UNIVERSITY OF LIVERPOOL

Engineering Ethics B

Department of Electrical Engineering & Electronics

Module Code: ELEC222

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Declaration

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Scenario 1: Aircraft Fleet

1. The Dilemma of Scenario 1

You are a junior engineer member of one of the regular maintenance teams and was given order by the Head Office to replace the pump casing studs of the jet fleet in your charge as a matter of emergency. However, after examination, you are convinced that the new studs for replacement are deficient in quality and will constantly present threats to the safety of the jets. You feel responsible to pose the question, yet you are expected to just follow orders on your position and this action may have deleterious effects on your upcoming promotion.

2. Analysis and Discussion of Scenario 1

Based on the Scenario, the engineer generally has three solutions to his dilemma:

2.1 Possible choices

a. The engineer will disregard his concern for the studs' replacement which may cause serious safety problems and consider himself sharing no responsibility for any possible consequences since he is just obliged to follow orders given by his superior.

b. Out of string sense of responsibility and justice, the engineer will refuse to carry out the order and reveal the serious mistake made by the Head Office.

c. The engineer will try to 'technically' communicate his concern to the one directly responsible for the decision to see if any improvement could be made. If it does not work, he should recommend his supervisor/the Head Office that the work cannot be advanced without a fixed alternative method. In the worst case that nothing is changed, he should inform the public media/relevant government authorities of the issue.

2.2 Analysis of the stakeholders' interests

In general, there are 3 stakeholders involved in the incident: the junior engineer, the maintenance company and the passengers/general public whose lives and property are under threat due to the deficient pump casing studs.

a. the engineer

First of all, the job as a member of the maintenance team is very important to the engineer and he shares some common interests with the company. Not only the engineer earns income from the position to support himself/his family, but he also applies his professional skills and expertise to create values to others and fulfil his talents and potentialities. A desired promotion will greatly improve the situation.

On the other hand, as a professional, the engineer is bound by corresponding ethical principles. In the Scenario, he examined the studs with Accuracy and Rigor in practice and was competent to discover the potential threats to public safety. However, Accuracy and Rigor alone is not the only thing that the engineer needs to uphold. In this case, Honesty and Integrity, Respect for Life, Law, and the Public Good and Responsible Leadership are no less important.

Thus, in this case, the engineer should uphold the code of engineering ethics and at the same time try to minimize the detrimental effect of this incident on his career.

b. the company responsible for maintenance

A most important goal of a company is to make profits legally under the guidance of business ethics. In the Scenario, using rolled-threads studs instead of cut-threads may cost much more in the short term (which means less profits). However, considering the potential cost of scandal, lawsuit and compensation, the company may be rather wiling to choose to use high-quality studs if well-informed of the risks come with the deficient studs.

c. the passenger/general public

In the Scenario, the deployment of deficient studs can pose serious threats to passengers' and general public's lives and properties. Using high-quality studs for replacement will maximize this party's interests by securing their safety and can avoid future accidents.

3. Recommendation for Scenario 1

With the first choice, the engineer may have 'well' finished his job and got promoted later. However, he failed to uphold the ethical principles of engineers. He only acted in the best material interests of himself, but breaking the principles of Honesty and Integrity, Respect for Life, Law and the Public Good, Responsible Leadership. As a result, a time bomb was left undealt with and the company's future and the passengers'/ general public's lives and properties will be under constant threat. Eventually, this may come back to the engineer and bring him into trouble one way or another.

With the second choice, the engineer directly rejected his obligation to obey the job without informing his employer the situation and publicize the usage of deficient studs. Though he showed his Respect for Life, Law and the Public Good, the engineer can hardly be credited for not informing and listening to the employers' opinion which is NOT Responsible Leadership and his acts that harming greatly both his own interest and his employer's interests are NOT in a reliable and trustworthy manner which may violate the Honesty and Integrity principle. The only foreseeable positive influence is that the public will be well-informed of the 'scandal'.

With the third choice, the engineer tried to communicate his concerns of the studs to his employer in a reliable way and tried to prevent professional misconduct, which demonstrated the principle of Honesty and Integrity; he considered the health and safety of others, which demonstrated the principle for Respect for Life, Law and the Public Good (Most important in this case); in case no change is made by the company to the situation, he tried to use public media to inform the public and report this incident to relevant authorities, which demonstrated the principle of Responsible Leadership: Informing the society of potential danger that caused by mal-engineering. By this choice, hopefully, the heads in charge of the project may be aware of the

seriousness of the problem and make improvements to the original plan – using the high-quality rolled-threads studs. Then, both the company's long-term interests and passengers'/general public's safety and interests are safeguarded. Meanwhile, the engineer's promotion will not be hindered since he communicated with the concerned ones in a "technical" way rather than in a straight forward formal conference when unnecessary.

Conclusion: the third choice is the best as explained above.