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Current Issue: Environment Management Systems in Pollution Control

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From Director's Desk

Environment is a very dynamic system that changes with the fluctuations in surrounding factors and processes. The factors viz. temperature; humidity etc. directly controls the processes in natural or industrial ecosystems. Apart from factors, the processes in environment are positively or negatively influenced by the poor maintenance of the system and pollution. The industrial ecosystems can be planned, controlled and maintained for long time with planning and management. The Environmental Management System (EMS) play very crucial role in the management of environmental performance of any organization in comprehensive and planned manner with proper documentation. It acts on the principle of Plan- Do- Check – Act, which systematically supports environment management and pollution control of an organization. The natural ecosystems have a capacity of self-replenishment but it is getting affected due to increasing pollution, poor preventive measures and maintenance. Application of EMS in natural ecosystems like lake or a reserved forest can be very effective in checking the health of the ecosystem and maintaining it in long run.

We are very happy to release current issue of our institute's newsletter on the theme 'Environment Management Systems in Pollution Control'. It focuses on the environment management and pollution control in natural as well as industrial ecosystems. Our institute is actively involved in developing leaders in environment management systems through academic and training programmes.

Wishing you a happy reading of current issue.

Dr. Seema Mishra

Potential of Application of Environmental Management Systems in Natural Ecosystems

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Biodiversity is vital to social and economic development of any country and is indeed fundamental to human survival. Sustainable management of natural ecosystems and biodiversity is prerequisite to address the issues of conservation and loss. The United Nations has took strong step in this regard by declaring 2011- 2020 as a decade of Aichi Biodiversity targets for the biodiversity conservation, restoration, valuation and management. Further, UNs Sustainable Development Goals, 2015 also emphasized on above through goals 14th and 15th by focusing on conservation of biodiversity below water and on land, respectively.

India has developed its Strategic Plan, a ten year framework to achieve Aichi Biodiversity targets in 2012. The ecological or ecosystem diversity of the country is enormous, ranging from sea level to the highest mountainous ranges in the world; hot and arid conditions in the northwest to cold arid conditions in the trans-Himalayan region; tropical wet evergreen forests in Northeast India and the Western Ghats; mangroves of Sundarbans and fresh water aquatic to marine ecosystems. India has 12 biogeographical provinces, 5 biomes and 3 bioregion domains (Cox & Moore, 1993). The country supports a diverse array of habitats or ecosystems such as forests, grasslands, wetlands, coastal, marine and desert and each with rich and unique floristic diversity. These biological attributes are further enhanced by the geographic location of the country at the confluence of three major global biogeographic realms, viz. Indomalesian, Eurasian and Afro-tropical, thus allowing the intermingling of floristic elements from these regions as well and making it one of the 17 megadiversity countries in the world, recognised by the World Conservation Monitoring Centre in 2000.

In last decade decrease in biodiversity was observed in India mainly due to increase in pollution, climate change and unsustainable development. At this juncture a well-planned, systematic, comprehensive system is required for the conservation and management of natural ecosystems and biodiversity. The implementation of Environmental Management Systems (EMS) for the protection and conservation in natural ecosystem and biodiversity may be an ideal strategy. In several European countries the EMS has supported the strategy of conservation of biodiversity in protected areas and nature parks.

Implementation of EMS in the Conservation of Natural Ecosystems

i. EMS Approach in Environment Management

The Environment Management Systems is the structured system designed to support the organizations to manage their environmental impacts and improve their environmental performance caused by their products, services and activities. An environmental management system provides structure to environmental management and covers areas such as training, record management, inspections, objectives and policies. Implementation of an environmental management system requires the following steps to be completed by an organisation:

- Development of an environmental policy that reflects its commitments; Appointment of a person(s) responsible for its coordination;
- Identification of how the organisation interacts with the environment;
- Identification of actual and potential environmental impacts;
- Identification of relevant legal and other requirements;
- Establishment of environmental objectives, targets and programs;
- Monitoring and measurement of the progress to achieve its objectives;
- Reviewing the system and environmental performance; and
- Continuous improvement of the organisation's environmental performance.

ii. Process for the implementation of EMS in the Conservation of Natural Ecosystems

The steps involved in the process of implementation of EMS in natural ecosystem are given as below:

i. Formulation of environmental policy.
ii. Identification of environmental aspects.
iii. Identification of regulatory framework
iv. Finalization of objectives, targets and environmental programmes.
v. Structures and functions identification.
vi. Training, awareness generation and competence
vii. Communication
viii. Document control
ix. Operational control
x. Emergency preparedness and response.
xi. Monitoring and measurements
xii. Non conformance, corrective and preventive actions.
xiii. Record maintenance
xiv. Environmental auditing
xv. Management review

iii. Benefits of EMS in Natural Ecosystems

In natural ecosystem EMS improves the performance of the system by supporting continous improvement process by systematic planning and management. Implementation of an environmental management system requires the following steps to be completed by an organisation:

- Improvement in environmental performance by reducing consumption of energy and resources.
- Development of environmental policy as per the regulatory framework.
- Inventorization and monitoring of ecosystem services including biodiversity.
- Development of environmental framework for continuous improvement and monitoring.
- Improvement in ecosystem's image.

Challenges in the Implementation of EMS in Natural Ecosystems

The major challenges in the implementation of EMS will be in natural ecosystems with broad territories. The major challenges will

be in getting experts in EMS with broad knowledge of ecosystem and biodiversity.

Conclusion

The development of EMS for natural ecosystems in accordance with ISO 14001 will be useful in improving the overall performance of the system and its conservation. A comprehensive system with clear-cut guidelines and goals will be very useful in the inventorization and protection of ecosystems and biodiversity. The publication of environmental statement provides transparency to the activities and will improve the functioning and coordination of different stakeholders. The continuous monitoring of environmental performances for efficiency and efficacy will support the conservation process in long run. Furthermore, it will be having positive impact on social and economical aspects that will support the aspects of sustainable development.

Fire and Foaming in Lakes of Bengaluru: Causes and Remedial Measures

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Algal bloom or foaming is a consequence of nutrient enrichment (N and P) due to untreated sewage (mostly from human and household waste and detergents) and industrial effluents[1-4]. The phosphorus from several sources reaching water bodies causes pollution leading to algal blooms, frothing, etc. Phosphorus represents both a scarce non-renewable resource and a pollutant for living systems.

Primary nutrient, such as carbon, nitrogen, phosphorus, etc. contribute to eutrophication. Infresh water ecosystem, primary producers are able to obtain Nfrom the atmosphere and hence phosphorus is the primary agent of eutrophication. Moreover, elements carbon, nitrogen and phosphorus can generate its weight by 12, 71 and 500 times, and hence phosphorous is the limiting element in primary producers[1].Nutrients enrichment often leads to profuse growth of invasive species (water hyacinth, etc.), which forms thick mat hindering the sunlight penetration. In absence of sunlight, photosynthetic activities cease affecting the food chain. Absence of sunlight penetration leads to the decline of primary producers (algae) in the region below the macrophyte mat. Most part of nitrogen available in the sewage and industrial effluents is assimilated by producers, while phosphorous gets trapped in the sediment. During pre-monsoon with high intensity winds, churning of lake water happens, leading to the release of phosphorous from sediments forming froth.

Foaming is the manifestation of interactions among air bubble, surfactant and hydrophobic particles.

The hydrophobic particles congregate at the air-water interface and strengthen the water film between air bubbles. Meanwhile, the particles also serve as collector for surfactant which stabilizes the foam. Surfactants contain slowly biodegradable surfactants and hydrophobic particles are the filamentous bacteria with a long-chain structure and hydrophobic surface. Thus, frothing is due to the presence of slowly biodegradable surfactants (eg. household detergents) from industrial or municipal wastewater, excess production of extracellular polymeric substance (by microorganisms, proliferation of filamentous organisms) and air bubble (wind).The surfactant nonylphenolethoxylate (**NPE)**, an endocrine disruptor and estrogen mimic; phosphates, which help remove minerals and food bits but cause harmful algal blooms in waterway.

Chemical analyses of field samples (Table 1) reveal that, foams are enriched with particulate organic and inorganic compounds such as nutrients (Nitrogen, Phosphorus and Carbon), cations (Sodium, Potassium, Calcium and Magnesium). Foam generated is normally sticky and white in color. Most surfactants originate from the detergents, oil and grease that are used in households or industry.

Surfactant could stabilize the foaming and allow foam to accumulate.

Figure 1: Collection of water and foam samples from Varthur South (V1) and North (V2) outlets

Phosphorus (P) is one of the nutrients essential to sustain biota on the Earth and is a non-renewableresource[1]. The indiscriminate exploitation and abuse of this resource is threatening the sustenance and its availability for future generations is becoming obscure. There has been a series of events (frequent frothing, etc. in water bodies) and subsequent research have clearly highlighted the linkages of enhanced usage and influx of P with a phenomenal increase in P enrichment in surface and ground waters. Consequence of extensive phosphorus usage in contemporary urban societies is the nutrient enrichment or eutrophication of water bodies. Studies across the globe highlight of nearly 2.4–2.7-fold increase in nitrogen and phosphorus driven eutrophication of freshwater and marine ecosystems with the current level of human-induced stresses. The main sources of phosphate in aquatic environment, is through household sewage water containing detergents and cleaning preparations, agricultural run-off containing fertilizers, as well as, industrial effluents from fertilizer, detergent and soap industries[1].

Theconsumption of synthetic detergents is rapidly increasing with urbanization and most of them contain phosphate as a 'builder', which has been increasing phosphate loading in water bodies. Theestimated annual consumption of phosphate-containing laundry detergents for

the current population in India is about 2.88 million tonnes and the total outflow of Pis estimated to be 146 thousand tonnes per year. The environmental consequences necessitate immediate policy interventions for checking eutrophication of water bodies, through reduction in Phosphate based detergents and hence P inputs to surface waters.All the detergent manufacturers need to adhere to minimise the use of P in the manufacture of detergents while the authorities need to restrict with stringent norms. Strict control with the vigilant and environmentally conscious public only could ensure that Indian water bodies remain safe and healthy.During seventies and early eighties, 19th century such instances had brought about an increase in global consensus and the public awareness mostly in the European nations and triggered regulations on P loads from Industry and Urban sources. In India there has been a widespread use of P based detergents that has resulted in contamination of ground and surface waters rendering the water unsuitable for any use. One of the major constituents that form a bulk of the detergents is the builder material that is often made up of Sodium tripolyphosphate (STPP) that significantly contributes to P enrichment. The levels of P enrichment in urban water systems is enormous ranging from 0.5 to >10 mg/l of labile P. Abundant P in these systems have substantially contributed to increased biomass productivity and a leap in the net primary productivity of the urban aquatic systems that has resulted in rampant proliferation of aquatic macrophytes and weeds at the same time aided in the large scale algal blooms often seen sin the surfaces of these urban water bodies. The sludge P values in the initial reaches of the wastewater fed water bodies like Bellandur is ~1-3 %. During shifts in redox environments these P becomes bioavailable and results in increased primary productivity of the system. The sediment P levels varies from 0.1 – 0.28 %, mostly as NaOH soluble P forms indicating high fraction of mineralisable P in these lake systems. Two main solutions for cutting short rapid and high P influx into the system is a) Introduction of non-P based builders in detergents for example Zeolite, that can completely replace Sodium tripolyphosphates (STPP - amounts to ~50% bio-available P in municipal wastewaters) commonly seen in detergents and b) Augmenting the existing wastewater treatment system for nutrient removal and recovery. This requires various measures that aids in framing and implementation of laws to completely replace P based builders to alternative non-P based household laundry detergents. Already the European Commission (EC) has implemented non-P based culture in detergents through the European Union (EU) and recommends appropriate measures to improve the present P enrichment scenario. The two main essential P sources in urban conglomerates are the municipal wastewaters and to a lesser extent agriculture. In most of the Bangalore's catchment that has an inadequate treatment facility and treatment is mostly upto tertiary levels. Municipal wastewaters represent the single largest P source in urban municipalities. In case of certain areas where people practice agriculture, horticulture and floriculture, a minute amount of P (synthetic fertilisers) escapes from these landscapes, where top soil erosion and land run off are the crucial means of entry of fertiliser P into the channels and freshwater lakes. It has been estimated that P from detergents contributes to an estimated 65% of P in municipal wastewaters and the rest are from excrements etc. Based on the field sample analyses, the recommendations are a) A ban on production of polyphosphate based detergents in Indian systems which will help in usage of trusted non-P based detergents, that would bring down the P loads contributed from detergents in municipal wastewaters and also significantly reduce P loads from all garment, textile and other industries that uses detergents substantially; b) Nutrient removal and recovery mechanisms to be augmented into the existing treatment systems by the help of phyto-phyco modules.

Table 1: Physico-chemical parameters of water and foam samples from Varthur lake

Parameters	V1	V2	Foam
Water temperature (^{0}C)	27.1	26.9	27.2
TDS (mg/l)	448	454	7000
EC (µS)	749	764	17000
pH	7.46	7.35	6.98
DO (mg/l)	2.6	0	-
BOD (mg/l)	24.39	60.98	650.41
COD (mg/l)	40	88	1140
Alkalinity (mg/l)	336	336	12000
Chloride (mg/l)	117.86	122.12	3195
Total Hardness (mg/l)	206	224	13000
Ca Hardness (mg/l)	57.72	64.13	3607.2
Mg Hardness (mg/l)	36.03	38.85	2282.45
Phosphate (mg/l)	1.263	0.881	74.59
Nitrate (mg/l)	0.541	0.361	129.72
Sodium	169.5	161	770
Potassium	35	34	230

The study highlights the need for immediate intervention towards the reduction in the amount of sodium tripolyphosphate (STPP) used in detergent builders and switch to 'alternative' non-phosphate based builders, such as Zeolite A; and, improving wastewater treatment taking advantage of constructed wetlands in urban wastewater treatment.

Fire associated with foam:

Flammability is the ability of a substance to burn or ignite, causing fire or combustion. Incidences of foam catching fire are due to compounds with high flammability i.e. (i) mostly hydrocarbons and organic polymers from nearby industries in the vicinity of Bellandur lake and (ii) phosphorous from detergents. High wind coupled with high intensity of rainfall leads to upwelling of sediments with the churning of water as it travels from higher elevation to lower elevation forming froth due to phosphorous. Discharge of untreated effluents (rich in hydro carbon and phosphorous) with accidental fire (like throwing cigarettes, beedi) has led to the fire in the lake. Colour of the flame and subsequent analyses of black particles (burnt residues) confirms the source (long chain hydro carbons) Based on these studies of preponderance of phosphates in domestic wastewater, surface waters and sludge/sediments and the increasing enrichments of these urban surface waters with large quantum of nutrient loads from untreated wastewaters comprising of P inputs from detergents and human excrements, the following actions needs to be implemented

1. Immediate reduction, and eventual eradication of phosphates in detergents through appropriate policy and legislations;
2. Awareness among consumers to select washing products with the least amount of polluting ingredients;

3. prompt promulgation of regulations requiring appropriate labelling of detergent packages listing of the ingredients and information about use of detergents in soft and hard water.
4. Enacting legislations to regulate/remove p based ingredients in household laundry detergents, as almost all detergents brands available in market invariably constitutes bulk of p based ingredients,
5. Identification of P detergent manufacturing units and inventorisation of phosphates based products in these units. Together with this a national accounting of total P imports, distribution, manufacturing into various end products and disposal of these commodities encompassing all sectors has to be documented.
6. More research and development on fate of P based ingredients in aquatic systems, from various sectors (Agricultural, Municipal etc.) has to be undertaken.
7. Incorporating mandates for nutrient (N and P) removal and recovery to the existing wastewater treatment systems that only focuses on BOD/COD and TSS removal as a criterion for disposal of water into streams and other surface water bodies.
8. Seeking participation from the local communities in surface and ground water quality monitoring and management and strictly applying the "polluter pays principle" to the rapidly declining surface waters would ensure conservation and protection of the fresh water resources.

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Environmental Management System and Pollution Control Techniques – Need of the Hour

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India is a developing nation. India is wellthought-out as the world's biggest boomingeconomies. Modernization has led to the development in the lifestyle and the basicneeds. The industrialization has led to development in diverse areas like agriculture, manufacturing sector, coal, timber, bottling plants, automobiles, gas and chemicals. Thishas developed the economy of India and the lifestyle of people living in the country.On the other hand, it had also led to the degradation of environment and the environmental conditions, the flora and fauna in different ecosystems, extinction of the rare species of animals, plants and birds and the depletion of natural resources.

Major Environmental Issues in India:

- Rapid growth in population is one of the cause for environmental damage, large area of forest has been cleaned for agriculture, factories, roads and railway tracks, industries have seriously affected the forest.
- Emissions from industries and vehicles has created adverse impact on the air quality, as per the WHO, the air pollution in big cities of India is 2-3 times higher than the amount recommended by WHO.
- Unavailability and poor management of waste water generated from domesticand industries contributed
- The Ganges River, in India has a stunning 1.1 million liters of raw sewage being disposed into it every minute.′ The high level of contamination of the river by human waste allow diseases like cholera to spread easily, resulting in many deaths, especially among children who are more susceptible to such viruses.′ More than 400 million live along the banks of Ganges.
- Increased rate of deforestation has cause soil erosion, and which leads to land pollution. Land pollution is due to discharging the untreated industrial waste water which contains toxic and harmful ingredients which has potential to pollute the ground water and well as change the soil to unfertile.

Protection of the environment is need of the day as the environment is becoming adverse day by day. The environment management system plays great role in protecting the environment by taking various steps under the environment management system. Environmental management system (EMS) refers to the management of an organization's environmental programs in a comprehensive, systematic, planned and documented manner.

Benefit of EMS for Protecting the Environment:

EMS is intended to formalize procedures for managing and reducing environmental impacts, reducing or eliminating waste or pollution. The last few years India have witnessed a growing awareness of not only the severity but also the diversity of environmental problems. EMS helps an industry to identify its environmental problems to reduce pollution and improve environmental performance gradually. It takes a holistic view of all the activities of an industrial unit (starting from quantity and quality of raw materials including water and energy usage, production and packaging processes to transportation of finished products) to identify the activities responsible for environmental degradation and to address these problems in a systematic manner. The presence of EMS may indicate environmental friendliness of an industries.

- EMS helps to manage and improve organizations environmental performance (managing negative impacts) and helping to increase resource efficiency (e.g. cutting waste and energy use)
- Comply with environmental laws and regulations.
- Generate financial savings through well-managed use of resources and efficient practices.
- Improve its standing and reputation with staff, client companies, partner organizations and wider stakeholders.

Initiatives by Government for protection of environment:

The central and state governments have developed environmental regulations that organizations must comply with. Ministry of Environment, Forest and Climate Change was established in 1985, which today is the apex administrative body in the country for regulating and ensuring environmentalprotection and lays down the legal and regulatory framework for the same.

Current government of India as taken following initiatives to protect the environment

Swachh Bharat Abhiyan - The Swachh Bharat Abhiyan is India's biggest cleanliness drive ever. The campaign covers as many as 4041 towns and aims at cleaning streets, roads, and infrastructure. It was officially launched on October 2, 2014 at Rajghat, New Delhi.

Clean Ganga Mission - A clean Ganga is deemed as current governments pet project. Government has prepared the Ganga Action Plan under the direct supervision of Water Resources Minister. Clean Ganga Plan involves five ministries working in close co-operation to see the dream project through.

National Air Quality Index (NAQI) - Focusing on bringing down soaring pollution levels in the country, Government has launched India's first national air quality index (NAQI) in April 2015. The Indian Institute of Technology in Kanpur, will house the main server of the NAQI which will monitor air quality levels in 10 cities throughout the country. The NAQI will simplify air quality rendition and will help raise awareness about alarming levels of air quality across the country.

Water Conservation - In a bid to raise awareness about water conservation, government directed the states of India to ensure that 50% of the work taken up by MNREGA, should be for the improvement of water conservation. This includes construction of check dams and de-silting of water bodies.

Environment Management System at Owens-Corning:

Owens-Corning management is committed for protection of the environment and conservation site is certified for ISO 14001:2015 Standard (Environment Management System). To identify the gaps and potential improvement in environment the EMS audit is conducted twice in year by internal trained auditors and twice in year by external agency. Apart from this Owens-Corning Taloja site has established and monitors the environmental performance as per the corporate standard on Environment Management System.

We have environmental organizational set up establish the role and responsibilities at various levels. We always take innovative initiatives for protection of environment and conservation of natural resources like

1. **CDM –**Under the Clean Development Mechanism (CDM) program, emission reduction program was taken. The Propane is used as fuel for process was replace with Natural Gas,
2. **Reuse of Waste Water** – The waste water generated from various processand sewage is treated processed of natural resources. Owens-Corning Taloja through Reverse Osmosis (RO). This treated waste water meets the parameters of potable water and used in the process. This helps in reduction of consumption of fresh water.
3. **Replacement of conventional lights to LED**.
4. **Water Conservation**: Use of diffuser type taps to avoid the wastage of water.
5. **Procurement of energy efficient electrical equipment's**
6. **Waste heat recovery –** The heat generated at furnace is collected through the waste heat recovery system, this heat is then transferred to cake oven for heating.
7. **To save water at canteen implemented diffuser type taps**
8. **Waste reduction &Segregation of waste at source**.
9. **Educating the employees on various environmental topics**.

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ROLE OF ISO 14001 IN POLLUTION CONTROL

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An Environmental Management System (EMS) is defined as a continual cycle of planning, implementing, reviewing and improving the actions that an organization takes to meet its environmental obligations. Most EMSs today are based on the recently issued ISO 14001 Standard.

Pollution prevention (P2) is an integral component of an EMS. P2 allows flexibility, effective long-term planning and increases efficiency.

An EMS provides a framework for organizations or businesses that are interested in continually improving environmental performance. Through this framework, environmental stewardship becomes the responsibility of all employees - not just the environmental department - and is integrated into everyday business operations. EMS offers organizations a method and opportunity to systematically establish and achieve P2 objectives for superior environmental performance.

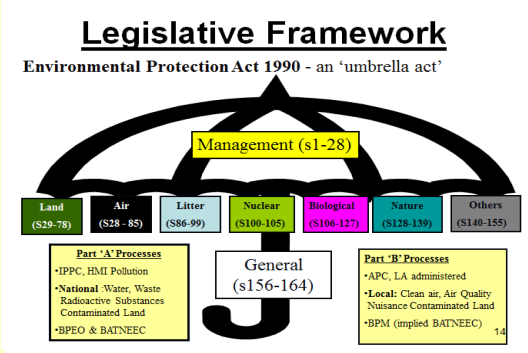
Prevention of Pollution

Use of processes practices, techniques, materials, products, services or energy to avoid, reduce or control (separately or in combination). Every organizations goal is sustainable development and that can be achieved by balancing the three pillars of sustainability. To achieve a balance between the environment, society and the economy is essential to meet the needs of present without compromising the ability of future generations to meet their needs. the creation, emission or discharge of any type of pollutant or waste, to reduce adverse environmental impacts.

Societal expectations for sustainable development, transparency and accountability have evolved with increasingly stringent legislation, growing pressures on the environment from pollution, inefficient use of resources, improper waste management, climate change, degradation of ecosystems and loss ofbiodiversity.

This has led organizations to adopt a systematic approach to environmental management by implementing environmental management systems with the aim of contributing to the environmental pillar of sustainability.

The Environmental Protection Act 1990 (initialism: EPA) is an Act of the Parliament of the United Kingdom that as of 2008 defines, within England and Wales and Scotland, the fundamental structure and authority for waste management and control of emissions into the environment.

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Jawaharlal Nehru Port Trust Green Port Initiative

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JNPT is committed to sustainable development and adequate measures are being taken to maintain ecological balance. The total land available with JNPT is around 3402 hectares out of this, 1147 hectares area (34%) of the port is under green cover including mangroves. As per direction of Ministry of Shipping GoI on Green Port Initiative, JN Port has prepared an action plan covering all activities of the Port including cargo handling, storing, evacuation and many other activities related to the environmental protection. The Port has taken steps to implement the Environment Management and Monitoring Plan (EMMP) which has been prepared by NEERI, Mumbai. The Green Port Initiatives also include installation of a new Sewage Treatment Plant, Environmental Monitoring, Solid Waste Management Awareness Trainings, upgradation of roads, projects related to use of renewable energy, Energy saving/conservation projects, marine conservancy, comprehensive plantation, MARPOL provisions and sustainable development in all operations. Point wise status as follows- E-RTGCs:

- JNPT has procured 15 nos. Electrically powered Rubber Tyred Gantry
- Cranes (E-RTGCs) in the year 2017 to augment the fleet in addition to the existing 12 Nos. diesel engine powered RTGCs. With the induction of these E-RTGCs, there will be reduction in the consumption of high speed diesel as the conventional RTGCs consuming around 15-20 litres of diesel per hour.
- Solar Power: JNPT has installed Solar Panels of around 822 KW on the rooftopsof the public buildings of JNPT at a total cost of Rs.4.47 crores, which is generating electrical power of about 80,000 to 90,000 units per month.
- Inter Terminal Tractor Movement Facility- In the month of December,17,063trucks completed 22,519 transactions using the Inter-terminal movement of tractor-trailer facility (ITT) fuel worth of INR 10 cr and total trade cost, INR 203 cr saved till date.
- Shore power supply provided to 8 tugs. And all port crafts. Due to this facility 2100 lit diesel/day and accordingly reduction in greenhouse gases emission is achieved. The port is planning to provide CNG facilities at Port area for which location havebeen identified and concurrence received from Mahanagar Gas.
- As part of Environmental Management and Monitoring Plan ambient air, marinewater, marine ecology, drinking water, sewage quality, noise level, emission of cargo handling equipment, emission of tractor trailers, PUC status of vehicles is monitored as per schedule. 4 MLD new sewage

treatment plant has been commissioned and water recirculated for non-drinking purpose. A new Multi- Purpose Utility Launch (MPUL) has been hired to combat minor oil spill, collecting floating debris and other similar purposes.

- Disposal of E-Waste and Scrap material - The E-Waste and scrap material are• being disposed as per the norms of MPCB. JNPT has Tier I facilities to combat oil spill at the Port area. The facility is commonfor Mumbai Port Trust and JNPT. Oil companies are also part of the MOU signed between the ports. In addition to the OSR Tier I facilities, OSR equipment is also available at the BPCL berth and the MPUL. Terminal and tugs are having facilities of oil spill dispersant(OSD)to combat smalloil spillage that may take place.

- The port provides shore reception facility to the ships to collect and dispose of garbage/solid waste through the port approved agencies.

- Reception facilities to the ships for collection of waste oil and sludge has been provided through 3 agencies empanelled with MPCB.

Training Programme on ISO 14001 & 45001 with SGS India Pvt. Ltd. On 21st and 22nd February, 2019

Institute has conducted a two day training programme on ISO 14001 and ISO 45001 on 21st and 22nd February, 2019 with SGS India Pvt. Ltd. Total 17 participants were registered for the programme.

Participants in training programme

Workshop on All India School Contest on Plastic Waste Management and Felicitation of Winners

A Workshop cum prize distribution programme was conducted for the winners of All India contest on Plastic Waste Management on 10th January, 2019 with Indian Centre for Plastics in Environment an ENVIS Centre under MOEFCC. The Chief Guest of the event was Mr. Ajay Shah, MD, Reliance Oil and Gas Ltd. Other eminent guests have participated from industries viz. Indian Oil Corporation., Supreme Industries, GAIL etc. The contest winners from Western, Northern and Southern zones have been felicitated in the event.

A view of inaugural session of the workshop

National Conference on Geoinformatics in Water Management on 23rd January, 2019

The National Conference on 'Geoinformatics in Water Management' was organized on 23rdJanuary 2019 with sponsorship from Maharashtra Pollution Control Board.In inaugural session Dr. Muralikrishna Iyyanki, Former Raja Ramanna DRDO Distinguished Fellow, RCI, Hyderabad was the Chief Guest of the conference. Dr. Y. B. Sontakke, JD - Water, MPCB was the Guest of Honour. In Valedictory session Dr. Amar Supate, Principal Scientific Officer, MPCB was the Chief Guest. Eminent speakers in the conference were Dr. Sanjay Dahasahasra, Dahasahasra Waternet Solutions, Thane, Former Member Secretary, Maharashtra Jeevan Pradhikaran, Mumbai; Prof. S. Gedam,CSRE, IIT Bombay; Mr. YogeshYande, ESRI; Dr. Mritunjay Chaubey, Chief Sustainability Officer, UPIL, and Dr. Avinash Kubal, Retd. Director Maharashtra Nature Park, Mumbai. The recommendations of the conference were communicated to relevant ministries and departments for action. Total 75 participants were registered in the conference.

A view of inaugural session

Release of Conference Souvenir and Institute's Newsletter

Workshop Cum Training Programme on Drinking Water Management in Urban Areas and Role of GIS in Mapping and Planning on 24th January, 2019 at SIES, Nerul Campus

Under NRDMS, Department of Science and Technology Project institute has organized a one day Workshop cum Training Programme on the topic, 'Drinking water Management in Urban Areas and role of GIS in Mapping and Planning. In the event 45 officials of different wards of MCGM from water supply, ground water and insecticide departments participated. The topics covered in the workshop were drinking water supply and management in MCGM, water quality parameters in different wards of MCGM, low cost water purification technologies, management of sullage and ground water recharging techniques.

Participants in Workshop cum Training Programme on Drinking Water Management and Mapping for Management under NRDMS, DST project on 24th January, 2019

Environment in News Headlines

Marine Litter and Environmental Justice

Environmental justice in the context of marine litter and microplastics pollution is a topic receiving growing attention. Vulnerable communities, including those who depend on wild seafood for their diet, face greater risks to their health and livelihoods from marine litter and microplastics, which can be a million times more concentrated with chemicals compared to the contaminated surrounding water.

UN Environment, 16th April, 2019

Biodegradable Plastic Bags Survive Three Years in Soil and Sea

The research for the first time tested compostable bags, two forms of biodegradable bag and conventional carrier bags after long-term exposure to the sea, air and earth. None of the bags decomposed fully in all environments.The compostable bag appears to have fared better than the so-called biodegradable bag. The compostable bag sample had completely disappeared after three months in the marine environment but researchers say more work is needed to establish what the breakdown products are and to consider any potential environmental consequences.

The Guardian, 28th April, 2019

Cruise Ship Pollution is Causing Major Health and Environment Problems

Cruise ships have often been described as 'floating cities', and as environmental groups have pointed out that they are just as if not more polluting. A passenger's carbon footprint triples in size when taking a cruise and the emissions produced can contribute to serious health issues. On top of the pollution caused by their exhaust fumes, cruise ships have been caught discarding trash, fuel, and sewage directly into the ocean.The data collected reveals that standing on the deck of a cruise ship is similar to being in one of the world's most polluted cities, with health experts warning of the issues surrounding poor air quality.

Forbes, 26th April, 2019

Ammonia in Mumbai's Air is Causing Air Pollution

A new study led by researchers at the IIT Bombay has revealed that ammonia in Mumbai's air is causing upper and lower respiratory diseases among residents. The annual average ammonia concentration for Mumbai is 85micro g/m3 which rates as moderate but can lead to ailments like cough, skin irritation and accumulation of mucus. The ammonia is mainly released in atmosphere from fertilizer industry, degradation of garbage etc.

The Hindustan Times, 14th April, 2019

Forthcoming Events

Training Programme on Waste Water Treatment system and Business Model Development from 8th to 10th May, 2019 in association with Ecoscan and CeWas South Asia.

Articles, photos etc. are invited for next issue (April - June, 2019) of the Newsletter on the theme 'Air Pollution Causes and Management'

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