Research methodology of human error factor essay examples

Business, Management

Introduction

Research into the human error factor at Macondo Oil well disaster can be reviewed from different aspects. Textual analysis will review existing records and test results at the company, that is, BP and Transocean, the owner of the Deepwater Horizon Drilling Rig. The research will further examine reports of commissions that were formed to look into the Gulf disaster. Several commissions and organizations took the effort to review the different causes of the disasters. In particular, the National Commission on the BP Deepwater Horizon oil disaster, commissioned by President Obama, produced a Chief Counsel's report which was the basis for most findings with regard to the disaster. The commission found several causes and conjoint events that led to the disaster. Still, the commission was adamant in maintaining that human error played a huge role leading to the disaster. The commission dedicates an entire chapter on the failure by the management to make concerted effort to reduce risks . The research methodology will first rely on data collection from secondary sources. Further, the research methodology will rely on analyzing available data that directly relate to incidents and events leading to the disaster. The research methodology will additionally develop assertions based on models and in particular the Swiss cheese model and the HumanHAZOP model. With regard to the Swiss cheese model, the research will be addressing the research question as to whether a human error alone is enough to cause a catastrophic failure or do all accidents occur due to human error. Similarly, HumanHAZOP will attempt to answer the research question as to whether deploying a HumanHAZOP systematic

approach to mitigating risks would have reduced the chances for the disaster to occur.

Data Collection

This study will be based on secondary data. The data that will be particularly important for this report will be collected from several sources. One of the main sources is the Report from the National Commission to investigate the disaster at the Macondo well. The other sources include reports to BP from the contractors such as Halliburton. These sources will used to indicate the operations on board the rig and will therefore entail reports, test results and procedures. Other sources include environmental reports, transcripts from congressional interviews, journal articles and books that address human factors leading up to the disaster.

Analytical tools and data types

In order to analyze the data collected, charts, tables and graphs will be used. The analytical charts will used to indicate the expected extent or industry practiceof the vis-à-vis the data collected. Such a chart will indicate the extent to which collected data deviated from expected industry practice. Moreover, both quantitative and qualitative data types will be used in the study. In particular, quantitative data types will used to identify the extent to which the firm or the managers may have deviated from expected industry practice. The main cause for gulf disaster was established to be a blow out in the well due to the failure by the cement to hold the under high pressure as well as weaker systems to set off alarm due to presence of hydrocarbon gases . Therefore, quantitative data will indicate the extent to which

expected industry practice were flouted by managers and thus the disasters truck. Such quantitative data will include test results, expected pressures levels, time taken for calibration and number of workers required to monitor gauges.

In the same regard, qualitative data will be collected to indicate other aspect of human errors. Here a tables, charts and graphs will used to indicate the nature and extent to which managers aboard the Deepwater Horizon deliberately overlooked procedures thus endangering the lives of the crew onboard. Such quantitative data will point to the incentives provided to the managers and the wrong decisions made due to time constraints. The research will also indicate the how managers were willing to work beyond industry standards in order to gain bonuses at year end.

Model Building

Swiss Cheese Model of Human Error

In analyzing the data with regard to the research questions, the study will attempt to make use of the data to develop two models used in defining human error factors. The first model that the study will seek to illustrate is the Swiss Cheese Model for human errors. This model will used to determine the first research questions, that is, are all accidents as a result of human errors. The Swiss cheese model is model that describes systems and functions based on the defenses and safeguards in place.

The model argues that each and every system is like slices of a Swiss cheese and that each layer (subsystem) has defenses such as automatic shutdown, alarms and other forms of barriers that prevent failures or accidents.

Similarly, every units, layer or division of a system has human components whose main role is to ensure that the system does not fail. Such human component include managers, safety managers and supervisors

However, while the system may have all these preventive mechanisms and measures, weaknesses will always exist. Corn (2010) argues that human errors and other forms of systemic failure will always be present and this can be likened to the holes on the slice of cheese. However, the Swiss cheese model maintains that the holes on systems are not as static as the one of the cheese. The holes (weak points) are continually shifting, forming or shutting. However, there are conditions where the weaknesses may align leading to a catastrophic failure.

However, for failure to occur, the Swiss cheese model of human errors maintains that two reasons will account for a catastrophic failure. These two reasons are active failures and latent conditions. An active failure is where an active event or procedure in the set down procedures is experienced thereby setting on course events leading to a disaster or exposing the system to a state of extreme susceptibility. This research, relying on the collected data, will indicate that active failures by the managers in terms of ignoring tests and other laid down procedures set forth events that would lead to the disaster. This will have answered the research question as to whether human error alone is the cause of all disasters. This section will attempt to asserts that human errors alone is not enough to cause a catastrophic failure of a system.

On other hand, a latent condition can be likened to the presence of ' pathogens' in biological terms that combine with the active failure lead to

the catastrophic event. This research will attempt to build this model by indicating that a combination of both human failure and presence of a latent condition (combustible gas) led to the disaster at Macondo oil well.

HumanHAZOP

The second model that the research will build on is the human HAZOP techniques of the evading disaster. This section will attempt to respond to the final research question, that is, could the accident that result in the Deepwater horizon Oil spill been prevented if the Macondo management had used the HumanHAZOP safety tool to mitigate the possible failures on the human side?

The HAZOP (Hazard and Operability) is a formal approach to the design and systematic operations in an entity in order to identify hazard and mitigate such hazards. HAZOP main role is to identify areas that pose potential problems and attempt provide a means individual elements can be handled to mitigate risks. The following flow chart indicates the steps used in performing HumanHAZOP analysis.

This research, based on the data collected and analyzed, will attempt to review areas where HumanHAZOP would have been employed to reduce chances of the accident occurring. The research will indicate that several acts and procedures aboard the Deepwater Horizon were not devoid of risks and that had HumanHAZOP been employed, chances are the risks would have been mitigated. In particular, the will illustrate the manner in which critical tests such as pressure tests would be communicated to the senior managers aboard the Deepwater Horizon.

Research methodology limitations

The research into human error at the Macondo disaster will only be limited to the available secondary data. The research will rely on data mainly from the National Commission's report, journal, Transcripts of interviews and books.

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