



## Activity 7.2 – Case Study

### Purpose

A case study is done in order to get a broad perspective of the engineering profession. Engineering is more than mathematical calculations and applications of physics. Engineering has to be about impact on people's lives, both positive and negative. It is about tradeoffs and compromises. We need to learn about when the process fails in order to prevent future failures of the same type.

### Materials

Internet  
Journals

### Procedure

You are to research an event in which some catastrophic failure occurred, and write a technical report. The report should include a factual account of the event (like a newspaper report) including a summary of financial and human losses, a technical description of the part or parts that failed, a determination as to why the part(s) failed, a technical description of how the failed part(s) were intended to work (i.e., the designed intent), and a conclusion of any changes in design, regulation, or procedure to prevent similar failures in the future.

You will be expected to deliver a short oral report about the incident and be prepared to answer questions

You may choose your own event but be sure that the failure is known to have occurred due to an engineering cause (the sinking of the Titanic is not an engineering failure, but an error in human judgment. No ship is designed to be run at full speed into a large, solid, and relatively immovable object such as an iceberg.) You will have two weeks to research outside of class.

This is a list to get you started with the Catastrophic Failure research assignment:

- Kansas City Hyatt Regency Hotel
- Ocean Ranger (oil drilling rig)
- Shuttle Challenger
- USS Squalus
- I-90 Highway Bridge over the Schoharie Creek
- Kemper Arena
- Baldwin Hills Reservoir
- Cargo Doors on DC-10 aircraft

Ferrybridge Cooling Towers  
Three Mile Island  
Mohawk Airlines flight 405 (March, 1972)  
Liberty Ship "Schenectady" (during WWII)  
Tacoma Narrows Bridge  
Titan Missile Silo (Georgia)  
Apollo 1  
Soyuz 1  
Chernobyl  
Lockheed Electra  
Ford Pinto  
Chevrolet Corvair  
Concorde SST  
Kansai International Airport  
Tay Bridge (1879)  
Buffalo Creek Dam (1972)  
Mars Climate Orbiter  
Ford Pinto

## Conclusion

1. You are a highway designer for the state. ABIG City is severely crowded and traffic grinds to a halt on a regular basis. You have worked for a year to design a beltway around the city with feeder roads running through the city center offers relief from long lines of traffic. When you unveil the plans there are some who think it will save the city, others who are violently opposed. Why would some people think the plan not worthy?