

Environment Audit On Tyre Industry: A Case Study Of Bridgestone Pvt. Ltd Pithampur, Indore

Suyash Kimtee , Er.Abhineet Nighojkar

M.tech (Environmental Engineer)Civil Engineering and Applied Mechanics Department S.G.S.I.T.S. Indore, (M.P.)

Assistant Professor, Civil Engineering and Applied Mechanics Department S.G.S.I.T.S. Indore, (M.P.)

Abstract-The paper reviews the initial attempts being made in India to commence the practice of environmental audit. Environmental audit is a effective management tool to provide information on practices which differ to the current procedures and to exercise effective management of the established system. The paper takes a quick look at how the discipline of audit can be viewed as management tool to improve system safety, to optimize cost and to enhance operational reliability. Rapid Industrialization leads to more exploitation of natural resources. Air and Water emission in environment has created alarming situation for all the concerned. The nature which, benefited the mankind in all respect, is destroyed by him for his personal gain. Now the consciousness at national level is increasing day by day with focus on environment and sustainable development. So an appropriate management technique is needed for the performance of environment management program. "ENVIRONMENTAL AUDIT" is an exercise which integrates industry and environment. This helps in evaluating how well environmental organization, management; equipments are performing and to regulate the environment by facilitating management, control of environment practice. In India it was made compulsory to submit environmental audit report year wide Gazette Notification dated 13th March 1992. This rule has been named under Environment Protection Act.

Keywords- Environmental audit, Environmental management, Pollution, Tyre industry. Bridgestone. Health & safety, Sustainable development.

1. INTRODUCTION

Environmental Auditing is a natural culmination of a series of happenings on environmental front all over the world. A large number of environmental laws and regulations are now available in every country and the industry should know that its operating practices are in agreement with environmental regulations. Environmental audit is also essential to keep management fully abreast on environmental issues so also to avoid any mishap, litigation and liability.¹⁰ Environmental Audit investigates all possibilities of energy savings, material, improvement in occupational health and safety of industrial workers. It also helps in communicating the results of this process to the concerned management and suggests corrective steps to be followed at the early stage.¹

A good environment management policy requires that there should be constant efforts to analyze and monitor various

Regulatory agencies considered such auditing has an important management technique because it ensures compliance with the environmental requirements and related corporate policies.⁴ The industry has to incur a significant cause to reduce these very high influent concentrations of pollutants to the Minimum National Standards (MINAS) of 35 mg/l of BOD, 250 mg/l of COD and 100 mg/l for SS in India.⁷ The environmental challenges for the tyre industry is associated with liquid waste, gaseous waste, solid waste and noise pollution.⁹ Therefore conducting environmental audit prove to be effective risk management tool for assessing compliance with environmental legislation, thereby assisting industries to avoid the risk of the prosecution and fines arising from potential environmental breaches. It is perceived to benefit both the industry and environment.⁴

1.2 Bridgestone, Pithampur

Bridgestone, in a short stint of 10yrs in India has grown to tremendous heights. It has become one of the major suppliers to almost all the reputed car manufacturing companies in India. Quality has always been a premium at Bridgestone and the strict standards followed, are certified by the world's leading authority in quality certifications.

In the past decade India has seen a tremendous growth in the automobile segment. Bridgestone has been able to spearhead its contribution in this booming passenger car market and has become one of the preferred OEM (original equipment manufacturing) suppliers to major car manufactures in India. With a vast network of more than 1000 dealers spread across India efforts are being constantly taken to increase this penetration level and make the quality tires available even in the remotest corner of the country. Constant up graduations at

Suyash Kimtee is currently pursuing masters degree program in Environmental engineering in in Civil Engineering and Applied Mechanics Department S.G.S.I.T.S. Indore, (M.P.).

E-mail:suyashkimtee@gmail.com

Er. Abhineet Nighojkar is Assistant Professor in Civil Engineering and Applied Mechanics Department S.G.S.I.T.S. Indore, (M.P.)E-mail:abhineet.nighojkar@gmail.com

industrial working system and processes to generate and transmit this information for the inspecting authority.³

the production level all being undertaken to satisfy the ever-increasing demand of this exiting Indian car market. The right marketing programs are also being initiated to increase the brand presence all across the century with all this efforts, Bridgestone. India will emerge and contribute in fulfilling the vision of its parent company of being truly global player and be the "WORLD'S NO.1" tyre and rubber manufacturing company. Bridgestone India Pvt.ltd was formed when the \$18 billion global tyre giant Bridgestone and Rs.2527.26 crore (\$601.7 million) ACC of India decided to join hands for manufacturing radial tyres in India. This Rs 345 crores joint venture is poised for bringing a revolution in the radial tyre segment of the Indian tyre industry, as Bridgestone is the world leader in radial technology.¹⁰

1.3 Environmental Audit

The emergence of the concept of "SUSTAINABLE DEVELOPMENT" in recent years warrants the implementations of preventive environmental management measures like Environmental audit(EA) which is an instrument for resource conserving made in an industry sector.

EA may be defined as a pragmatic management tool comprising a systematic, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of helping to regulate the environment by:

- a) Facilitating management control of environment practices.
- b) Assessing compliances with industry policies, which would include meeting regulator requirements.⁹

Recognizing the importance of Environmental Audit, procedure for Environmental Audit was first notified under the Environment (protection) Rules 1986, by the Ministry of Environment and Forests (vide their nullification No. GSR 329 (E) dated 13th March 1992).

Environmental statement has to be submitted by every person carrying an industry, operation or process requiring consent under section 25 of the water (Prevention and Control of Pollution) Act 1974 or under section 21 of the Air (prevention and Control of Pollution) Act of 1981 or both or authorization under the Hazardous waste (Management and Handling) Rules of 1989 issued under the Environment (Protection) Act of 1986. The statement has to be submitted to the concerned State Pollution Control Board for the period ending on 31st March is a prescribed format by 30 September 1993. The prescribed Performa has nine parts (A to I) and covers the items like water and raw material consumption, pollution discharged to environment per unit of output of the parameters specified in the consent, Hazardous wastes from the pollution control facilities, solid wastes from the pollution control facilities, impact of pollution abatement measures on conservation of natural resources and on cost of production.⁸

1.4 Common Environmental Audits

There are many different types of environmental audit that may be carried out on an individual facility, operation or site. It is very important when commissioning an environmental audit of a mining operation or site to ensure that the objectives of that audit are clearly defined. This clear definition of objectives will determine the protocol to be used by the auditors, the qualifications needed by the auditor, or the audit team, and whether or not legal input should be included in the environmental auditing process. Following are the types of environmental audit.

- a. Environmental Management Audits
 - iv. Environmental Management Program Audits for companies with no formalized Environment Management System.
 - v. Environmental Management Systems Audits for those companies with a formalized Environmental Management System.
- b. Three levels:
 - i. First Party Audit - internal (by organization)
 - ii. Second Party Audit - usually by a customer on a supplier
 - iii. Third Party Audit - independently against the appropriate standard
- c. Compliance Audits - usually against environmental legislation, regulations, licenses, approvals and internal policies.
- d. Audits for Mergers, Acquisitions and Divestments - usually by banks and other financial lending institutions or by vendors and purchasers to assess environmental liability.
- e. Environmental Impairment Liability Audits - a prerequisite to Environmental Impairment Liability (EIL) insurance.
- f. Environmental Marketing Audits - usually a cradle-to-grave analysis of a company's products and operations to assess the environmental standing.
- g. Environmental Impact Audits - to assess monitoring of Environmental Impact Statement commitments or concerns during operations.
- h. Environmental Performance Audit - assesses environmental performance of ongoing activity
- i. Phase One Audit - assesses environmental liability related to acquisition or divestment of an asset.
- j. Technical Audits - assess the environmental impact of a specific part of an operation or a process.

Technical audits may be undertaken by industry or government agencies to assess whether a particular operation is having a detrimental effect on the environment, or to assess the environmental impact of a specific part of an operation or process (e.g., a coal preparation plant or a minerals concentrate or fuel consumption). Technical audits fall into a category of statutory environmental audits required to be undertaken by the Environment Protection Authority. Results of statutory environmental audits are made public.⁵



Fig.1 Google image of Bridgestone India Pvt. Ltd, Pithampur Indore

2. PROJECT SETTING

The main raw materials of a tyre are natural rubber, synthetic rubber, carbon black and oil. Share of rubber compounds in the total weight of a tyre is more than 80-85%. The rest consists of various kinds of reinforcing. The most important of these is carbon black which makes the tyre black in colour. Important filler is oil which is used as a plasticizer in the compound. Various chemicals and protective agents are used for hardening.

2.1 Mixing : In this type of mixing stage, the raw materials are mixed and heated at a temperature of approximately 120 degree Celsius. The consistency of rubber compounds used in different parts of a tyre varies depending on the intended use and model of the tyre. Also, adjusting is an important part of the tyre development work.

2.2 Component Manufacturing: The compounds which are used in rubberizing various components, such as nylon cord, steel cord, spools and packing materials. A tyre is manufactured from 10-30 different components. Most of the components are used and then are sold to authorized recycler.

2.3 Assembly: Tyre makers assemble the components into green tyres using assembly machinery in the building section. When the components have been drawn onto the belt drum of an assembly machine and the frame of a tyre has been set on the bulkheads of the stretching machine, the machine's loading wheel transfers the unity formed by the surface and a belt onto the frame. The frame is then stretched to fuse. This is how a green tyre is manufactured.

2.4 Vulcanizing: Green tyres are vulcanized in curing presses. The high steam pressure conducted into the curing pad inside the curing press presses and are converted into proper shape, giving the tyre its final appearance.

2.5 Inspection: Each tyre is inspected both visually and by a machine. Attention is paid to any faults and defects with the appearance of the tyre in the visual inspection along with the Quality assurance. When a tyre has been inspected, it will be tested, labeled and transferred to the warehouse for delivery. Inspection is done in the three formats.

3. STUDY AREA

Bridgestone Pvt. Ltd. India at Pithampur is situated at plot no.12, kheda growth center post Sagore 454774 dist. Dhar, M.P, India. Basically it is a plain area and the climatic conditions are favorable throughout the year. The industry has approximately 77 acres of land area.

4. AUDIT APPROACH

The typical audit comprises of three steps as Pre Audit, onsite Audit and Post Audit.

4.1 Pre Audit: The Pre Audit is conducted to get the background information. It is useful to get familiar with the company and to save time requirement for the onsite audit.

4.2 Onsite Audit: The onsite audit means to identify the water usage, raw water consumption, by product produced, wastewater produced, solid waste, hazardous waste generated and also analysis report is produced for all this waste as well as air, noise and sound. The water used for all the purpose within the industry is also taken into account.

4.3 Post Audit: The final draft is prepared for raw material, water consumption.

5. CONCLUSION

The tyre industry of Bridgestone, Pithampur near District Dhar is one of the good factories as it has its own units in its own premises for production of tyre. Even though the factory is taking care to avoid pollution, some of the points like good drainage facility and general cleanliness of the area is looked after.

The factory has planted around 1000 tree sampling in the premises indicates its concern towards environment. The Environmental Audit conducted at Bridgestone, Pithampur will be effective to reduce consumption of water. It saves the power and improved protection for sustainable operations.

Additional Measures for environment protection initiated by tyre factory with the effluent treatment

ACKNOWLEDGMENT

The sincere feeling of gratitude is expressed to Abhineet Nighojkar, Assistant Professor CE-AMD, SGSITS, Indore, for his kind guidance, continued interest and encouragement in the progress of the work in all places.

I would like to take this opportunity to express my sincere gratitude to Mr. Aditya Shukla, Health & Safety department Bridge stone India Pvt. Ltd.

plant are good indicators of environment management. Thus, Environmental Audit plays an important role to have a check on pollution control. Further studies on Environmental Audit with reference to various types of industries are needed in order to study various process, activities and their positive or negative impact on the environment

REFERENCES

1. Chaudhury P., "Environmental Auditing with Reference to a Bearing Industry", Int. Journal of Env. Protection. Vol 22(1), pp 400-404, 2002.
2. Khan A. and Sihorwala T.A., "Water Auditing of Solvent Extraction Plant". (M.Tech-Thesis SGSITS Indore), 1999.
3. Mehta R.M and Sharma V.K., "Environmental Audit - An Overview". Int. Journal of Env. Protection. Vol 17 (1), pp 212-214, 2002.
4. Meikandaan T.P and Thansekaran K., "Waste Audit of Electroplating Industries", Int. Journal of Env. Protection. Vol 26 (1), pp 640-643, 2006.
5. Hiwase P. D., Raman, N. S. and Hajare. H. V. "The Role of Technical Audit in Environmental Impact Assessment". Int. Journal of Innovative Res. In Sc., Engg. And technology. Vol(2), Issue 3, 2013
6. Murty M.N and Surrender Kumar., "Environmental Regulation and Industrial Efficiency". 197-198. 2004.
7. Rao T.B., Chonde S.G., Bhosale P.R., Jadhav A.S. and Raut P.D., "Environmental Audit of Sugar Factory : A Case Study of Kumbhi Kasari Sugar Factory, Kuditre, Kolhapur". Vol 1, pp 51-57, 2011.
8. R.K . Trivedy ., "Handbook of Environmental Laws Acts , Rules, Guidelines , Compliances and Standards". Vol 2, 1996.
9. Solomon S.K., Environmental pollution and its management in sugar industry in India: An Appraisal, Lucknow Christian College, lucknow, India. Sugar tech., 7(1), pp77-81, 2005
10. <http://www.bridgestone.com/corporate/history/index.html>.