

Engineering case study samples

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System Construction

Introduction

The best of engineering marvels are built on the basis of sound theory, fail-safe design and astute engineering skills that transmute the design to physical reality. In the entire sequence from drawing board to reality, if there is an error in any step, the greatest of engineering feats can come undone.

Catastrophic Failure of Space Shuttle Challenger

The Space Shuttle Challenger 51-L was the twenty fifth mission in NASA's space program. Given its past history of successful launches, NASA was confident of a repeat performance. However, on 28 Jan 1986, the Challenger exploded shortly after takeoff, killing all seven crew members (Forrest). The failure of the Challenger was due to a host of strategic and cultural reasons. From the engineering viewpoint, the critical aspect of the failure was failure of the ' O' Rings of the Solid Rocket Booster (SRB). The launch was to happen in January, and the day of the launch was predicted to be relatively cold. The engineers who made the ' O' Ring, Ms Thiokol, were skeptical about the performance of the ' O' rings in cold weather. The feared

that the ' O' Rings would not achieve the design parameters laid down for launch conditions (Forrest).

When the Thiokol engineers flagged the possibility of the ' O' rings not meeting the laid down design parameters for the cold weather launch scheduled on 28 Jan, there were a flurry of meetings between the Thiokol engineers and NASA. NASA was under tremendous political pressure to go ahead with the launch, as future budgets hung in the balance. NASA officials, in turn, pressured the Thiokol management to rethink their misgivings about the ' O' ring, indicating that they ' put on their management hats' instead of their ' engineering hats'. The Thiokol team had its own mini conference and later confirmed to NASA that they could go ahead with the launch (Forrest). During the fateful launch, the ' O' rings failed catastrophically, causing the Challenger mission to fail and leaving an irreparable scar in the American psyche.

Conclusion

The case of the Challenger brings home the point that the best of designs are only as strong as the execution. The failure of a single component in the spaceship amongst millions to adhere to design standards caused a catastrophic failure. This would be the single most important lesson to take home from the engineering point of view.

Work Cited

Forrest, Jeff. " The Space Shuttle Challenger Disaster: A Failure in Decision Support System and Human Factors Management." DSSResources. com. 07 Oct 2005. Web. 08 Nov 2014.