

A large green circular graphic is centered on the page. Inside the circle, there is a blue and white globe of the Earth. On top of the globe, there are silhouettes of a tree on the left, an elephant in the center, and a giraffe on the right. The background of the slide is white with faint green decorative lines.

EMERGING APPROACHES IN WASTE WATER TREATMENT

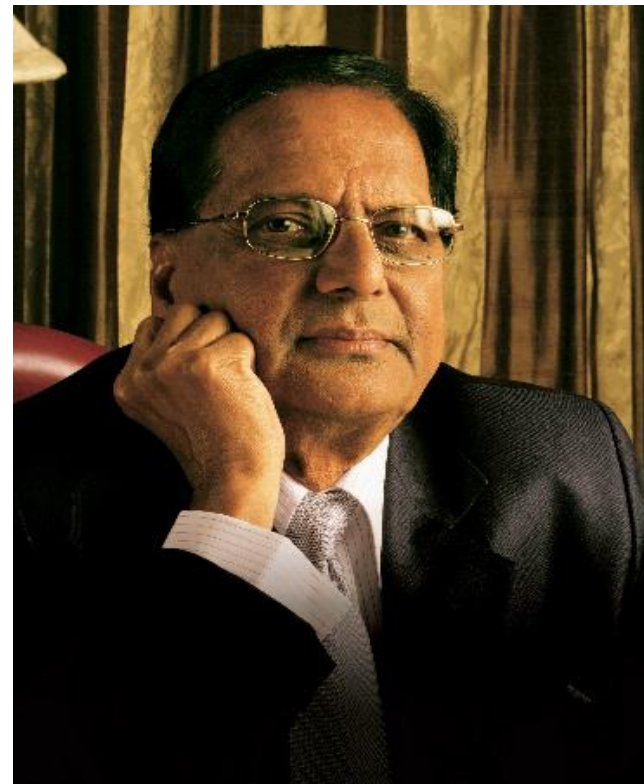
API UNIT II DR.REDDY'S LABORATORIES LIMITED

**International Conference on Innovations in Sustainable
Water & Wastewater Treatment Systems (ISWATS)
YASHADA, Pune | April 21-23, 2016**

OUR PURPOSE

“We accelerate access to affordable and innovative medicines because

Good Health Can't Wait”



Dr. K. Anji Reddy

COMMITMENT TO ENVIRONMENT



Our commitment to the environment

To become a sustainable organization, we need to conserve natural resources and reduce our ecological foot print on an ongoing basis. Towards this objective, we commit ourselves to the following environmental performance targets:

1. Minimize our Carbon Footprint by continually reducing our specific energy consumption, increasing usage of renewable energy and off-setting our GHG emissions.
2. Aim at reducing our specific consumption of energy by about 5% every year over the next ten years, so as to achieve a 40% reduction by the year 2020.
3. Strive to increase the percentage share of renewable energy in our total energy consumption by about 2.5 % every year over the next ten years, such that the renewable energy share reaches 25% by the year 2020.
4. Aim at reducing our specific consumption of water by about 5% every year over the next ten years, so as to achieve a 40% reduction by the year 2020.
5. Strive to become water neutral by the year 2020, by replenishing the water table with an amount of water equal to what we consume, using means such as rain-water harvesting.
6. Attempt to reduce our specific generation of hazardous waste and reduce the quantum of hazardous waste sent by us to landfill / incineration by about 5% every year over the next ten years, so as to achieve a 40% reduction by the year 2020.
7. Strive to purchase environmentally friendly products and services and extend our environmental commitment to our vendors & partners.

1st June 2009

G.V. Prasad



ZERO LIQUID DISCHARGE PLANT

We have Zero Liquid Discharge plant for the treatment of effluents from API manufacturing. Process & Non process effluents are segregated at source.

The Process effluent is sent to Stripper, Multiple Effect Evaporator(MEE) and ATFD system.

The condensate from the MEE is treated in Biological system and treated water is used in cooling tower.

The Non process effluent is pre-treated and sent to Biological system followed by 3 stage Reverse Osmosis(RO) system i.e. UF/ NF/ RO system.

Permeate from RO system is used in boiler and RO Rejects are sent to MEE followed by ATFD system.



SALIENT FEATURES

- We had set the state of the art ZLD in 2004 – one of its kind in Pharma sector in our country
- Effluent from four units is treated in the ZLD
- Dedicated treatment schemes for Process and Non process effluent
- Steam stripper with reflux system to enrich solvent in stripper distillate
- Replaced spray dryer with ATFDs to treat MEE concentrate
- Robust biological system with the Bio outlet suitable for Cooling tower make up
- Membrane system running with 75% efficiency for past ten years without change in membranes
- Paddle dryer for drying the ETP sludge producing outlet salt with 5% moisture



REFLUX SYSTEM FOR STEAM STRIPPER

- The Process effluent after pre-treatment is fed into stripper and the stripper condensate is refluxed within the system.
- The continuous reflux system enriches the percentage of solvent in the stripper top.
- The stripper distillate possess high solvent content that has been sent to Co-processing trial.
- This improves the distillation efficiency of stripper and reduces load to MEE.
- Eliminates the further distillation of stripper distillate.



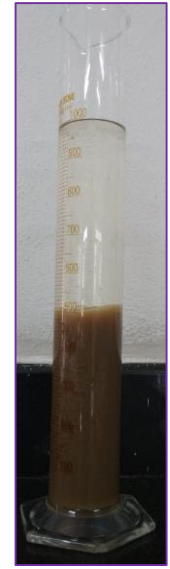
ROBUST BIOLOGICAL SYSTEM

- The condensate from the MEE is treated in the activated sludge process. The MLSS is improved from 2500 mg/L to 6000 mg/L with 80% of MLVSS.
- Phosphoric acid is added in continuous basis to enhance the biological activity.
- The COD removal is improved tremendously with the continuous addition of Folic acid at the feed input.
- Inlet COD is around 6000 mg/L and the outlet COD around 150 mg/L.



FOLIC ACID IN BIOLOGICAL TREATMENT

- Folic acid – a B-complex vitamin is a micronutrient added to the biological system to accelerate the microbial activity. The benefits of folic acid addition to biological system was proven from 1995.
- The continuous addition of Folic acid in the feed input or the return sludge line,
 - Enhances the growth and metabolism of the microbes
 - Control the filamentous, pin floc and dispersed growth
 - Prevents filamentous bulking and improves the nitrification process
 - Increases sludge age and reduces the sludge wasting
- Previously, it was a challenge to optimize the sludge wasting without filamentous growth. Addition of Folic acid increased Bacterial activity and the bacteria in low F/M ratio gets acclimatized even to the complex organic compounds in the effluent.



DECANTER CENTRIFUGE - REDUCTION OF MOISTURE

- The sludge from the ETP is given pre treatment and then fed into the decanter.
- Separate decanter for Process and Non process sludge is provided.
- The process centrate is sent to MEE. The Non process centrate is directly sent to Bio followed by RO.
- This reduces MEE treatment for Process decanter centrate and eliminates corresponding emissions.



PADDLE DRYER – INITIATIVE FOR ZERO WASTE TO LANDFILL

- ETP sludge is treated in decanter and the sludge generated is sent to paddle dryer.
- This provides ETP salt with 5% moisture and the % of salt generation is 89% less with that of decanter.
- This saves the cost of disposal and also reduces the waste that has to be sent to landfill.



MECHANISATION OF ATFD SALT LOADING



- Solid waste generated from the ATFDs are packed in HDPE bags and sent to TSDF for secured land fill.
- Provided belt conveyors for loading the bags in the TSDF container.
- Avoids the manual handling and exposure to hazardous waste.

MULTI STAGE SCRUBBER FOR ALL ZLD VENTS

- Dedicated multi stage Scrubber with online pH monitoring are provided to MEE, ATFD and paddle dryer.
- All possible vents are connected to Scrubber.
- Sodium hypo chlorite and caustic lye are being used as scrubbing media



CO-PROCESSING – JOURNEY TOWARDS ZERO WASTE TO LANDFILL

- We started co-processing in 2008 with a cement industry in Andhra Pradesh with Organic residue and spent carbon.
- The hazardous wastes are being segregated for co-processing based on calorific values.
- The initiative is still continuing and we are exploring the opportunities with many more cement industries to increase the alternate reuse potential by sending the ETP sludge and Mixed salts.





THANK YOU