An Assessment on the Level of Compliance in the Handling and Disposal of Oil Contaminated Solid Wastes from Retail Fuel Service Stations in Gwarinpa District of Abuja

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Abstract- The research is aimed at ensuring a clean environment and protecting the environment from the activities of retail fuel service stations which requires proper monitoring and enforcement of environmental regulatory standards by regulatory bodies and adequate compliance by operators. The safety of humans and their environment is key in applying environmental best practice in any retail fuel service stations. The research sought to determine the level of compliance to environmental regulations among retail fuel service stations within Gwarinpa District of Abuja, Nigeria in the handling and disposal of oil contaminated solid wastes. Questionnaires, field observations of the facilities and interviews were used to collect relevant information from the respondents and regulatory agencies. The research conducted a census of all seven retail fuel service stations within the Gwarinpa District. The researcher employed both quantitative and qualitative techniques in analyzing the data which included content analysis and descriptive statistics. The data analyzed was used to draw inferences and conclusions for this research. The findings showed that majority of the retail fuel stations activities via respondents in the handling and disposal of oil contaminated solid waste did not comply with existing regulations stipulated by the Department of Petroleum Resources and National Oil Spill Detection and Response Agency.

Keywords- Oil Contaminated Solid Waste, Contamination, Compliance, Enforcement

I. INTRODUCTION

This work is a preliminary research of an on-going research in the handling and disposal of oil contaminated solid wastes generated from retail fuel service stations. Retail fuel service stations are the major facilities for dispensing petroleum products to the consumers for fuelling internal combustion engines. The petroleum products are usually dispensed from Underground Storage Tanks (USTs) through pumps and dispensers. Activities at the retail outlets include tank vehicle discharge of petroleum products, retailing of the products through pumps and dispensers, automobile service, car wash and super markets. Wastes generated from activities of the retail outlets include amongst others oil contaminated solid wastes such as empty oil cans, rags. The regulatory bodies saddled with the responsibility of ensuring compliance in the management and disposal of oil contaminated solid wastes and sent oils generated from retail fuel service stations are the Department of Petroleum Resources (DPR), National Oil Spill Detection and Response Agency (NOSDRA) and National Environmental Standards Regulatory and Enforcement Agency (NESREA). For the purpose of this research, regulations from DPR and NOSDRA which are the main regulations for handling and disposal of oil contaminated solid wastes and spent oils will be used to assess compliance. As one of its statutory functions, the department of petroleum resources is required to ensure that petroleum industry operators do not degrade the environment in the course of their operations while NOSDRA is required to restore and preserve our environment by ensuring best oil field, storage and transmission practices in exploration, production and use of oil in the quest to achieve sustainable development in Nigeria.

Retail fuel servicing stations pose contamination risks to the environment and its water resources through indiscriminate handling and disposal of oil contaminated solids generated from oily rags, empty oil cans, booms used to absorb spilled oil from tank vehicle discharge of petroleum products, spills from retailing of oil through pumps and dispensers. Indiscriminate dumping of oil contaminated solid wastes in public waste points without considering sorting or segregation may result in unexpected combustion when heat is introduced around it due to its highly flammable nature e.g., rags and booms used to clean up spill from fuel or spent oils. This unexpected incident may cause serious damage before it is contained. Indiscriminate disposal of these wastes on site may also lead to contamination by fuel and other hazardous substances. Contamination may present a risk to groundwater sources and to human health. Appropriate disposal of hazardous waste minimizes risks to human health and the environment. (Env. And Social Assessment for SMEs, 2005)

This research aims at evaluate the level of compliance of retail fuel service stations to environmental regulatory standards in the handling and disposal of oil contaminated solid wastes. The enquiry is limited to the following;

- Assessing level of regulatory awareness and training of retail outlet personnel in the handling and disposal of oil contaminated solid wastes.

- Examining the means of handling and disposal of oil contaminated solid wastes.

- Assessing level of enforcement activities of responsible regulatory bodies (DPR and NOSDRA).

The findings of this research would be valuable to policy makers and regulators as it would inform on the need to carry out regular monitoring and enforcement on oily waste management practices and necessity in enforcing compliance to best environmental practices. This would therefore inform future policy development and enforcement efforts to ensure full best practice compliance.

The main aim of the research was to get the level of compliance of retail fuel stations to environmental best practice. The research tries to identify likely determinants of the compliance and its effect on sustainable development via environmental sustainability. The research identified the dependent variable to be Environmental best practice compliance while the independent variables were identified as training and awareness of respondents and the enforcement strategies of relevant regulatory bodies such as the Department of Petroleum Resources (DPR) and National Oil Spill Detection and Response Agency (NOSDRA) through their Regulations; EGASPIN Part VII, Section B 4.3.1.6 and Acts; NOSDRA's ACT Part IX 146 respectively.

Sustainable development has been defined by Brundtland's Commission (1987) as a better quality of life for everyone, now and for generations to come. It offers a vision of progress that integrates immediate and longer-term needs, local and global needs, and regards social, economic and environmental needs as inseparable and interdependent components of human progress. Environmental sustainability refers to the long-term maintenance of valued environmental resources in an evolving human context. The best way to define and measure sustainability in the environmental viewpoint is to According to ESI (2005), some of the following indicators below are used to assess the environmental sustainability of a country:

- A country is more likely to be environmentally sustainable to the extent that its vital environmental systems are maintained at healthy levels, and to the extent to which levels are improving rather than deteriorating;

- A country is more likely to be environmentally sustainable if the levels of anthropogenic stress are low enough to engender no demonstrable harm to its Environmental systems;

- A country is more likely to be environmentally sustainable to the extent that people and social systems are not vulnerable to environmental disturbances that affect basic human wellbeing; becoming less vulnerable is a sign that a society is on a track to greater sustainability;

- A country is more likely to be environmentally sustainable to the extent that it has in place institutions and underlying

social patterns of skills, attitudes, and Networks that foster effective responses to environmental challenges;

II. OIL CONTAMINATED SOLID WASTE

Oil contaminated solid waste also known as ''oily wastes'' can be described as those materials which are mixed with used oil or contaminated by used oil. Some common examples of oil-contaminated wastes include: spent rags containing used oil, spill sorbents (E.G., Polypropylene pads, sawdust, corn cob grit, wood chips, and granular clay), and filter media from oil filters. Oil-contaminated wastes may contain hazardous contaminants such as toxic petroleum-based organic compounds and heavy metals, which, if not disposed properly, may pollute surface waters, ground waters, and kill vegetation and wildlife. It is expected that generators must store used oil-contaminated waste materials in covered, leak-proof containers labeled "oil contaminated waste" and must ensure that no free liquids are present. (Industrial solid waste fact sheet, 2013)

A. Effects of Indiscriminate Disposal of Oil Contaminated Solid Wastes

Indiscriminate handling and disposal of oil contaminated solid wastes from oily rags, empty oil cans, booms used to absorb spilled oil from tank vehicle discharge of petroleum products and spills from retailing of oil through pumps and dispensers may pollute surface waters, kill vegetation and wildlife. Indiscriminate dumping of oil contaminated solid wastes in public waste points without considering sorting may result in unexpected combustion when heat is introduced around it due to its ignitable couple.

B. Regulations on Oil Contaminated Solid Waste

Refuse containers shall be provided for the recovery of oily rags, empty oil cans, etc. and disposed in accordance with public health and sanitation procedures, satisfactory to the Director of Petroleum Resources (DPR, 2002). Oil contaminated solid wastes, sludges, storm water, surface drainage and treated waste waters shall be appropriately stored and transported to a properly constructed integral depot facility for treatment using the best available technology to prevent the risk of oil spill and negative impact on the environment before disposal (NOSDRA, 2006)

III. METHODOLOGY

This research relied data obtained from two main sources namely secondary and primary sources. Field investigation, questionnaire survey and face-to-face interview were employed to gather data, data was also obtained from books, articles and internet sources. The compliance acts and regulations used in this research included the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN) from the Department of Petroleum Resources (DPR) and the NOSDRA's ACT from the National Oil Spill Detection and Response Agency (NOSDRA). Seven retail fuel service stations were assessed in the research of which five were conglomerates and two independent private marketers. Two respondents were selected for questioning from each retail

station comprising: Managers/Supervisors and Pump Attendants, based on their individual designations and work sections pertinent to the research. The research sought to find the level of compliance in environmental practices of various respondents through the use of questionnaires. These questions were designed peculiarly for each of the respondents in relation to their duties. The research did not have a sample size since the research conducted a census. Hence the researcher collected data on all the retail fuel service stations within the Gwarinpa District due to the limited number of fuel stations. The research conducted a census survey since all members of the population were included in the research. The Gwarinpa District was selected as sample area because it contains information relevant for the research.

IV. RESULTS/DATA ANALYSIS

A. Managers

- 42.87% of respondents in this section were managers while 57.16% of respondents were supervisors.

- 100% of respondents fall between the ages of 25-40.

- 100% of the respondents were male.

- 71.45% of respondents had tertiary education while 28.58% had secondary school education.

- 28.58% respondents had between 1-5 years work experience, 42.87% had 6 -10 years work experience, while 28.58% had 11-15 years work experience.
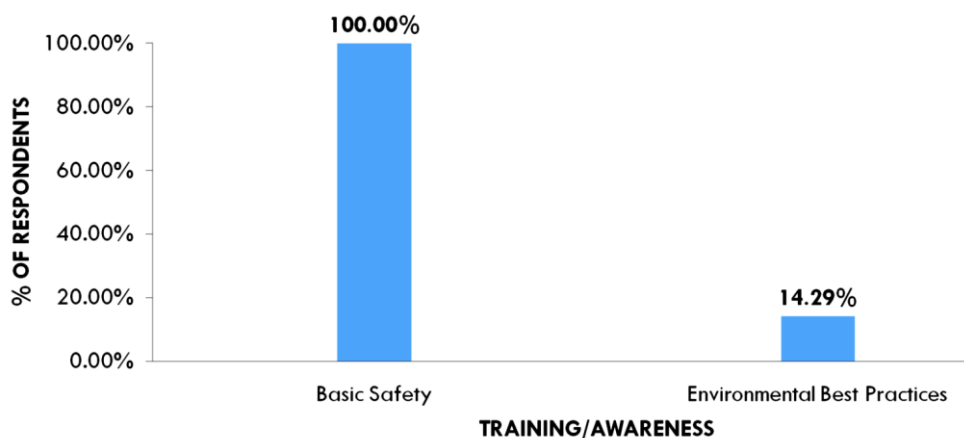

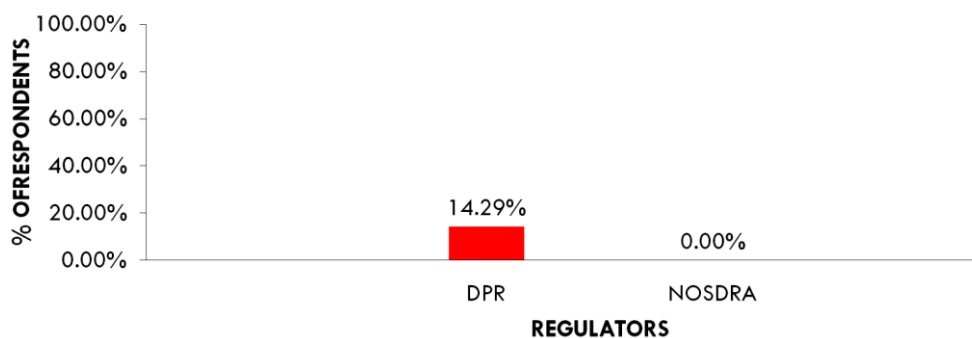Figure 1.   % of respondents awareness/training

Figure 2.   % of respondents comments on the level of monitoring and enforcement of regulatory bodies (NOSDRA & DPR) on environmental best practices

B. Pump Station

- All respondents fall between the ages of 22 – 32,

- 85.74% of respondents were male and 14.29% female.

- 85.74% had education up to secondary school while 14.29% had up to tertiary level.

- 100% of respondents had work experience between1-5 years.

- 100% agreed that spills occurred but rarely during tank (UST) vehicle discharge and pump dispensing.
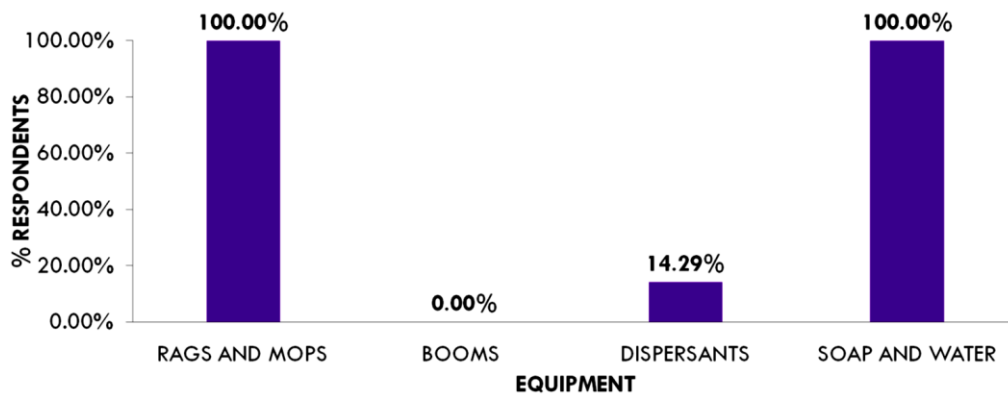
Figure 3.   % of respondents awareness

Figure 4.   % of respondents compliance to availability of oil spill combating and cleaning equipment

V.   CONCLUSION

The findings show that majority of the retail fuel stations activities in the handling and disposal of oil contaminated solid waste did not absolutely comply with existing regulations stipulated by the DPR and NOSDRA. The findings further indicate that the reasons for lack of compliance of retail fuel stations are due to the lack of proper training and awareness of respondents in the handling and disposal of oil contaminated solid wastes and also due to ineffective environmental law enforcement strategy where most of the strategies and mechanisms are poor and not being implemented. During this research, it was noted that the sample size used was small and may therefore need to be expanded beyond the Gwarinpa district so as to have a more holistic approach to the research.

VI.   RECOMMENDATIONS

Retail fuel service stations need to allocate and avail more finances to invest in the training and creating of awareness for staff on environmental best practices and ensure that environmental activities are given top priority and concern rather than be propelled by relevant regulatory agencies to adhere compliance. Oil contaminated solid wastes such as waste containers of oil, rags, booms, mops etc that are generated from fuel station activities should be collected and segregated from general waste for proper disposal while Sand used to absorb fuel spills should be spread out letting fuel to evaporate before disposal into waste skips. There is also the need for regulatory bodies to improve on enforcement strategies and mechanisms so as to ensure effectiveness in implementation and compliance with environmental best practices by retail fuel service stations.

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