

Exxon valdez oil spill disaster



**ASSIGN
BUSTER**

The Exxon Mobile had failed to focus on its corporate social responsibility and its objectives when the Exxon Valdez oil spill disaster had happened – which is to ensure the protection and safety of the people and the environment. The entire petroleum industry – particularly the oil refinery industrial have different processes and procedures that are somewhat harmful to the environment and the health of the people. Different researches from the past showed that the fault of Exxon Mobile focus on its outdated machines, equipments and needed technologies, maintenance and development process, together with the lack of practices and programs related to its personnel or crews, particularly the issue of substance abuse. It also showed that the local and national government is also at fault, because of its lack of effort in monitoring the activities of safety-sensitive companies such as Exxon. In the end, until now, the results or outcomes of the oil spill can still be felt by the locals, particularly – which focus on their economic, environmental, social and cultural lives.

1. 0 Introduction

On March 24, 1989, one of the most devastating human-caused environmental disaster had happened in Prince William Sound, Alaska when the Exxon Valdez, an oil tanker bound for Long Beach California had struck to Bligh Reef of Prince William Sound's, which resulted to the spill of 260, 000 to 750, 000 barrels or equivalent to 41, 000 to 119, 000 m³ (Bluemink, 2010). The vessel was travelling outside normal shipping lanes in order to avoid ice. Within 6 hours of the grounding, the Exxon Valdez spilled 10. 9 million gallons of its 53 million gallon cargo of Prudhoe Bay Crude, 8 out of 11 tanks on board were damaged. As a result, the event affected more than

1, 100 miles of non-continuous coastline in Alaska, which made Exxon the largest oil spill in the history of waters in the US (HMRAD, 1992).

This event had caused many negative effects towards the affected area. It had affected the environment, which caused economic impact to the living of the people, consequently their social aspects. This paper will present the objectives of Exxon Mobil Corporation, particularly in connection to the environmental factors. It will also present the different procedures and processes involved in oil and refinery industry. Furthermore, it will also analyze the different factors and areas which resulted to the oil spill and present the different impacts or influence of the oil spill towards the economic, environmental and social aspect of Alaska. Above all, it will also present the changes in management system of Exxon and the government in order to prevent the same event from happening.

3. 0 Exxon Mobil Corporation

Exxon Mobil Corporation is the largest publicly traded international oil and gas company which offers energy which enables to strengthen growing economies, at the same time, improve the living standards of the people around the world (ExxonMobile. com, n. d.).

The company is committed to being the premier petroleum and petrochemical organization in the world. Thus, it focuses on continuously achieving its superior financial and operating results, at the same time, adhering towards the highest standards of business conduct. In line with this, the company focuses on its commitment with its stakeholders: to enhance long-term value of money entrusted by the shareholders; to consistently

satisfy the ever-changing preferences and demands of the customers; to hire and retain the most qualified people available and improve their opportunities towards success by training and development; and to be a good corporate citizen in all places that the company operates (ExxonMobile.com, n. d.).

4.0 The Oil and Refinery Industrial Processes and Operations

When crude oil is produced from oil reservoirs deep within the earth, it has different molecules that must be separated in order to produce the products that are used today (Articlesbase, 2007). There are three main types of operations that must be done in order to come up with the finish products: separation, transformation or conversion and upgrading.

4.1 Separation

Separation is the process of obtaining the different types of products from the heaviest to the lightest (Total, n. d.). Continuous distillation is the most important form of separation technology used in chemical process industry and biotechnology enterprises, particularly in the petroleum refineries and natural gas processing plants. It is a process where in a more volatile component is separated from a less volatile element by supply of energy to heat the liquid. Figure 1 shows the schematic process used by Exxon-Mobil. Distillation is considered as the oldest and the most widespread refinery process. It is based on the standard that liquids with different boiling points can be separated by vaporization and condensation. Crude oil distillation entails the process of feeding crude oil at its boiling point of 400°C into a large fractionation column. The oil is split up into a series of product fractions

which are reliant on the desired boiling point ranges. Vaporized oil on its way up via the column encounters condensed liquid that is on its way down. They are made to come in contact and exchange components at a number of sieve trays in the column. This contact causes light fluid molecules to vaporize and heavy gas molecules to condense. The further up the column, lighter is the fluid found at the sieve tray. Part of the crude oil that cannot be vaporized is extracted as heavy oil at the bottom of the column (Sharma, 2007).

Figure 1 Refining of Crude Oil into Fractions Process in Exxon-Mobil

Source: (Sharma, 2007)

4. 2 Conversion

Transformation is the process of altering the natural proportions of each type of products to respond to the demands of the consumers. The demand of the market is for large quantities of light products; however, the separation process has given vital proportions of heavy fractions. Thus, it is important to break down the heavy molecules to small pieces. The most popular process that is used in converting heavy to light products is the catalytic cracking. It is being done at high temperature of 500°C, in the presence of a catalyser – a substance that promote chemical reactions without participating directly in them. This treatment is very extreme because more than $\frac{3}{4}$ of the heavy fractions are being transformed into gas, petrol and diesel (Total, n. d.).

4. 3 Upgrading

Upgrading is the process of eliminating the undesirable compounds and modifying the attributes of a specific product in order to make them

<https://assignbuster.com/exxon-valdez-oil-spill-disaster/>

compatible with the norms. The products from the distillation and conversion processes have to be stripped of molecules in given sulphur, which are considered as corrosive or risky to the environment. As figure 1 show, the desulphurization of diesel is being done at 370°C, under a pressure of 60 bars and in the presence of hydrogen. Then, the sulphur atoms will leave the hydrocarbons and bond with the hydrogen in order to create hydrogen sulphide - H₂S. This product will then be treated in order to separate the sulphur, which results to large yellow heaps that one sees in the refinery yards. Currently, sulphur is stocked in tanks, being maintained at a temperature that is adequate enough in order to maintain its liquid state (Total, n. d.).

4. 0 Risks in Oil Refinery Process: Causes of the Disaster

The Exxon Valdez oil spill disaster can be considered as an industrial crisis or disaster. Industrial crises are defined as those processes of major harm and disruption which are caused by hazardous industrial products or production systems. These crises are rooted from industrial organizations, activated by industrial accidents – organizational failures compound the impacts of the accidents. In the end it causes major damage to the environment and all living things. In addition, it also disturbs connected organizational, economic, social, political and cultural systems (Mitroff, Pauchant and Shrivastava, 1988; Morin, 1993).

The HOT + RIP framework of Shrivastava et al. (1988) shows the contributory factors to the failures. This includes Human, Organizational and Technological (HOT) – internal factors; and Regulatory, Infrastructure and community Preparedness (RIP) – external factors. Figure 2 shows the failures <https://assignbuster.com/exxon-valdez-oil-spill-disaster/>

and their domains. Most often than not, technological failures trigger accidents. On the other hand, the human and organizational context of technology motivates preconditions for accidents, at the same time; escalate damages from accidents due to the inadequacy of resources in order to cope with the impacts (Shrivastava, 1994).

Figure 2 Reasons of Industrial Crises

Source: (Shrivastava, 1994)

Source: (Shrivastava, 1994)

The study of Shrivastava (1994) showed the different reasons behind the failure of Exxon. The relevant technological system was the ship or the tanker of oil. The study showed that the internal and external factors which caused the failure of Exxon are:

4. 1 Failures in Technological System (Ship and Tanker)

The technological system factors are:

Design deficiency in the ship – the lack of double hull on the ship increase the probability of oil spillage;

Outdated communication equipment, which caused lost in touch between the port and the Coast Guard during crucial moment;

The captain in command of the ship was under the influence of alcohol;

Third mate in control of the vessel was unqualified and fatigue, which caused it to head of the Sound;

Shorthanded crew in the tanker (in average, small tankers have 40 men, while Exxon Valdez has only 24; during the accident, only 20 were on duty) ;

Wrong procedure ordered by the captain (the helmsman was asked to place the ship on auto-pilot by making complex maneuver through ice flows);

The crew on board the ship had low alcohol beer which is against the safety policy of the ship (Shrivastava, 1994).

4. 2 Failures in Organizational System

Failures in the organizational systems are:

Insufficient treatment program for substance abuse for personnel and employees;

The lax security system permitted a drunk captain and alcoholic drinks aboard the vessel;

The top management of Exxon failed to monitor the different safety issues and has misperception of threats in transporting oil;

The Exxon Shipping Company failed to offer a fit master and an adequate and rested crew to run the ship due to the cost cutting pressures;

Insufficient follow-up of the organization regarding the drinking problem of Captain Hazelwood. This is in spite of suspension of the Captain's automobile driver's license due to drinking;

The emergency plan of Exxon was unrealistic and poor which resulted to inability of the company to contain the spill (Shrivastava, 1994).

4. 3 Failures outside Exxon

The different external failures in Exxon which caused the disasters are:

Insufficient Vessel Traffic Service (VTS) and efficient pilotage service, together with the poor and outdated equipments and gadgets, not enough number of crews and personnel and poor training of the personnel;

5 separate government emergency plans have failed in containing the spill. These are: the national contingency plan, the regional contingency plan, the on-site coordination plan, the state emergency response commission plan under SARA Title III, and the spill prevention, control and counter measures program by the Clean Water Act;

The state of Alaska had failed to mobilize permissions, equipments, tools and personnel which could help to decrease or subside the effects of the spill as authorized by the state law;

The US Coast Guard failed to monitor and observe the unpredictable and inconsistent behavior of the Exxon Valdez as it swerved outside the shipping lanes (Shrivastava, 1994).

5. 0 Impacts of the Disaster

The oil spill disaster had caused economic, cultural and social impact over the people or citizens in Alaska.

5. 1 Economic Impacts

In particular, the oil spill had affected trade of Alaska, particularly the industry of fishing in the region. It is recorded that the fishermen and native Alaskan had lost an estimated price of \$1 billion, while the native fishermen <https://assignbuster.com/exxon-valdez-oil-spill-disaster/>

are said to have lost a total of \$580. 4 million, because the oil spill affected the reputation of the Alaskan salmon and additional of \$154. 8 million because of the damage to the ecosystem and depleted stocks of fish (Fernando, 2009).

As a result, the tourism industry was also affected by the spill, which resulted to vital financial losses to the region. In addition, it also affected different industry, sectors and segments in the region, which include tour packages to Alaska, guided outdoor activities, charter and sightseeing boats. At the same time, it is also declared that the image of the natural environment in Alaska was tarnished forever (Fernando, 2009).

Above all, it had affected the energy industry in the USA. The Prudhoe Bay field in Alaska account for 25% of the domestic petroleum production in the US. The oil spill resulted to drastic cut back of production at Prudhoe Bay from 2 million barrels per day to 800 thousands. Consequently, Los Angeles, California was greatly affected; the retail lead-free regular grade gasoline prices rapidly increase by 6 cents per gallon 4 days after the spill (Herbst, Marshall and Wingender, 1996).

5. 2 Environmental Impacts

The oil spill had affected the environment and those living on it in Alaska, particularly the marine lives, such as sea otters, seals, sea lions, herring, krill and salmon (Alaska Fish & Game Magazine, 1989). Furthermore, the spill added insult to the injury because of the declining population of harbor seal. Only 2 out of 26 species that have been studied by Exxon Valdez Oil Spill Trustee Council have recovered – bald eagle and river otter (Exxon Valdez Oil

Spill Trustee Council). Thus, the disaster had killed more or less 10 times as many birds as any other US or European oil spill in history – with more than half a million birds died. Currently, chronic effects of the spill decreased the reproduction of birds. Furthermore, some fish died; however, the most critical damage was to their spawning and rearing habits. It is recorded that more than 100 salmon streams were oiled (U. S. Coast Guard, 1993).

In addition, the study of Alaska Oil Spill Commission (1990), in spite of the efforts of many government and non-government agencies, only 14% of the oil was removed during the cleanup operations. Thus it continues to contaminate beaches, national parks and the wilderness.

5.3 Social and Cultural Impact

The oil spill had destroyed the cultural foundation of Native life. It is important to take note that the subsistence cultures of the natives are based on personal relationship with the environment (Markey, n. d.). Before the spill, the natives depended on their observations and experience in order to know if an animal is safe to eat or not – if an animal looked ill, then it was not consumed by the people. However, after the oil spill, people had become aware of the safety of all resources, which include terrestrial mammals. In addition, there are some residents who reported that the berries that grow in the uplands have been affected by the fumes that are rising from the oil in the water and on the beaches (Miraglia, 2002).

In addition, the economic instability of the region, together with the destruction of the nature – which is considered as the main resources for living, conflict between domestic fishermen in Alaska, had increased.

6. 0 Changes and Improvements after the Crisis

6. 1 Exxon Mobil

After the oil spill disaster, which is considered by Exxon Mobil as the lowest points in the history of the company, significant operational changes were implemented via operational management in order to prevent the same incidents in the future (ExxonMobile. com, n. d.). Figure 3 shows the current operational management system being implemented by the company until now.

Figure 3 Operational Management System in Exxon

Source: (ExxonMobile. com, n. d.)

In addition, there were also different changes in the operations and procedures inside the organization, which include the: modification of tanker routes, implementation and monitoring of drug and alcohol testing programs for those position that are sensitive over safety; restriction of safety-sensitive positions to those employees with no history of abuse of any substance; implementation of more intensive evaluation of vessels and facilities of the ExxonMobil; improvement of training and development programs for vessel captains and pilots; and application of new technology in order to improve vessel navigation, at the same time, ensure the integrity of oil containment systems (ExxonMobile. com, n. d.).

Above all, the company also focuses on response to risk. Generally, ExxonMobil is a founding member of every major oil spill response center in the world; more than 1, 000 employees of the company are involved in the oil spill response teams in the world; frequent oil spills are being

<https://assignbuster.com/exxon-valdez-oil-spill-disaster/>

implemented in the world; and implementation of improved technology in detecting oil spill (ExxonMobile. com, n. d.).

6. 2 Government

Both Exxon and the government implemented changes in policies in order to prevent the same problems in the future. First, in response to the oil spill, the Oil Pollution Act of 1990 (OPA) was passed by the United States Congress. The said act prohibits those vessel (after 22 of March 1989) that caused oil spill of more than 1 million US gallons or equivalent to (3, 800m³) in any marine area, from operating in Prince William Sound (Federal Wildlife and Related Laws Handbook, 1990).

In addition, Steve Cowper, the governor of Alaska had issued an executive order which required two tugboats to escort every loaded tanker from Valdez out in the entire vicinity of Prince William Sound up to the Hinchinbrook Entrance.

7. 0 Conclusion

Industrial crisis or disaster is considered as one of the most devastating types of crises which greatly affect the lives of people, including the environment, economy, together with the social and cultural aspect of the society. With this, it is important for those industrial companies, particularly those safety-sensitive organizations, such as those in the petroleum industry to focus on its overall management system, which will help in order to prevent the risk and the threats of future disaster or crisis. In addition, it is also an important aspect of the overall corporate social responsibility of any

company, particularly today that the world is becoming more aware of the impact of global warming or climate change.

There is no doubt that the Exxon Valdez oil spill is considered as one of the most destructive disasters of all time, because it had caused damage to the entire environment and ecosystem in an area or region wherein people are very dependent on the nature for their living. As a result, it had affected, not just the economy of Alaska, but also the entire economy of the USA. This crisis could have been prevented if the company and the local and national government are focusing on the worst situation. For the government, it could have been prevented, if it is vigilant in monitoring the performance of each safety-sensitive company in the country, and if it has a better contingency plan. As for Exxon, the crisis could have been prevented if it had a better operational management system, which focuses on the quality of its machineries and equipments, its employees and its risk management process.