



The wet garbage approximately half a tonne per day, which is essentially kitchen waste, is processed in the NISARGRUNA Biogas Plant. Thereby litter of waste is eliminated by producing bio gas, which is used in Guest House for serving the needs of about 120 persons per day. In addition to that good quality of organic manure is produced, which is used for horticulture activities in RRCAT. The NISARGRUNA Biogas Plant was inaugurated on 26th July 2014 by Dr. R.K. Sinha, Chairman, Atomic Energy Commission & Secretary Department of Atomic Energy, Government of India (Picture I.2.2).



*Picture I.2.2: The inauguration of NISARGRUNA Biogas Plant by Dr. R. K. Sinha, Chairman, AEC & Secretary, DAE. Dr. P. D. Gupta, Director, RRCAT and Dr. S. P. Kale are seen in the picture.*

The plastic waste and glass collected in centralized trash bin is lifted by vendors for recycling out of campus. The sole aim is to improve the environment and aesthetics of area. If not managed litter pollutes waterways and leaches toxic chemicals into soil and groundwater as it breaks down as well as pollutes the air.

The key for successful effective waste management lies in positive mindset of people living in the area. The well aware residents of RRCAT colony have cultivated the habit of waste minimization, segregating the waste and dumping the waste at designated places. CSD acknowledges the contribution of one and all for preserving the environment. The clean and green campus without any pile of dumps has set an example of excellence.

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### I.3 : Multipurpose fire tender at RRCAT fire station

A multipurpose fire fighting vehicle has become part of the RRCAT fire station. The design of chassis, configuration and manufacturing specifications for the complete fire tender system were provided by RRCAT fire and safety engineers and it was manufactured under strict quality surveillance of internationally reputed inspectors. The vehicle (Picture I.3.1), shown below, has been built on Tata chassis 1613c and has five modes of fire-fighting; dry chemical powder, carbon dioxide, water, foam and water mist system. The small size of the vehicle ensures its reach to difficult places in quick time. The vehicle is compliant with IS 950 for water tender, IS 10460 for foam tender, EN 1028-1 for water pump and NFPA 750 for water mist system.



*Picture I.3.1: The multipurpose fire tender*

The vehicle is equipped with water tank of 4500 liters capacity and foam tank of 500 liters capacity, made of 5 mm thick austenitic stainless steel 316L plates. These plates are welded with ER317L filler using ASME B & PV code section IX procedures with 100% radiography of T joints to provide enhanced protection against the use of normal municipal water. The water and foam pump can deliver 3200 LPM at 7 bar pressure and 300 LPM at 40 bar pressure. The performance of the water pump (Picture I.1.3.2) is certified by Underwriters Laboratory. The vehicle also has one cylinder of dry chemical powder of 75 kg and one cylinder of CO<sub>2</sub> of 22.5 kg.

The vehicle can carry one driver cum operator and six firemen in the cabin that also houses two number of breathing apparatuses. The fire-fighting accessories are stowed in



ergonomically designed multi-tier racks that are accessible from both sides. Unique features of this vehicle include a light robot (Picture I.3.2) and a very fine water mist system (Picture I.3.3) Roof mounted light robot is equipped with four numbers of 1000 W metal halide lamps that can be pneumatically elevated up to a height of 4.6 m and maneuvered using 360° rotation and tilts, for total coverage.



*Picture I.3.2: Water pump and light mast*

Lighting is powered by 6.5 kVA capacity portable diesel generator. The remote control unit allows a person to operate all the functions of the light mast and accurately aim for complete directional positioning. In addition, auto-show is also included in the remote controller, which automatically retracts, turns the lights and stows the entire system to the compact transport position on one button command.



*Picture I.3.3: The water mist system in operation*

The water mist system provides mist of 200 micrometer size through a specially constructed nozzle to provide cooling by swift evaporation. The mist gun is powered by Interpump's 120 bar reciprocating pump and Lombardini's diesel engine, which can run for two hours continuously with a separate fuel tank. The water consumption is extremely small (09 - 30 LPM) and the system can work completely independent of the water and the foam systems of the vehicle. The system can provide hours of efficient fire-fighting with its 60 meter hose length, at places where availability of water and vehicle movement are limited. This system can also provide a protective mist umbrella to the firemen while they are amidst fire to save lives.

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