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Causes of the Challenger Space Example

Timeline of events and causes of the Challenger Space shuttle accident In 28 January 1986, the Space Shuttle Challenger was launched for the Last time and exploded less than 2 minutes after the lift-off resulting in the deaths of all seven crew members on board (Space shuttle challenger: Wikipedia, 2006). The failure of the solid rocket booster o-rings was attributed to several factors, including faulty design of the solid rocket boosters, insufficient low temperature testing of the O-ring material and lack of communication between different levels of NASA management. A timeline of the events leading up to the explosion of the Challenger Space shuttle: (Times in EST) January 22 [3:43 p. m.]Lift-off was initially scheduled on this date January 25Delayed again due to bad weather; launch postponed for one day. Re-scheduled for Jan 27, [9:37 a. m. EST]. January 27Delayed for another 24 hours when ground servicing Equipment hatch closing fixture could not be removed fromorbiter hatch. January 28 [11:38 a. m.]Space shuttle Challenger finally lifts off [11:39:13 a. m. Space shuttle challenger explodes in mid-air (Space shuttle challenger: Wikipedia, 2006) NASA managers were anxious to launch the Challenger for several reasons, including economic considerations, political pressures, and scheduling backlogs (ethics:

education, 2003). It is important that these managers do not ignore their own engineering experience, or the expertise of their subordinate engineers. Often a manager, even if she has engineering experience, is not as up to date on current engineering practices as are the actual practicing engineers. Another issue is the fact that managers encouraged launching due to the fact that there was insufficient low temperature data. Since there was not enough data available to make an informed decision, this was not, in their opinion, grounds for stopping a launch. This was a reversal in the thinking that went on in the early years of the space program, which discouraged launching until all the facts were known about a particular problem. Once functional, the shuttle became exposed to operational demands from a multitude of users as NASA endeavoured to live up to its promises. Coordinating the needs of political, commercial, military, international and scientific communities placed immense pressures on the shuttle management team (nasa: government, 2006).

- Political pressure to provide a reliable reusable space vehicle with rapid turn-around time and deployment seriously hindered the ability for effective systems integration and development.
- It was not feasible to construct any complete management support systems that could integrate all of the factors associated with such a diverse group in the operational environment.

The push of the Reagan administration to declare the shuttle 'operational' before the 'developmental' stage was completed created uncertainty and low NASA employee morale. The process of 'selling' the concept of a re-usable space transportation system to the American public and its political system started in the late 1960's, following the successful Apollo mission. The space shuttle was approved as a method for operating in space without a firm definition of what its goals would be (unlike previous NASA programmes). Support for the project, both politically and economically, was not very strong (nasa: government, 2006). These factors created an environment in NASA preceding the Challenger launch which was one of conflict, stress and short cuts. Additionally, previous 24 successful shuttle missions had created a false sense of security in NASA officials. There was thus no formal 'decision support system' for shuttle operations prior to the Challenger launch (space shuttle : resources. com, 1997). Characteristics of decision making were short cuts, compromise, operational expediency, and complacency. This complacency meant that NASA managers looked for evidence to support mission success rather than evidence indicating possible mission failure (nasa: government, 2006). The effect of these factors is indicated clearly in the decision to launch. Therefore, the NASA managers played a significant role in the decision to carry out the launching which resulted in the catastrophic flight. These top

managers from NASA should be held accountable for their decision, since it was not based on the engineers' recommendation, not to go ahead with the launch. Communications did not flow effectively from the top management of NASA to middle level management. A high ranking manager from NASA had actually bypassed his engineers who had all the sufficient information for the launch and gone directly to a middle level manager to seek his opinion. Recommendation • Managers should not ignore their own engineering experience, or the expertise of their subordinate engineers. Do not allow political sources to override the organizations decisions. • All decisions made must put safety first and operational goals last and not vice versa. • Open and free communication must be encouraged among all levels of management Personal Comment I would have supported my senior engineers to cancel the launching of the space shuttle and suggested to the NASA management to reconsider their decision to launch and wait until further testing of the o-rings under low temperatures were undertaken since this was a critical component of the booster. Reference ethics: education. (2003). Retrieved from <https://ethics.tamu.edu> nasa: government. (2006). Retrieved from <https://www.ksc.nasa.gov> space shuttle : resources. com. (1997). Retrieved from <https://dssresources.com> Space shuttle challenger: Wikipedia. (2006). Retrieved from Wikipedia: https://en.wikipedia.org/wiki/Space_Shuttle_Challenger_disaster