

เขียนโดย Administrator

วันเสาร์ที่ 30 มกราคม 2016 เวลา 02:07 น. - แก้ไขล่าสุด วันเสาร์ที่ 30 มกราคม 2016 เวลา 02:37 น.

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The Challenger lifts off on Jan. 28, 1986, from a launchpad at Kennedy Space Center, 73 seconds before an explosion killed its crew of seven.

The Space Shuttle Challenger disaster occurred on January 28, 1986, when the NASA Space Shuttle orbiter Challenger (OV-099) (mission STS-51-L) broke apart 73 seconds into its flight, leading to the deaths of its seven crew members, which included five NASA astronauts and two Payload Specialists. The spacecraft disintegrated over the Atlantic Ocean, off the coast of Cape Canaveral, Florida, at 11:39 EST (16:39 UTC). Disintegration of the vehicle began after an O-ring seal in its right solid rocket booster (SRB) failed at liftoff. The O-ring failure caused a breach in the SRB joint it sealed, allowing pressurized burning gas from within the solid rocket motor to reach the outside and impinge upon the adjacent SRB aft field joint attachment hardware and external fuel tank. This led to the separation of the right-hand SRB's aft field joint attachment and the structural failure of the external tank. Aerodynamic forces broke up the orbiter.

The crew compartment and many other vehicle fragments were eventually recovered from the ocean floor after a lengthy search and recovery operation. The exact timing of the death of the crew is unknown; several crew members are known to have survived the initial breakup of the spacecraft. The shuttle had no escape system, and the impact of the crew compartment with the ocean surface was too violent to be survivable.

The disaster resulted in a 32-month hiatus in the shuttle program

and the formation of the Rogers Commission, a special commission appointed by United States President Ronald Reagan to investigate the accident. The Rogers Commission found NASA's organizational culture and decision-making processes had been key contributing factors to the accident. NASA managers had known since 1977 that contractor Morton Thiokol's design of the SRBs contained a potentially catastrophic flaw in the O-rings, but they had failed to address this problem properly. They also disregarded warnings (an example of "go fever") from engineers about the dangers of launching posed by the low temperatures of that morning, and failed to adequately report these technical concerns to their superiors. Wh at the Rogers Commission report did not highlight was that the vehicle was never certified to operate in temperatures that low. The O-rings, as well as many other critical components, had no test data to support any expectation of a successful launch in such conditions. Bob Ebeling from Thiokol commented: "[W]e're only qualified to 40 degrees ...'what business does anyone even have thinking about 18 degrees, we're in no man's land.'" Ken Iliff, a former NASA Chief Scientist who had worked the Space Shuttle Program since its first mission (and the X-15 program before that) stated in an official 2004 NASA publication,

"Violating a couple of mission rules was the primary cause of the Challenger accident."

As a result of the disaster, the Air Force decided to cancel its plans to use the Shuttle for classified military satellite launches from Vandenberg Air Force Base in California, deciding to use the Titan IV instead.

Approximately 17 percent of Americans witnessed the launch live because of the presence of Payload Specialist Christa McAuliffe, who would have been the first teacher in space. Media coverage of the accident was extensive: one study reported that 85 percent of Americans surveyed had heard the news within an hour of the accident. The Challenger disaster has been used as a case study in many discussions of engineering safety and workplace ethics.



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## Christa McAuliffe - America's first teacher in space

# 30 Years After Explosion, Challenger Engineer Still Blames Himself

Thirty years ago, as the nation mourned the loss of seven astronauts on the space shuttle Challenger, Bob Ebeling was

steeped in his own deep grief.

The night before the launch, Ebeling and four other engineers at NASA contractor Morton Thiokol had tried to stop the launch. Their managers and NASA overruled them.



That night, he told his wife, Darlene, "It's going to blow up."

When Challenger exploded 73 seconds after liftoff, Ebeling and his colleagues sat stunned in a conference room at Thiokol's headquarters outside Brigham City, Utah. They watched the spacecraft

explode on a giant television screen  
and they knew exactly what had  
happened.

Three weeks later, Ebeling and another engineer separately and anonymously detailed to NPR the first account of that contentious pre-launch meeting. Both were despondent and in tears as they described hours of data review and arguments. The data showed that the rubber seals on the shuttle's booster rockets wouldn't seal properly in cold temperatures and this would be the coldest launch ever.

Ebeling, now 89, decided to let NPR identify him this time, on the 30th anniversary of the Challenger explosion.

"I was one of the few that was really close to the situation," Ebeling recalls. "Had they listened to me and wait[ed] for a weather change, it might have been a completely different outcome."

We spoke in the same house,  
kitchen and living room that we

spoke in 30 years ago, when Ebeling didn't want his name used or his voice recorded. He was afraid he would lose his job.

"I think the truth has to come out," he says about the decision to speak



privately then.

"NASA ruled the launch," he explains.

"They had their mind set on going up and proving to the world they were right and they knew what they

were doing. But they didn't."

A presidential commission found flaws in the space agency's decision-making process. But it's still not clear why NASA was so

anxious to launch without delay.

The space shuttle program had an ambitious launch schedule that year and NASA wanted to show it could launch regularly

and reliably. President Ronald Reagan was also set to deliver the State of the Union address that evening and reportedly planned to tout the Challenger launch.

Whatever the reason, Ebeling says it didn't justify the risk.

"There was more than enough [NASA officials and Thiokol managers] there to say, 'Hey, let's give it another day or two,' "

Ebeling recalls. "But no one did."

Ebeling retired soon after Challenger. He suffered deep depression and has never been able to lift the burden of



guilt. In 1986, as he watched that haunting image again on a television screen, he said, "I could have done more. I should have done more."

He says the same thing today, sitting in a big easy chair in the same living room, his eyes watery and his face grave. The data he and his fellow engineers presented, and their persistent and sometimes angry arguments, weren't

enough to sway Thiokol  
managers and NASA officials.  
Ebeling concludes he was  
inadequate. He didn't argue  
the data well enough.

A religious man, this is something he has prayed about for the past 30 years.

"I think that was one of the

mistakes that God made,"

Ebeling says softly.

"He shouldn't have picked me for the job. But next time I talk to him, I'm gonna ask him, 'Why me. You picked a loser.' "

I reminded him of something his late colleague and friend Roger Boisjoly once told me. Boisjoly was the other Thiokol engineer who spoke anonymously with NPR 30 years ago.



He came to believe that he and Ebeling and their colleagues did all they could.

"We were talking to the right people," Boisjoly told me.

"We were talking to the people who had the power to stop that launch."

"Maybe," Ebeling says  
with a weak wave as I  
leave. "Maybe  
Roger's right."

Source -

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