



THIS DAY IN NAVAL SAFETY HISTORY

JULY 29, 1967

USS FORRESTAL (CVA 59) FIRE

134 KILLED, 161 INJURED, 21 AIRCRAFT DESTROYED, 40 AIRCRAFT DAMAGED
ESTIMATED OVER \$130 MILLION IN DAMAGES

EVENT: At about 10:53 a.m. July 29, 1967, a fire and explosion occurred aboard USS Forrestal (CVA 59) when a Mark 32 five-inch Zuni rocket accidentally fired from a LAU-10 rocket pod due to an electrical power surge during the switch from external to internal power. By the time the fire was extinguished, 134 crewmembers were killed, 161 were injured, 21 aircraft were destroyed, and 40 aircraft were damaged. The ship was operating on Yankee Station off Vietnam. This mishap was, and remains, the second worst loss of life on a U.S. Navy ship since World War II.

Forrestal arrived at Yankee Station July 25, 1967, and launched her first strikes at 6 a.m. that day. The skipper of the Norfolk-based carrier, Capt. John K. Beling, and his crew were determined to show the Pacific Fleet what they could do. The Forrestal rearmed that evening from the ammunition ship Diamond Head (AE 19). Over the next four days, the carrier's aircraft flew more than 150 sorties over North Vietnam without losing a plane.

At 10:50 a.m. July 29, Forrestal was steaming through the South China Sea preparing to send her second strike of the day toward North Vietnam. More than 20 aircraft crowded the ship's aft flight deck with barely walking room between them. Nearly 20 more were jostling for position on the remainder of the four-acre deck.



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With the aircraft fully fueled and armed, their engines were being spooled up, and pilots along with plane and deck crews were making last-minute checks for an 11 a.m. launch. One minute later, the 5,400 Sailors and airmen of the Forrestal began a fight for their lives and that of their ship.

An errant electrical charge had ignited the motor of a 5-inch Zuni rocket mounted on an F-4B Phantom II fighter piloted by Lt. Cmdr. Jim Bangert of Fighter Squadron (VF) 11. The rocket whooshed 100 feet across the deck, severing the arm of a crewman in its path, before striking and rupturing the external fuel tank of an A-4E Skyhawk attack bomber piloted by Lt. Cmdr. Fred White of Attack Squadron (VA) 46, who was killed instantly. The two fire crews first on the scene were also decimated. Nine seconds later, a second bomb exploded. Bodies and debris were hurled nearly a thousand feet forward to the bow of the ship.

Within the first five minutes of the disaster, the aft end of the 1,039-foot ship was rocked by seven more major explosions of 1,000-pound bombs. Minor explosions were too numerous to count. The fires were fed by 40,000 gallons of highly volatile jet fuel spilling from tanks and fuel cells ripped by blasts and shrapnel.

The explosions smashed holes in the nearly 2-inch-thick armor flight deck. Flaming and unburned fuel, water, and fire-retardant foam cascaded into the compartments below — primarily the crew berthing areas.



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Fighting the fires below-decks, given the confined spaces, lack of light, thick black smoke, and concentrated toxic fumes were even more dangerous than battling the flight-deck blaze. While the fire on the flight deck was contained within an hour, those below raged until 4 a.m. the next day.

The Forrestal disaster was the second (and worst) of three serious U.S. Navy carrier fires in the 1960s. In the first, USS Oriskany (CVA 34) suffered a fire Oct. 26, 1966, on Yankee Station that killed 44 and injured 138 when a magnesium parachute flare was accidentally ignited (human error), and a panicked Sailor threw it back into the magnesium storage locker instead of throwing it overboard. Many of the dead were pilots killed in their sleep by toxic smoke inhalation. The third disaster occurred on Enterprise (CVA[N] 65) Jan. 14, 1969, while she was en route to Vietnam. The disaster killed 28, injured 314 and destroyed 15 aircraft when hot exhaust from an improperly placed aircraft starter ignited another Zuni rocket, starting a series of explosions. In the case of Enterprise, lessons learned from Forrestal (and not having old and unstable ordnance on board) resulted in the fire being contained more rapidly with fewer casualties.

The damages from the Forrestal disaster exceeded \$130 million: Repairing the carrier cost \$72 million; destroyed aircraft accounted for \$44.5 million; with another \$10 million to repair damaged aircraft, nearly \$2 million in ordnance and over \$3 million in destroyed equipment.

LESSONS LEARNED/PREVENTIVE ACTIONS: The most significant causal factor was a power surge in an F-4 Phantom, triggering the launch of a Zuni rocket while the Phantom was parked on the flight deck.

Underlying issues included: 1) Zuni rocket launcher design flaws, 2) Combat time pressures resulting in waivers and on-the-fly procedural changes, 3) Miscommunication of and lack of command line involvement in procedural changes, 4) Dangerously unstable ordnance, and 5) Insufficient firefighting training and infrastructure.

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**Major lessons that continue to apply to today's Sailors:
Today's Naval systems are designed with a rigorous hierarchy of controls in place to mitigate risks. From physically removing the hazards via elimination controls, through engineering controls to isolate the hazards and procedures to guide how Sailors perform work. As shown in the Forrestal fire, that robust system of controls can be defeated by individual Sailor's procedural non-compliance.**



REFERENCES:

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