BURNING ICU WARD AT HOSPITAL SULTANAH AMINAH AND THE CRASH OF VALUJET FLIGHT 592

Muhammad Syafiq Bin Adbullah, Muhammad Syukri Bin Sulong, Muhammad Munawwar Bin Daud ,
Wan Muhd Amirul Hafiz Bin W Azhar, Syed Ikmal Amri Bin Syed Mohamed,
Siti Nurfadilah Mohamed Zaid

***Abstract* - A case study was conducted to identify the details of the fire accidents that occur at Hospital Sultanah Aminah (HSA) on 2016. At 9 am on 25th October 2016, a blaze broke out at the hospital intensive care unit (ICU) level 2 causing multiple deaths and injuries. The total of deaths and injuries reported by Head of Fireman are 6 deaths and 3 injuries.. One of the staff has been warded at the HSA due to 80 percent burns on his body and two of them were transfer to the Hospital Sultan Ismail (HSI). Unfortunately, on the next day, the nearby operation theater also was caught by fire due the cleaning process of the burnt ICU that cause injuries of 3 nurses due to the first fire accident due the spark from old capacitor that attach to the ceiling fluorescent. Another factor that cause this fire accident become worse because of flammable material in the ICU such as curtains, patient cloth, bed sheet and the oxygen tanks. For the second fire accident, the main cause was the short circuit of the socket because of water from the cleaning process of the previous accident.. The transfer process of patients while fire accident occured also not smooth. Within 1990 to 2016, there were 19 fire accident has been recorded happened in HSA. Out of 19, 15 of the accidents were happened after 2008 and the main causes were from careless of hospital management.**

The second case study is about crash of Valujet Flight 592 on 11 May 1996. ValuJet Flight 592 was a regularly scheduled flight from Miami International Airport to Hartsfield–Jackson Atlanta International Airport. ValuJet flight 592 transporting 105 passengers and 5 crew member from Miami, Florida to Atlanta, Georgia. 10 minutes after taking off, the ValuJet Airlines McDonnell Douglas DC-9 crashed at the Florida Everglades resulted in the deaths of all 110 passengers. Fire was ignited by oxygen-generator canisters and started in the cargo area of the aircraft. The oxygen tanks were the responsibility of SabreTech, ValuJet's maintenance contractor which have done improper maintenance on the oxygen generator canister.

I. COMPANY INTRODUCTION

A. Mission

We are a mission-driven company that aims to set the standards of excellence for engineering sector. We are building a business in which high standards permeate all aspects of our company. Quality is a state of mind at Ad Tech.

B. Visions

Our trademark is "*Integrity, Innovative and Faith*."

C. OBJECTIVE

- A consulting or consultancy firm is a business of one or more experts (consultants) that provides professional advice to an individual or an organization for a fee.

- *Our company main focus is on engineering sector*.

- *We will provide the latest research on communication engineering to manufacture company.*

D. ORGANIZATION CHART

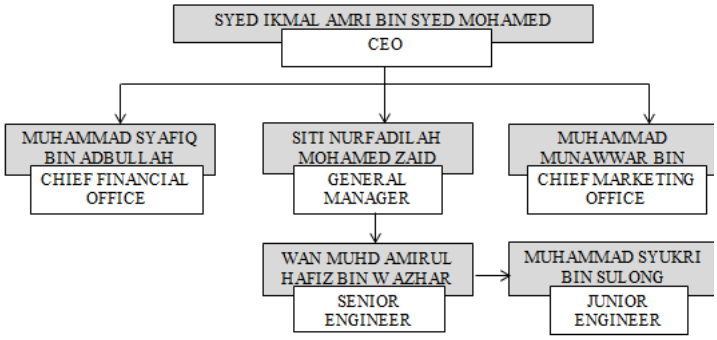

Figure 1 *The organization chart*

E. CARD ID AD TECH

Figure 2 *The card of employee*

F. WEBSITE

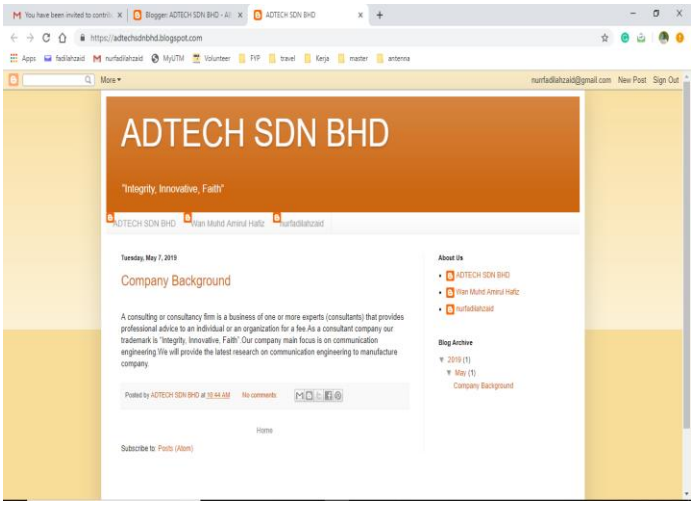

Figure 3 *The website of AD TECH*

II. LITERATURE

A. CASE STUDY VALUJET

ValuJet was one of the generation of new discount airlines that sprang up as the result of airline deregulation in the 1980s. Based in Atlanta, it offered cheap fares to Florida and other popular destinations. ValuJet hires subcontract to perform many of the routine operations that keep an airline flying. Many major airlines perform aircraft maintenance themselves, but different to valuejet. ValuJet hire the subcontract that is Sabretech to do the maintenance.

For overview of the accident story, on 11 may 1996, ValuJet flight 592 transporting 105 passengers and 5 crew member from Miami, Florida to Atlanta, Georgia. After 10 minutes after taking off, ValuJet airlines McDonnell Douglas DC-9 crashed at the Florida, Everglades. Resulted of the crash, the deaths of 110 passengers aboard the aircraft. The crashed is caused by a fire. The fire started in the cargo area in the aircraft. The fire was ignited by oxygen generator canisters. All the maintenance is responsible by the ValuJet's maintenance contractor that is SabreTech. This is also included the replacement of the oxygen tank. The oxygen canister in the DC-9 are located above the passenger seats. The oxygen is used to provide oxygen to the passengers through mask. It is important for emergency situation. As the oxygen canister start working, the temperature will increased. The surface temperature of the canister can be as high as 260®C when used.

For further understanding of this crash, understanding of how the oxygen canister work is important. The canisters contain a core of sodium chlorate, which is activated by a small explosive charge. This small explosion is initiated when the passenger pulls the oxygen mask toward herself. A chemical reaction within the canister liberates oxygen, which the passenger breathes through the mask. During use, the surface temperature of the canister can be as high as 260°C, which is normally not a problem, since the canister is mounted so that it is well ventilated. To ensure that they will operate properly when needed, the oxygen-generator canisters must be replaced periodically.

SabreTech done many mistake in this case. When canister are removed, a bright yellow safety cap must be installed. The Valujet maintenance rules made it clear. SabreTech didn't have any of these safety caps on hand while they were performing this work instead just using tape. The fives boxes of canister that is not use will be send to ValuJet headquarter in Atlanta because this is the property of ValuJet. The oxygen canister is not fully empty. The sabreTech staff lying and tell that the canister is empty. The second mistake is the canister loaded it on the cardboard with the flammable item and beside it is tire full of air. The Valujet ramp agent accepted the load despite

the fact that Valujet was not certified to carry hazardous wastes such as empty oxygen generators, which contain a toxic residue from the chemical reaction. The flight's copilot also looked at the load and the shipping ticket but apparently he didn't think that there was a problem with carrying this cargo.

The flight take off normally but after six minute, the canisters was jostled and the explosive charge ignited. As the chemical reaction proceeded, the canister got extremely hot, especially since the canisters were in a box and were not ventilated as they are when mounted in the airplane. When the oxygen canister on fire, it effect all the cargo load. The fire increase and become bigger. The fire makes the wire in the plane melt and short circuit happen. After the plane lose electricity, the plane cannot operate anymore so the plane will go down and crash.

The State of Florida filed criminal charges against SabreTech, charging the company with 110 counts of murder, 110 counts of manslaughter, and various charges related to the improper handling of hazardous materials. Initially, the jury in the trial found SabreTech guilty of some of the criminal charges. This was the fi rst time a criminal guilty verdict had been returned against a corporation in the United States. After much legal wrangling, many of these guilty verdicts were thrown out by an appeals judge. Ultimately, SabreTech agreed to plead no contest to a single count of mishandling hazardous materials and to make a $500,000 donation to a fund supporting airline safety causes. This outcome dismayed many of the accident victims' families. SabreTech is no longer in business.

Figure 4 *The ValuJet Crash*

B. CASE STUDY HOSPITAL SULTANAH AMINAH

On 25 October 2016, the fire broke out at Intensive Care Unit(ICU) located on the second floor of the Hospital Sultanah Aminah (HSA) Johor, Malaysia. The Fire & Rescue department confirmed that seven patients critically ill and six of those had perished in the blaze. One person was successfully rescued but suffered 80 percent burn on his body.10 trucks and 166 firefighters from Johor Bahru, Tebrau, Kulai and Johor Jaya was rushed to the HSA. Actually, they are two accident happen in HSA and it was on different day. After that, on 26 October 2016, the second accident occur at Operation Theatre(OT) in same building. The accident has caused evacuation process and 3 injured nurses. The chronology of the accident is shown in Figure 2.1.

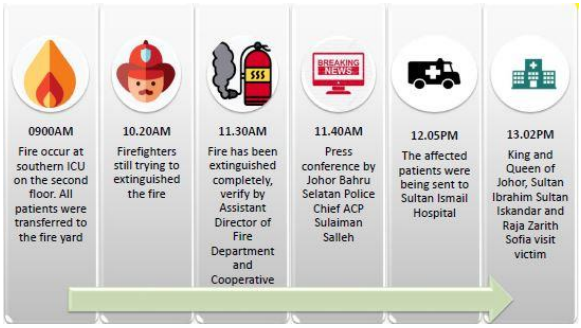

Figure 5 *The accident chronology*

The main factor of the first incident is the capacitor in the lamp was burn and it hit flammable material such as curtain, bedsheet and

patient clothes. Oxygen tank in ICU ward also affect the burning and it became worse. As we know oxygen is a reagent that will react with fire and make the fire spread widely. Due to a lot of oxygen tank and hospital ventilation, the fire become more furious and burnt all over the ICU ward.

The another factor that influence the second incident is short circuit that happen at the plug socket that exposed to the water from the cleaning process from the first burning. The cleaning process at ICU ward is not follow the guidelines of safety. Fortunately, there was no death accident occur and only a few victims that have difficulty in breathing because of exposure to fire smoke.

Figure 6 *The HAS Burning*

III. ANALYSIS AND DISCUSSION

A. CASE STUDY VALUJET

On May 11, 1996, ValuJet flight 592 crashed in the Florida Everglades killing all 105 passengers and five crew members. The technical cause of the crash was a fire that erupted after one or more oxygen generators exploded in a cargo compartment. Governmental investigations have indicated that both ValuJet and SabreTech (an airline maintenance company) failed to comply with a host of regulations concerning the presentation, storage, and transportation of hazardous materials by air. More generally, however, the Federal Aviation Administration (FAA) has been found to be negligent in its oversight of airlines by not adequately monitoring the general safety of commercial aircraft as well as by its refusal to institute safeguards and guidelines that would have protected passengers and crews from crashes like that of flight 592.This paper follows the tradition of state-corporate crime theorizing and research by identifying the organizational and structural forces that contributed to the ValuJet crash. This includes an examination of the FAA's contradictory roles as both regulator and supporter of the airline industry, as well as a discussion of both ValuJet's and SabreTech's violations of federal air safety regulations.

From the case, the Federal Aviation Administration (FAA) has been found to be negligent in its oversight of airlines by not adequately monitoring the general safety of commercial aircrafts as well as its refusal to institute safeguards and guidelines that would have protected passengers and crews from crashes like that of Flight 592. The case study of the disaster highlighted the broader structural policies that contributed to the crash (deregulation and unbridled capital accumulation) but also addressed the very specific items marginalized or overlooked by the FAA that can be directly linked to the deaths of those on ValuJet Flight 592. These include ignoring two clear recommendations by the National Transportation Safety Board (NTSB) to placed smoke detectors in cargo holds exactly like the area in which the fire started on Flight 592, and reclassify cargo holds so that they would contain a fire and not spread to the rest of the plane.

Therefore, there is strong evidence to suggest that the FAA did not compel airlines to upgrade these particular safety features because they would not be cost-effective.

Thus, the state fails to provide the necessary mechanism to effectively balance or control the corporate activity. Often, a concept of "nested contexts" is introduced to show there is always a political economy that shapes the conditions for state-corporate facilitated crime, particularly when failures of regulation are discussed. For instance, Matthews and Kauzlarich portrayed the crash of ValuJet Flight 592 as an example of state corporate crime, demonstrating how ValuJet and SabreTech (an airline maintenance company) failed to comply with regulations regarding the storage and transport of hazardous materials, while the Federal Aviation Administration was negligent in overseeing and monitoring the airline industry.

The state-corporate crime paradigm has been implemented in several cases. The events leading up to the ValuJet Flight 592 crash on May 11, 1996, in the Florida Everglades has been argued to constitute a state-corporate crime ValuJet and SabreTech (an airline maintenance company) did not comply with safety regulations regarding the storage of hazardous materials on airline flights and the inadequate enforcement of such regulations by the Federal Aviation Administration (FAA) resulted in five crewmember and 105 passenger deaths.

B. CASE STUDY HOSPITAL SULTANAH AMINAH

Based on the incident happen in HSA, it has cause many people making speculation and questioning to the person and agency that responsible to this accident. Actually, they are a few cases of burning accident in HSA within 10 years. One of the factor that cause the fire accident at HSA is lack of fire drill practice. Fire drill is a method of practicing how a building would be evacuated in the event of fire or other emergencies. Generally, the evacuation is timed to ensure that it is fast enough and problems with emergency system or evacuation procedures are identified to be remedied. The duration of most fire drills is between five and 15 minutes. Drill times can vary from building to building, depending on many factors, such as speed of evacuation, building size and fire alarm systems. The HSA should make sure that they are ready to apply fire drill procedure in real time. One of the factor that HAS cannot practice fire drill is because the need to inform the public and patients in advance or else they will thought real burning cases is happen. Furthermore, the maintenance sector need to monitor all electrical equipment. Electrical equipment is an important thing that need attention because it is widely used in hospital sector.

IV. CONCLUSION

The engineering codes of ethics show that engineers have a responsibility to society to produce products, structures, and processes that are safe. There is an implied warranty with regard to all products that they will perform as advertised a bridge should allow automobiles to cross from one side of a river to the other, and a computer should correctly perform calculations. Similarly, there is an implied warranty that products are safe to use. Clearly, nothing can be 100% safe, but engineers are required to make their designs as safe as reasonably possible. Thus, safety should be an integral part of any engineering design. No duty of the engineer is more important than the duty to protect the safety and well-being of the public. Indeed, the codes of ethics of the professional

engineering societies make it clear that safety is of paramount importance to the engineer.

VALUJET CRASH	HSA BURNING
Procedural	Political
Engineer	Medivest Sdn. Bhd.
Competitive	Ministry Of Health

Table 1 *The different ValuJet Crash and HAS Burning*

REFERENCE

1. Langewiesche, W. (1998). The lessons of ValuJet 592. Atlantic Monthly, 281(3), 81-97.

2. Fishman, D. A. (1999). ValuJet Flight 592: Crisis communication theory blended and extended. Communication Quarterly, 47(4), 345-375.

3. Matthews, R. A., & Kauzlarich, D. (2000). The crash of ValuJet Flight 592: A case study in state-corporate crime. Sociological Focus, 33(3), 281-298.

4. Englehardt, K. J., Sallot, L. M., & Springston, J. K. (2004). Compassion without blame: Testing the accident decision flow chart with the crash of ValuJet Flight 592. Journal of Public Relations Research, 16(2), 127-156.

5. Matthews, R. A., & Kauzlarich, D. (2012). The crash of ValuJet flight 592. Crime Types: A Text/Reader, 3(3), 373.

6. Liew, B. S., Johari, S. A., Nasser, A. W., & Abdullah, J. (2009). Severe traumatic brain injury: outcome in patients with diffuse axonal injury managed conservatively in hospital Sultanah Aminah, Johor Bahru–an observational study. Medical Journal of Malaysia, 64(4), 280-288

7. Zaremba, T., Tayal, B., Søgaard, P., Ramsamy, G., Jiyen, K., Abdullah, H., ... & Archambault, M. (2017). QUICK FIRE CASES-SESSION III. European Heart Journal-Cardiovascular Imaging, 18(suppl_2), ii124-ii127.