

Exercise 2 – Challenger Shuttle incident

Part a) See the opening section of the publication by Lynch and Kline (2000) for some salient points about the decision to launch the Challenger Shuttle. Some key points that have been commonly reported about the investigation. During the development, manufacture and use of the shuttle

- Insufficient funds and time allocated
- Poor management style and competing goals within the programme
- Priority to other outcomes (loss of commercial reputation, related to ability to launch)

Many reports on this incident also refer to a teleconference on the evening before the launch

- The engineering contractor (Morton Thiokol) was reportedly reluctant to not launch, but it is arguable that there was insufficient consideration of this.
- NASA were “not happy” and expressed opinion in a teleconference that the data were inconclusive
- (offline) Managers from Morton Thiokol looked for evidence to launch and took a vote that excluded the engineers. Apparently there was insufficient deliberation on ethical and safety issues.
- (back online) The Morton Thiokol managers read a list of the rationale that supported the launch
- NASA accepted this with no discussion
- NASA put pressure on Morton Thiokol to prove that it was not safe to launch, rather than prove that it was safe to launch.

Think about the Moral decision-making process discussed in content for this session on ethics (Beabout and Wennemann, 1994)? What are some of the important things to think about here and were the actions likely to be ethical?

Intent – what was the intention (often purposely or knowingly)

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Motive – why was something done (reason behind the intent)

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Circumstance – did the circumstances warrant the action, were there alternatives?

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Decision - who made the decision and how and were they prepared to accept the consequences of the decision.

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Action - are various courses of action considered, do those involved accept the responsibility for their actions?

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Can you think of ways in which these problems could have been avoided?

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Part b Now think about the different meetings and communications that were part of this “decision to launch”.

- Internal at Morton Thiokol – engineers
- Morton Thiokol managers to NASA
- Morton Thiokol managers consulting again with engineers
- Morton Thiokol managers
- Morton Thiokol managers reporting again to NASA
- Internal at NASA

Select 2 or 3 examples of the meetings listed above and then write some brief notes on the following:

- nature of those meetings and type of discussions
- who was involved, their roles
- what would have been discussed,
- what pressures were people facing,
- what could have influenced their decisions.

This should help you to understand some of the complexity in the situations leading up to and during decision-making. These are not simple situations and decisions are rarely taken by an individual, with all of the information that is needed to hand.

Case studies like Challenger can be helpful in exploring these situations and enable you to think about and discuss the kinds of pressures that may be face by engineers. Some important features of case studies are summarised below.

- Scenarios in case studies enable consideration of Individual decisions, though these are more likely as part of a group – team dynamics, organisational culture are important
- Scenarios can be broadened to consider implications of engineering for societal issues – e.g. impact of new technology on the community
- Scenarios need to focus on the ordinary rather than the extraordinary – they should be realistic, engaging, provocative
- They should enable discussion, allowing those involved to take different perspectives of the range of stakeholders that may be involved
- Cases studies can be based on real events, adapted from real events, or developed by students to focus on issues of interest

