

Just How

Flammable

Are Tents?

By Russ Miller

Some Marines who were smoking started a tent fire that caused \$1.5 million in damage to military property and injured 26 personnel. Originating in a part of Camp Commando, Kuwait, the May 24 fire destroyed 22 tents before jumping over a large sand berm into another tent city, where 22 more tents were destroyed.

It was a typical day in Kuwait. Several Marines were mingling, having a smoke just outside a tent. No one knows who caused the problem or why, because the Marines left the scene once the tent went up in flames. The evidence makes it easy to determine how a typical smoke break resulted in so much damage. The tent where the fire started had several cigarette butts located within a foot of it. Camp rules required Marines to be outside a safe radius from their tents when smoking to prevent ashes from igniting the flammable tent material. Because a smoke pit wasn't established, though, Marines began lighting up closer to their tents. The wind-driven sand and a desire to lean against something gradually moved the Marines closer to the tents to enjoy their cigarettes.

The flammability of Middle Eastern tents cannot be stressed enough; a flammable substance is used to waterproof the canvas. Adjacent tents thus quickly can

become involved through the transfer of radiant heat and through the spread of flying embers. A fire extinguisher alone is not enough to overcome the fire once a tent is blazing.

In this incident, the tents were placed within 10 feet of one another and easily caught fire. The initial fire's radiant heat raised the temperature surrounding the tent, causing the neighboring tents to reach their flash point and ignite.

Radiant heat is one of three methods heat is transferred; convection and conduction are the other two. To counter the effects of radiant heat, where water sources are available, water must be sprayed onto adjacent tents, and exposures or a water curtain must be located between the fire and other tents to be effective. Adequate water sources aren't always available in forward-deployed areas.

Test results show that these tents can be consumed totally by fire in less than three minutes; a fire destroyed five tents at another location in less than 3 minutes. One tent took only 49 seconds to be incinerated.

This was a planned burn to test the volatility of the tents and the effects of radiant heat.





These five tents were destroyed in two minutes 48 seconds.

Marines collapse tents in an attempt to prevent the fire from spreading.



It took less than three minutes for this tent to burn to the ground.



The other problem in this case was the wind speed of 8 to 12 knots, with gusts of 20 to 22 knots. Wind easily can carry burning embers into the sky and over sand berms. Once the initial fire was engulfing tents, the wind carried embers over to the other area, setting the second part of the camp ablaze.

The total DoD loss was \$1,405,808.39, including \$477,053.03 in military equipment and \$928,755.96 in destroyed camp infrastructure. The dollar loss of personal equipment of 458 Marines and Sailors was difficult to determine. However, it is easy to imagine the drop in morale for these Marines and Sailors.



Tents on fire at Camp Commando, Kuwait, May 24, 2003. As heat from the burning tents increases, more tents are ignited.

Having little to their name while in Iraq, they were left with barely more than what was on their backs for quite sometime. A total of 26 injuries were reported: 23 cases of smoke inhalation, two minor eye injuries, and one minor head injury.

The investigation identified improper disposal of smoking materials as the root cause. No published fire-safety plan was identified, either. Compounds now have adopted the practice of taking down tents if a fire begins which makes them a smaller target for the dangerous, flying embers.

The importance of creating dedicated smoke pits when establishing new areas must be emphasized. Most compounds now have permanent smoke pits that are well away from the tents. Ensure these smoke pits are not placed near other flammable objects like trash dumpsters. Reinforcing the flammability of tents also cannot be stressed enough when getting established at a compound.

Here are some recommendations to help prevent future fires:

1. Educate Marines and Sailors on the flammability of Middle Eastern tents.

2. Review/revise the fire-safety plan to include setting up designated smoking areas and possibly moving existing smoking areas farther back.

3. Publish fire-safety plans and ensure everyone living in the compound understands the policies and procedures. **GW**

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A total of 42 tents were lost in this fire. There were 26 injuries reported: 23 cases of smoke inhalation, two minor eye injuries, and one minor head injury. Damage was estimated at 1.5 million dollars.