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In this NASA image, we see the Challenger exploding on January 28, 1986. All seven members of the crew died. NASA's Technical Report describes this image: "At about 76 seconds, fragments of the Orbiter can be seen tumbling against a background of fire, smoke and vaporized propellants from the External Tank. The left Solid Rocket Booster (SRB) flies rampant, still thrusting." Click on the image for a better view.

People at Morton Thiokol were also watching the launch on television, in their Utah offices. Roger Boisjoly describes the scene:

It was approximately five minutes prior to the launch as I was walking past the room used to view launches when Bob...encouraged me to enter and watch the launch. The room was filled, so I seated myself on the floor closest to the screen and leaned against Bob's legs as he was seated in a chair. The boosters ignited, and as the vehicle cleared the tower Bob whispered to me that we had just dodged a bullet. At approximately T+60 seconds Bob told me that he had just completed a prayer of thanks to the Lord for a successful launch.

Of course, as the official report describes, at T+59.262 seconds, a flickering flame lapping along the right Solid Rocket Booster had already grown into a "continuous, well-defined plume."

Boisjoly continues:

Just 13 seconds later we both saw the horror of destruction as the vehicle exploded. We all sat in stunned silence for a short time, then I got up and left the room and went directly to my office, where I remained the rest of the day. Two of my seal task-team colleagues inquired at my office to see if I was okay, but I was unable to speak to them and hold back my emotions so I just nodded yes to them and they left after a short silent stay.

And what of the shuttle itself? The official report describes what happened:

(W)hile traveling at a Mach number of 1.92 at an altitude of 46,000 feet, the Challenger was totally enveloped in the explosive burn. The Challenger's reaction control system ruptured and a hypergolic burn of its propellants occurred as it exited the oxygen-hydrogen flames.

The reddish brown colors of the hypergolic fuel burn are visible on the edge of the main fireball. The orbiter, under severe dynamic loads, broke into several large sections which emerged from the fireball. Separate sections that can be identified on film include the main engine/tail section with the engines still burning, one wing of the Orbiter, and the forward fuselage trailing a mass of umbilical lines pulled loose from the payload bay.

Within a week of the disaster, people heard the bodies of the crew had been found. In fact, the crew cabin was not retrieved until 40 days after the explosion. The most startling findings are still hard to comprehend.

See Alignments to State and Common Core standards for this story online at:

<http://www.awesomestories.com/asset/AcademicAlignment/THE-HORROR-OF-DESTRUCTION-Challenger-Disaster>

See Learning Tasks for this story online at:

<http://www.awesomestories.com/asset/AcademicActivities/THE-HORROR-OF-DESTRUCTION-Challenger-Disaster>

Challenger Explodes - Failure of Mission STS 51-L

Challenger exploded during its STS 51-L mission (on January 28, 1986). This NASA image depicts the event in the early stages following the initial explosion.

NASA provides us with details, to help us better understand this picture:

At about 76 seconds, fragments of the Orbiter can be seen tumbling against a background of fire, smoke and vaporized propellants from the External Tank. The left Solid Rocket Booster (SRB) flies rampant, still thrusting. The reddish-brown cloud envelops the disintegrating Orbiter. The color is indicative of the nitrogen tetroxide oxidizer propellant in the Orbiter Reaction Control System.



On January 28, 1986 frigid overnight temperatures caused normally pliable rubber O-ring seals and putty that are designed to seal and establish joint integrity between the Solid Rocket Booster (SRB) joint segments, to become hard and non-flexible. At the instant of SRB ignition, tremendous stresses and pressures occur within the SRB casing and especially at the joint attachment points. The failure of the O-rings and putty to "seat" properly at motor ignition, caused hot exhaust gases to blow by the seals and putty. During Challenger's ascent, this hot gas "blow by" ultimately cut a swath completely through the steel booster casing; and like a welder's torch, began cutting into the External Tank (ET).

It is believed that the ET was compromised in several locations starting in the aft at the initial point where SRB joint failure occurred. The ET hydrogen tank is believed to have been breached first, with continuous rapid incremental failure of both the ET and SRB. The chain reaction of events occurring in milliseconds culminated in a massive explosion.

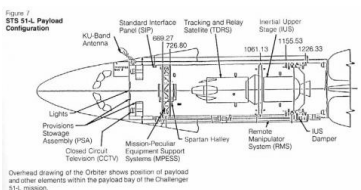
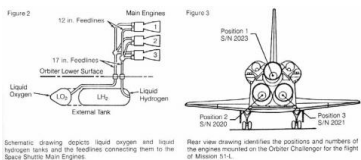
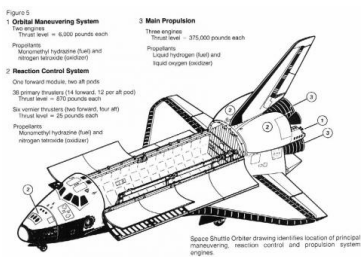
The orbiter Challenger was instantly ejected by the blast and went askew into the supersonic air flow. These aerodynamic forces caused structural shattering and complete destruction of the orbiter. Though it was concluded that the G-forces experienced during orbiter ejection and break-up were survivable, impact with the ocean surface was not. Tragically, all seven crewmembers perished.

Click on the image for a better view.

NASA image included in [NASA Technical Service Reports](#). Public Domain.

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Space Shuttle Orbiter Drawing

Image online, courtesy NASA.

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Space Shuttle Engines - Drawing

Image online, courtesy NASA.

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Payload Bay Configuration

Image online, courtesy NASA.

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