EASTERN UNIVERSITY, SRI LANKA

FACULTY OF COMMERCE AND MANAGEMENT

Final Year First Semester Examination in Bachelor of Business Administration

(Specialization in Human Resource Management) – 2012 / 2013

(FEBRUARY / MARCH 2015) (Proper)

HRM – 4033 EMPLOYEE HEALTH AND SAFETY

Answer all questions

Time: 03 Hours

Q1. **Nuclear Disaster in Japan**

Descriptions of Nuclear Disaster in Japan

The plant comprises six separate boiling water reactors originally designed by General Electric (GE), and maintained by the Tokyo Electric Power Company (TEPCO). At the time of the quake, Reactor 4 had been de-fuelled while 5 and 6 were in cold shut down for planned maintenance. The remaining reactors shut down automatically after the earthquake, and emergency generators came online to control electronics and coolant systems. The tsunami broke the reactors' connection to the power grid and also resulted in flooding of the rooms containing the emergency generators. Consequently those generators ceased working and the pumps that circulate coolant water in the reactor ceased to work, causing the reactors to begin to overheat. The flooding and earthquake damage hindered external assistance.

In the hours and days that followed, reactors 1, 2 and 3 experienced full meltdown. As workers struggled to cool and shut down the reactors, several hydrogen occurred. The government ordered that seawater be used to attempt to cool the reactors—this had the effect of ruining the reactors entirely. As the water levels in the fuel rods pools dropped, they began, to overheat. Fears of radioactivity releases led to a 20 km (12 mi)-radius evacuation around the plant. During the early days of the accident, workers were temporarily evacuated at various times for radiation safety reasons. Electrical power was slowly restored for some of the reactors, allowing for automated cooling.

Japanese officials initially assessed the accident as Level 4 on the International Nuclear Event Scale (INES) despite the views of other international agencies that it should be higher. The level was successively raised to 5 and eventually to 7, the maximum scale value.

The Japanese government estimates the total amount of radioactivity released into the

atmosphere were approximately one-tenth as much as was released during the Chernobyl. Significant amounts of radioactive material have also been released into ground and ocean waters. Measurements taken by the Japanese government 30–50 km from the plant showed radioactive caesium levels high enough to cause concern, leading the government to ban the sale of food grown in the area. Tokyo officials temporarily recommended that tap water should not be used to prepare food for infants.

A few of the plant's workers were severely injured or killed by the disaster conditions resulting from the earthquake. There were no immediate deaths due to direct radiation exposures, but at least six workers have exceeded lifetime legal limits for radiation and more than 300 have received significant radiation doses. Predicted future cancer deaths due to accumulated radiation exposures in the population living near Fukushima. Fear of ionizing radiation could have long-term psychological effects on a large portion of the population in the contaminated areas. On 16 December 2011 Japanese authorities declared the plant to be stable, although it would take decades to decontaminate the surrounding areas and to decommission the plant altogether.

Safety History

Changing the layout of the emergency-cooling system, without reporting it (1967)

On 27 February 2012 nuclear industry safety association (NISA) ordered TEPCO to report by 12 March 2012 about the reasoning to change the layout for the piping for an emergency cooling system from the plans originally registered in 1966 before the reactor was taken in operation. After the plant was hit by the tsunami, the isolation condenser should have taken over the function of the ordinary cooling pumps, by condensing the steam from the pressure vessel into water to be used for cooling the reactor. But the condenser did not function properly, and TEPCO could not confirm whether a valve was opened.

Falsification of safety records by TEPCO (1976)

The Fukushima Daiichi nuclear power complex was central to a falsified-records scandal that led to the departure of a number of senior executives of TEPCO. It also led to disclosures of previously unreported problems at the plant, although testimony by Dale Bridenbaugh, a lead GE designer, purports that General Electric was warned of

major design flaws in 1976, resulting in the resignations of several designers who protested GE's negligence. In 2002, TEPCO admitted it had falsified safety records at the No. 1 reactor at Fukushima Daiichi. As a result of the scandal and a fuel leak at Fukushima Daiichi, the company had to shut down all of its 17 nuclear reactors to take responsibility. A power board distributing electricity to a reactor's temperature control valves was not examined for 11 years. Inspections did not cover devices related to cooling systems, such as water pump motors and diesel generators.

The Japanese government opposes a court-order (2006)

In March 2006 the Japanese government opposed a court order to close a nuclear plant in the west part of the country over doubts about its ability to withstand an earthquake. Japan's Nuclear and Industrial Safety Agency believed it was "safe" and that "all safety analyses were appropriately conducted".

Tsunami-study ignored (2007)

In 2007 TEPCO did set up a department to supervise all its nuclear facilities, and until June 2011 its chairman was Masao Yoshida, the chief of the Fukushima Daiichi power plant. An in-house study in 2008 pointed out that there was an immediate need to improve the protection of the power station from flooding by seawater. This study mentioned the possibility of tsunami-waves up to 10.2 meters. Officials of the department at the company's headquarters insisted however that such a risk was unrealistic and did not take the prediction seriously.

Results of Governmental Investigations (2011)

On request of the Japan Broadcasting Corporation, on 2 October 2011 the Japanese Government released a report of TEPCO to NISA. These papers proved that TEPCO was well aware of the possibility that the plant could be hit by a tsunami with waves far higher than the 5.7 meters which the plant was designed to withstand. Simulations done in 2008, based on the destruction caused by the 1896-earthquake in this area, made it clear that waves between 8.4 and 10.2 meters could overflow the plant. Three years later, the report was sent to NISA, where it arrived on the 7 March 2011, just 4 days before the plant was hit by the tsunami. Further studies by scientists and an examination of the plant's tsunami resistance measures were not planned by TEPCO

before April 2011, and no further actions were planned to deal with this subject before October 2012.

TEPCO official Junichi Matsumoto said that the company did not feel the need to take prompt action on the estimates, which were still tentative calculations in the research stage. An official of NISA said that these results should have been made public by TEPCO, and that the firm should have taken measures right away.

Reasons for Failure to Protect Again Radiations Effect

Cascade of failures

Government agencies and TEPCO were thoroughly unprepared for the "cascading nuclear disaster" which was largely caused by a public myth of "absolute safety" that nuclear power proponents had nurtured over decades. The tsunami that "began the nuclear disaster could and should have been anticipated and that ambiguity about the roles of public and private institutions in such a crisis was a factor in the poor response at Fukushima".

In March 2012, Prime Minister Yoshihiko Noda said that the government shared the blame for the Fukushima disaster, saying that officials had been blinded by a false belief in the country's "technological infallibility", and were taken in by a "safety myth". Mr. Noda said "Everybody must share the pain of responsibility".

Poor communication and delays

The Japanese government has admitted it did not keep records of key meetings during the Fukushima nuclear crisis, even though such detailed notes are considered a key component of disaster management. Data from SPEEDI (System for Prediction of Environmental Emergency Dose Information) were sent by email to the government of the Fukushima prefecture, but not shared with others. All was revealed more than a year later, on 21 March 2012. The data were not used, because the disaster countermeasure office did regard the data "useless because the predicted amount of released radiation is unrealistic."

Regulation

Regulatory capture may have contributed to the cascade of failures which were revealed after the tsunami receded. Regulatory capture may have also contributed to the

current situation. Critics argue that the government shares blame with regulatory agency for not heeding warnings, for not ensuring the independence of the nuclear industry's oversight while encouraging the expansion of nuclear energy domestically and internationally.

World media have argued that the Japanese nuclear regulatory system tends to side with and promote the nuclear industry because senior regulators accept high paying jobs at the companies they once oversaw.

Questions:

a) Analyze reason for failure to protect again Radiations effect?

(06 Marks)

b) What are the effect of Radiation released into the atmosphere, to employees and people around to the nuclear power plant?

(06 Marks)

c) Briefly explain the reason caused to this Accident?

(06 Marks)

d) Critically analyze the safety history of Nuclear Power Plant of Japan?

(10 Marks)

(Total 28 Marks)

Q2. a) "Minimization of health and safety hazards and risks in the moral as well as the legal responsibility of employers" Define the Term Occupational Safety and Health with evidence from different authors or researchers?

(06 Marks)

b) Define the following terminology used in Occupational Safety and Health?

a. Hazard
b. Outcome
c. Risk

(06 Marks)

c) "Addressing safety and health issues in the workplace saves the employer money and adds value to the business." Do you agree or not? Why?

(06 Marks)

(Total 18 Marks)

Q3. a) Elaborate the objectives of "Safety Management"?

(04 Marks)

b) "The company must have a written safety policy" Clearly explain safety policy of an organization?

(06 Marks)

c) 'Work accidents are caused by a complex combination of unsafe employee behavior and unsafe working conditions". Discuss the reason for the complexity of safety and in which ways you can manage it?

(08 Marks)

(Total 18 Marks)

Q4. a) "The safety audit is the process that identifies unsafe conditions and unsafe acts in the plant and recommends safety improvement" Discuss the following safety audit?

a. Walk-through safety audit
b. Intermediate safety audit
c. Comprehensive safety audit

(06 Marks)

b) Analyze the first scientific approach to accident/prevention theory of Heinrich's Domino's Theory?

(06 Marks)

c) Explain occurrence of Electricity Shock and it's Severity with examples?

(06 Marks)

(Total 18 Marks)

Q5. a) Briefly discuss about Occupational Health Risks with examples?

(04 Marks)

b) "The safety orientation and training as per predetermined training programme should be effectively imparted to all employees" Discuss method of training for industrial employees?

(04 Marks)

c) Explain ISO 14000 and ISO 14001 regarding standards for Environmental Management?

(04 Marks)

d) Risk is "Uncertainty of Outcome" Discuss about Risk Management and Risk Analyze?

(06 Marks)

(Total 18 Marks)

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