by the mobile radio and did not use a backing spotter.
- Upon return of a chainsaw kit, a 1 gallon premix fuel can was found in a packsack with the spout still on the can. The packsack was placed sideways in the box resulting in fuel leakage.

Risk Assessment –

- Engine Boss positioned crew at the end of a dead end road fighting the head of this fire with engine being the only source of water (300 gallons).
- The burn boss was not assessing the risk and possible consequences of novice cutter cutting a highly complex tree.
- Supervisor of a work project directed personnel to fell trees with winds in excess of fifteen miles per hour (trees were observed to be rocking several feet back and forth in the wind).
- Personnel not wearing required PPE (helmet) when operating an ATV.
- A type two team showed up to the incident without proper PPE or tents.
- An 8 foot tall candle stick snag (12" in diameter) was burning at its base about 10 feet above where a crew was working. The snag fell over, rolled down a steep embankment and narrowly missed hitting crew members.

Fatigue –

- During training, two firefighters participating in a terrain hike started showing signs of heat exhaustion and dehydration. The EMT on scene treated the firefighters and they were immediately driven to a hospital where they were diagnosed with Rhabdomyolysis (excess protein in the blood caused by muscle damage).
- Crewmember became disoriented, nauseated and lethargic while participating in an organized 4 mile PT run during the morning hours.

Communications – 28%

In 2009, communications were the second leading contributing factor in SAFENET submissions. It was the leading factor for eight of the last ten years. The majority of submissions in this category deal with communications equipment along with several submissions that refer to interpersonal communication issues. Some examples are listed below.

Communications Equipment –

- Conducting a prescribed burn with poor to non-existent radio communications.
- This interagency communications center does not have the ability to monitor or transmit on National Flight Following and does all of the Flight Following on either AIRGUARD or Forest Net.
- Repeated delays in getting Ranger District radio repeaters repaired.
- Agency cell phones disconnected for non-payment.
- There is a lack of adequate communication and incident support systems. There is no radio repeater system and communications are limited to line of sight or cell phones. There is also no established initial attack dispatch center.
- A microwave system went out of service, terminating radio communications between the field and the dispatch center during a rapidly escalating wildland fire incident.
- Chronic problems with radio repeater system. Problems range from a complete loss of repeaters for days at a time to intermittent failures and degraded transmit and receive quality.
- We are having serious radio problems. There is a constant flow of radio traffic in Spanish that appears to originate from Mexico. The traffic often covers large portions of radio transmissions. This makes the use of our radio system at least 50 percent less effective.
- The phone system has continued to fail ever since we got a Cisco VOIP phone system. We have submitted numerous tickets over the past few years about calls being dropped and getting an immediate busy signal when trying to call outside the dispatch center.
- Computer servers at a dispatch center went down as they were trying to complete a Spot Weather forecast for a wildland fire.
- Extended delays (2 weeks +) in obtaining help desk assistance to repair computers and radio at a helibase.
- Two repeaters share the same transmit and receive frequencies and radio traffic on one of these repeaters regularly "walks" on the transmissions from the other.

Interpersonal Communications –

- Critical safety information was not communicated to the dispatch office prior to a prescribed burn.
- IHC Crew notified Helibase of new helispot location and provided latitude & longitude for delivery of food, water and two-week bags to be slung into this new spot. Helicopter personnel were sent into different location than coordinates given. When IHC returned to new helispot, no supplies and equipment were there.
- A Strike Team Leader was using radio communications frequencies which are not assigned to the incident. The radio frequencies were not to be used outside of the county that the Strike Team Leader is from.

Equipment – 21%

The majority of SAFENET submissions identifying equipment as a contributing factor pertain to radio/communications issues. Examples of these are listed in "Communications" category above. Examples of other equipment submissions include the following.

- Late model diesel engines experienced a "regeneration cycle" during an inopportune time (multiple submissions).
- A 2007 Polaris Ranger UTV caught fire when the rubber anti-vibration bushing for the exhaust mount ignited from radiant heat off the exhaust pipe.
- Four new DOT approved red drip torches from Cascade fire Equipment were purchased. After one day of use, two of the four torches purchased began leaking from the vent valve and caught the top of the torch on fire.
- Firefighters discovered two Bendix King rechargeable radio batteries that had melted together and were in the process of combusting. The two batteries were touching end to end on the positive sides. The batteries were removed from the truck compartment which was full of smoke.
- During mop-up operations a 2008 Model 71 International Type 3 engine encountered throttle problems. The PTO would engage, but the throttle would not increase. This occurred during both drafting and pumping operations.
- Throttle position sensor on a 2007 International Model 72 4X4 fire engine went out during mop-up operations rendering it unmovable. An upside down triangle light appeared on the instrument panel and at first it was thought to be associated with re-generation. Upon further diagnosis by talking to International and the home unit mechanic, it was determined that this problem was due to a defective throttle position sensor.
- While driving off the fire line to camp, a brand new Type 6 Engine (International) broke down. The engine fan hit the radiator housing (safety shield), which broke the fan, the radiator, and power steering hoses. The issue with the fan hitting the radiator housing was found on another engine the next day.
- Discovered some new generation shelters that had poly bag damage that we decided to use for training. We then found that 3 of the 7 shelters were becoming un-laminated and were torn/ripped at seams.
- Manufacture defects in two 134 gallon blivet straps.
- Multiple reports of Stihl 441 chainsaws not working in hot/fireline conditions.

- The threaded connections on the fuel line of a Panama Flame Gun loosened through use. As the gun is designed to be pressurized and slung over the shoulder during use, if loose fittings are undetected it is likely the operator will be saturated with drip mix resulting in skin rashes, and significantly increased combustibility.

Environmental – 10%
Listed below are examples of SAFENETs that identified environmental conditions as a contributing factor.

- We were told by the military that the burn unit had been "swept" for UXO and had been cleaned up prior to the burn. While I was burning out around a grassy mound with a target on top, I looked back at my smoke and noticed a section of it was putting out dense green smoke.
- UXO found in burn unit.
- Despite PPE and defensive measures taken with protective lotion, a firefighter contracted a severe case of poison oak while removing hazardous fuels.

Fire Behavior –3%
A small number of SAFENETS identified fire behavior as a contributing factor. Identified below are examples.

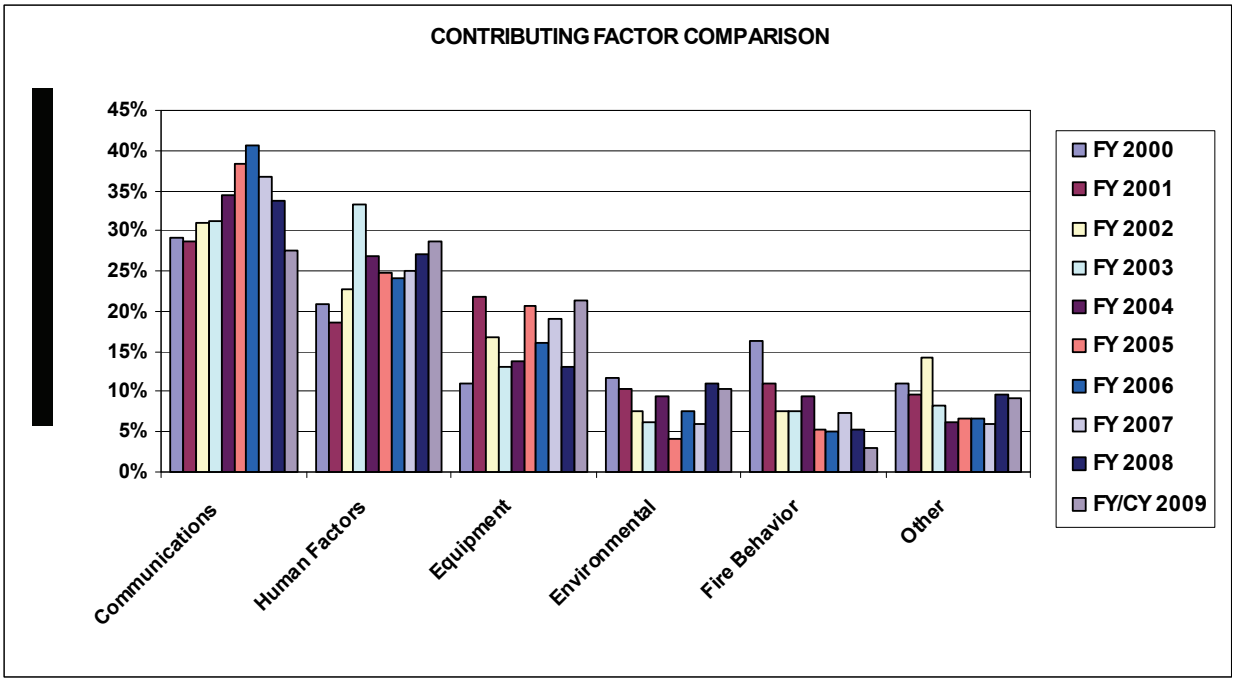
- Winds from an unobserved thunder cell resulted in a large blowup and a near entrapment.
- During the initial attack of a fire, a type 4 engine was overrun by fire. A red flag warning was in effect for the day due to a passing cold front producing low RH values and high winds.

Other – 9%

- A crew member noticed a sore on his leg and thought he had been poked by a thorn bush. After transport to a local hospital he was diagnosed with Community Acquired MRSA and treated accordingly. Upon further assessment it was found that the crew had 3 members that had been diagnosed with Community Acquired MRSA over the last 3 weeks.

Contributing Factor Trends

The SAFENET program has been operational for ten years and aids in determining trends from the field regarding health and safety issues. This allows managers to focus on areas that continually raise concern. Below is a chart that compares Contributing Factors over the past ten seasons.



Statistically speaking, communications (both equipment concerns and personal communication issues) is the most common contributing factor to health and safety concerns that are filed through the SAFENET system. It was the leading contributing factor for eight of the last ten years. However, human factors have been the second leading contributing factor for eight years and the leading cause for two years. Both factors require additional discussion.

Since communications is a critical element of a fundamental wildland fire safety protocol – Lookouts, Communications, Escape Routes and Safety Zones (LCES), it is a major concern when there is a breakdown in communications. In 2009 numerous SAFENETs identified radio, telephone and computer systems that were not operational and in many cases, the necessary repairs did not occur for extended periods. A focused effort improving each agency's communications maintenance and repair procedures could reduce the downtime of essential communications systems.

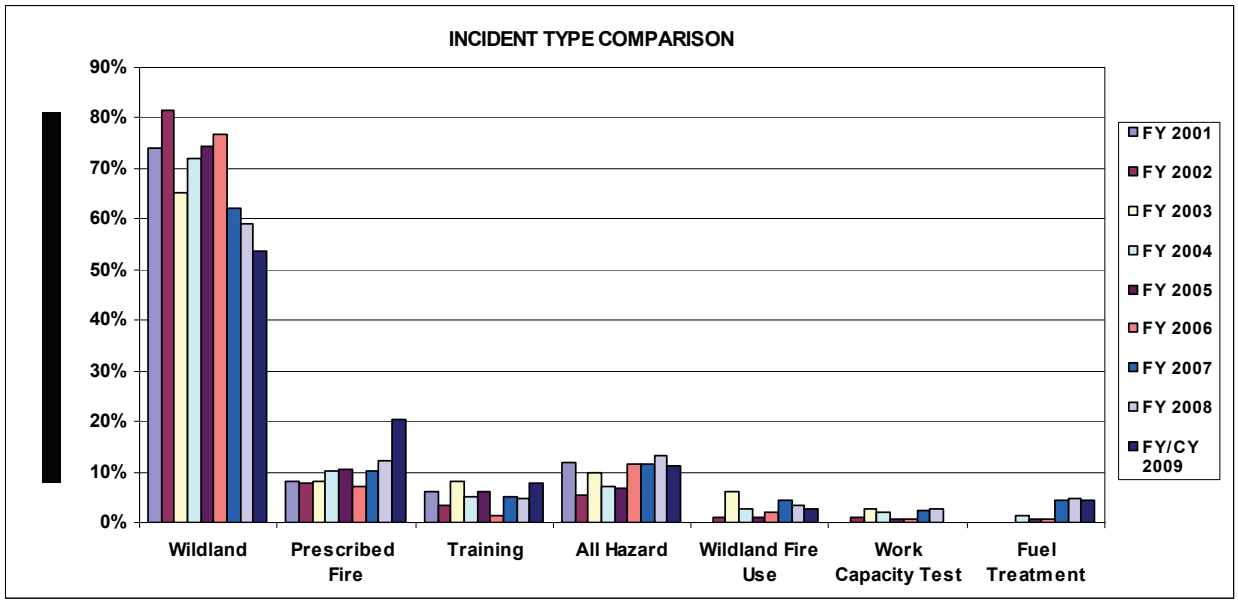
Human Factors is consistently the second most common contributing factor of SAFENETs filed. The frequency of human factors being identified as a contributing factor has also been on the increase for the past three years. This is a difficult factor to address as it deals with the human element including differing perceptions, opinions, and communication styles. However it does underscore the importance of training courses and other programs that emphasize the role of human factors in wildland fire management. A continued focus on operational leadership, situational awareness and risk management/risk assessment appear to be warranted.

There was a noticeable increase in equipment being identified as a contributing factor in 2009. A number of the 2009 equipment related SAFENETS addressed concerns with new diesel powered engines. The record also shows previous spikes in equipment related SAFENETS in 2001 and 2005.

It is also interesting to note that there has been a steady decline in fire behavior being identified as a contributing factor since the SAFENET program became operational in 2000.

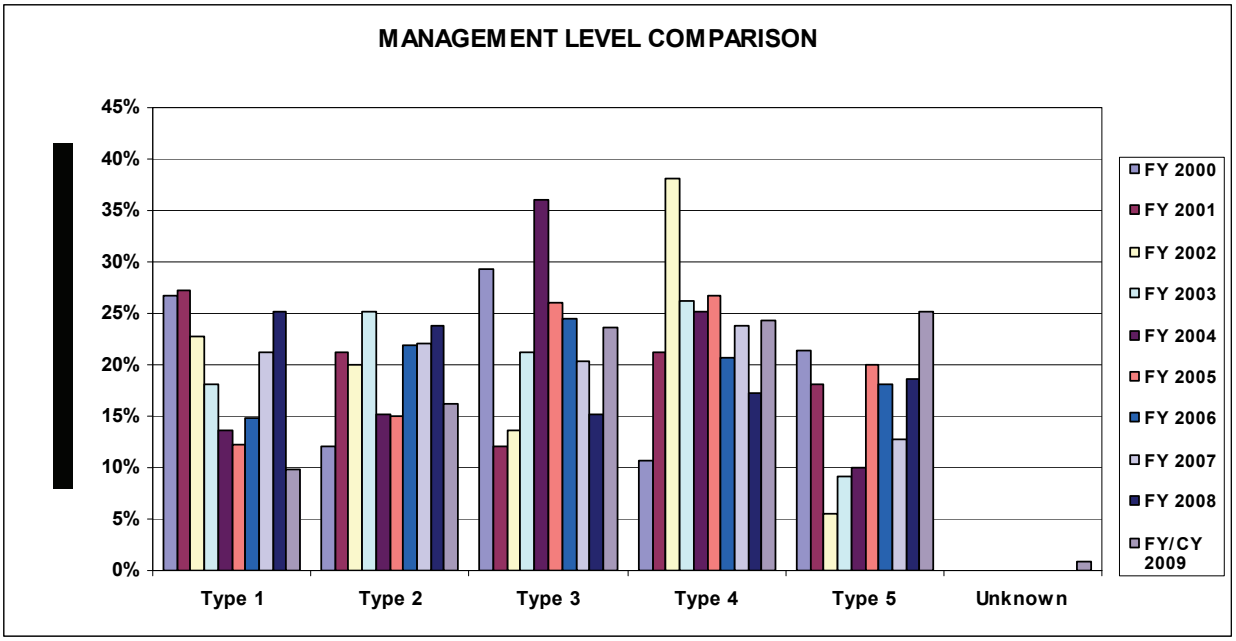
Other Trends

Another trend that can be ascertained pertains to the type of incident in which the majority of health and safety concerns occur. The following graph identifies the incident types for which SAFENETS were filed.



Not surprisingly, wildland fire gathers the majority of submissions as this is where the majority of firefighters spend their time and is also the environment that is the most unpredictable and uncontrollable. However, it is important to note that the number of SAFENETs submitted for prescribed fire has been on the rise for the last three years and accounted for one-fifth of the total SAFENETs submitted in 2009. This is a trend that warrants additional emphasis.

SAFENET submissions also identify the management level (Type 1 through Type 5) of wildland fire incidents. The graph below displays the management level identified for the last ten years.

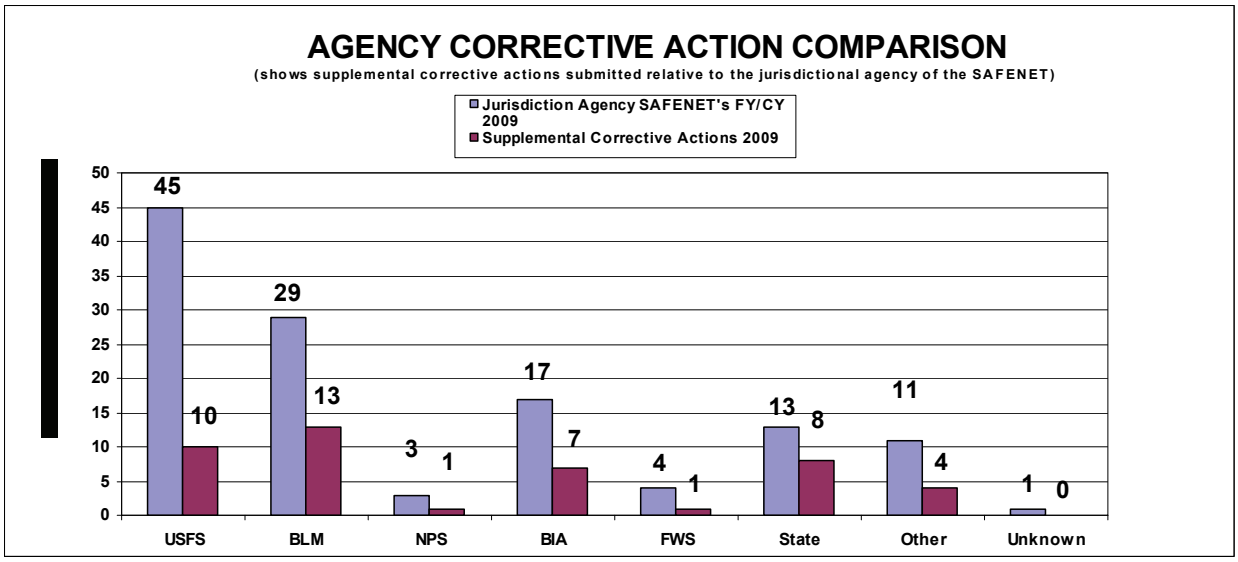


In 2009 Type 5 incidents accounted for the greatest number of SAFENETs submitted at 25%, followed closely by Type 4 and Type 3 incidents at 24% each. SAFENETS filed for Type 2 and Type 1 incidents sharply declined in 2009; possibly due to the relatively small number of large fire incidents in much of the United States. There appears to be a trend of increasing SAFENET submittals for Type 5 incidents since 2007.

Corrective Actions

As stated earlier, SAFENETs are forwarded to the jurisdictional agency listed in the submission and it is their responsibility to research the health/safety concern and provide a Supplemental Corrective Action at the appropriate level of the organization (as warranted). Supplemental Corrective Actions are follow-ups to those SAFENETS that can not be fully addressed in the field when they occur and require higher level action and coordination so they can be prevented in the future.

Included below is a chart that identifies the number of SAFENETs received by the agency of jurisdiction along with the number of Supplemental Corrective Actions taken by that agency.



As the graph indicates the agencies provided Supplemental Corrective Actions as follows: USFS – 22%, BLM – 45%, NPS – 33, BIA – 41%, FWS – 25%, State – 62%, and Other – 36%.

Unpublished SAFENETS

Each year some SAFENETs that are submitted are not posted to the public website because they do not meet the established criteria for SAFENET submittals. The posting criteria are listed below and additional information is available on the SAFENET website (http://safenet.nifc.gov/) under SAFENET Protocols.

Posting Criteria

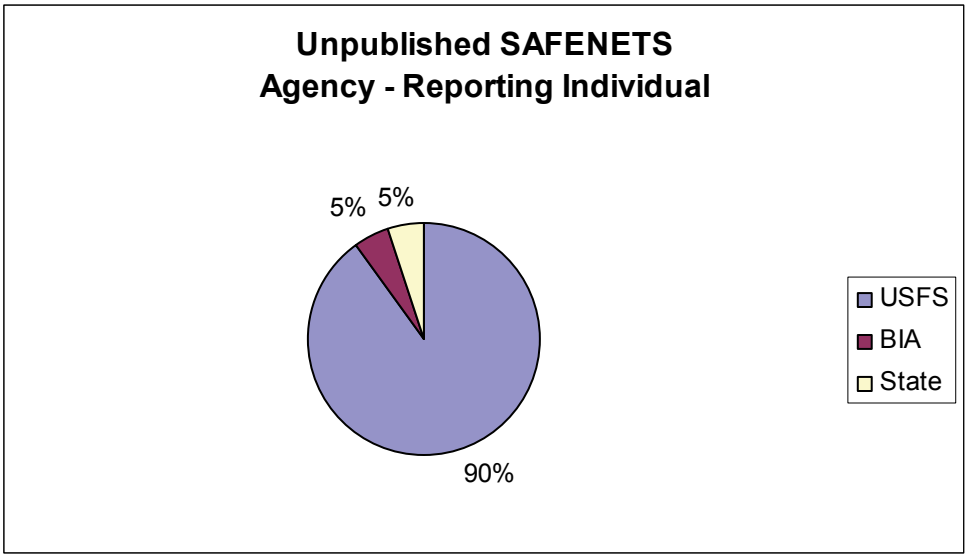
SAFENETs will be screened for safety and health related event(s). If submittals doe not meet this standard, they will not be published or included in the SAFENET database. Other posting considerations are:

- Individual(s) submitting SAFENETs should do so based on firsthand observation or participation in the identified event(s). SAFENETs submitted that are based solely on hearsay or other secondhand information will not be posted.
- SAFENETs that contain unprofessional content (e.g. personal attacks/slander, character defamation) will not be posted, or the offensive comments will be removed and only the safety and health related content will be displayed when posting.
- SAFENETs that do not include name of incident and/or location of event will not be posted.
- SAFENETs related to incidents that have on-going serious accident investigations will not be posted until the formal investigation process is completed. These SAFENETs will be sent directly to the serious accident investigation team.

Questionable submittals will be referred to Federal Fire and Aviation Safety Team (FFAST) members, where a majority vote will be required to hold posting of a SAFENET from the system (a majority is 3 of 5 team members). Submitters who provided their names will receive a response as to why the SAFENET will not be posted.

2009 Unpublished SAFENETs

Excluding several "test" SAFENETs sent by SAFENET Administrators, a total of 21 SAFENETs were not published in 2009. These represent 17% of the total SAFENETs that were submitted. Identified below is a breakout of these by the agency of the reporting individual.



Summary

SAFENET is the only interagency mechanism for firefighters on the ground to report "near miss"/"close call" occurrences. It provides the opportunity to detect "weak signals". This is essential to safety management programs so that corrective actions and other hazard mitigation measures can be taken before more serious incidents occur. The data is important to identify trends that are utilized by the Risk Management Committee to establish safety prevention programs and emphasis areas.

The SAFENET system continues to provide a valuable link between upper level management and the firefighters in the field. Wildland firefighter are strongly encouraged to continue submitting SAFENETs on safety and health issues that they encounter.

Appendix A

For reference purposes, a list of incidents on which SAFENETs were filed for the 2009 season is provided below. *Note:* The incident name was not included in all the SAFENETs that were submitted.

Wildland Fires

Augustine Fire (2)	Iron Complex (1 in 2009, 6 in 2008)
Backbone	Jessuite Fire
Banning Fire	Lone tree
Bear Canyon (2)	Lookout
Big Meadows	LPF Cover
Big Pole Fire	MM 125 Assist
Big River	Mountainairre
Big Sheep	Observatory Fire
Bonita	Old Highway (2)
Canal Creek	Pinyon Fire
Clay Hills	Power Station
Cotterel Fire	Railbelt Complex (2)
Crazy Mountain Complex	Redrock
Currant Fire	Roans Cliffs Fire
Dairy	S. F. Dearborn River Fire
Diamond Fire	Settlement
Diesel Regeneration on Type 6 Engine	Shoot Fire
Drew Fire	Shorty Fire
Driving from Fire	Shoshone Basin
Forest Level Initial Attack	Station Fire (2)
Forestwide IA Resources	Tavaputs
Fort Carson Range Fire	Tea Incident, Montecito
Four mile	Tejauna
Gap Creek Fire	Timber Ridge # 1
Guiberson	Ukonom Complex (1 in 2009, 2 in 2008)
Hard Luck Creek	White Valley
Harden Lake	Young Fire
Hensley	Zitziana
Highway 91	# 127
Initial Attack (2)	# 1151

Prescribed Fires

Asis Rx	Moose Creek 2
Bald Eagle Burn	Nancy
Berita Canyon	Pile Burning
Bowlegs Low Complexity Pile Burn	Sawmill Road Rx (2)
Buffalo Trail Rx Fire	Schafer / Hoffman Rx
Fort Richardson Rx	Small Arms Range Prescribed Fire
Inchelium Pile Burn	Squad
Mark James Jones Rx Burn	Thomas Creek Pile Burn
Martinez Rx	Waterways Rx Fire
Moose Creek 1	7130 Rx Burn

Fuel Treatment

ATV Rollover	Project Work
Hazardous Fuels Reduction Project Work	Red Cedar Thinning

All Hazard, Training, & Other Incidents

AOICC Support	Mescalero Severity
Big Springs	Miscellaneous Preparedness
Disconnected Cell Phone	Multi Channel Base Radio
Dispatch	OMA Support
Dispatch Operations	Physical Training
Driving	Radio Problems
Drowning (public)	Radio Repeater
EFF HECM Training	Star Peak/ Lovelock Radios
Fire Prevention Patrol	Training
HEBO Radio Problems	Training in Yard
McWilliams	UPF Radio System
Medical Assist in DPA	Various – Throughout Alaska
2008 Fire Season	