

# Challenger case study

Business



It will go in depth into the cause of the disaster, both technical and ethical, how these problems can be fixed to prevent a recurrence, who the stakeholders are in the project and how they were affected by the disaster. The primary stakeholders include, but are not limited to, the astronauts, their families, the managers, the engineers at both NASA and Morton Thicket, and the government.

These entities are primary stakeholders because they were all directly involved with the mission in some way. The astronauts put their lives on the line; their families were also affected by the loss of a loved one in the disaster.

Also, the managers and engineers at both NASA and Morton Thicket are stakeholders because they were directly involved with the design, communications, and decision making prior to the launch. A lot of credibility was lost from both organizations after the disaster. Lastly, the government is a stakeholder because they invested heavily in the project. There were various technical problems that mounted up to cause the Challenger space shuttle disaster. The central technical problem was with the O-ring seal, which failed at lift-off. Upon failure, pressurized hot gas was able to escape into the SRB attachment hardware and external fuel tank.

Thereafter, the right-hand Solid Rocket Booster's aft attachment and the structural failure of the external tank were separated. Aerodynamic forces were then easily able to break up the orbiter. Lastly, the unavailability of an escape system didn't give the astronauts the option of ejecting from the shuttle after it disintegrated. The managers at NASA knew years earlier about the flaws in

the design of the Garb's O-rings but never paid any attention to the issue. The technical problems could have been solved, and the crash averted if the O-rings had been redesigned as soon as the flaws were noticed.

Also, an escape system should have been incorporated into the shuttle design just in case a mission has to be aborted after lift off. Lastly, it wouldn't have hurt if a third O-ring was implemented. There were various ethical problems in this case which include the NASA managers' failure to address the deficiencies in the Sir's design, NASA managers' non-Callahan attitude about the engineers' concerns, NASA managers' hoarding of information from their superior managers and flaws in the decision making process at NASA. The central ethical problem is the flawed decision making at NASA.

This is the central tentacle problem. Decease ten Lassoer was caused. Day ten calicles made to clear ten shuttle for lift off even when there were technical concerns. This disaster could have been averted if engineers at Thicket had communicated their concerns more effectively to their Managers, who in turn will communicate to the NASA managers on how the design specifications of the O-ring would not be able to accommodate take off at such a low temperature.

Furthermore, information should have been passed on to upper level management at NASA as soon as the lower level managers learnt of the technical concerns, and maybe a decision would have been made to reschedule the lift off.

The managers' disregard for the engineers' concerns shows their disregard for human life. The least they could have done was to notify the astronauts  
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on the technical concerns of the Thicket engineers. Improving communication between NASA managers, engineers, and superiors was the solution to the ethical problems.

Lower level managers should have been willing to listen to the technical concerns of subordinate engineers. Lastly, safety and well-being should have been made a top priority instead of eagerness to launch.

The IEEE code of ethics applies directly to the central ethical problems. The first principle states that one has “ to accept responsibility in making decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment. ” This principle was totally ignored by the managers at NASA.

How can they be concerned about the welfare of the public when they aren't even concerned of the welfare of their own? There was no reason why the space shuttle crew and higher-level management were not be notified of the technical concerns of the Thicket engineers and the potential implications of the space shuttle take off. Also the IEEE code of ethics states that one has “ to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others. ” In this case, the NASA managers moored the technical expertise and concerns contributed by the Thicket engineers.

The managers didn't even see the concerns as being critical enough for upper level management to be aware of them. By application of these principles, the concerns of the engineers would have been accepted, the astronauts and upper level management would have been kept up to speed

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on the development, shuttle lift-off would have been rescheduled, and lives would have been preserved. The central technical problem is related to the ethical problems in this case because these robbers all contributed, one way or the other, to the disaster that occurred.

The central technical problem could have been fixed though, if good engineering ethical standards were followed and the NASA space crew wasn't pressured into a launch of doom. The secondary stakeholders in this case are the general public, other employees of the organizations involved, and the future astronauts.

The public is considered a secondary stakeholder because their taxes are used to fund space shuttle projects just like this one. Other employees at NASA and Morton Thicket who aren't directly involved with the project are also secondary stakeholders because they are affiliated with the organizations involved.

Lastly, school students are secondary stakeholders because they are the future astronauts, managers and decision makers. This mission serves as a learning experience for them. In conclusion, with all the concerns expressed prior to the lift off of the challenger on Tanat Telltale clay, It snouts never nave Eden allowed to ITT or. In ten Torture, netter communication methods need to be implemented between NASA managers at all levels and the engineers they have contractual agreements with.

Prompt and decisive actions should also be taken as soon as deficiencies are noticed in systems designs. Whistle blowing should be encouraged whenever an employee notices unethical methods being utilized by their peers or

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superiors. Also, major ethical decisions should never be made without getting the approval of upper level management. There is no reason why technical concerns relating to an event as important as a space shuttle launch shouldn't be available to upper management. If better decisions had been made, the crew, which includes the schoolteacher, would still be alive today.