

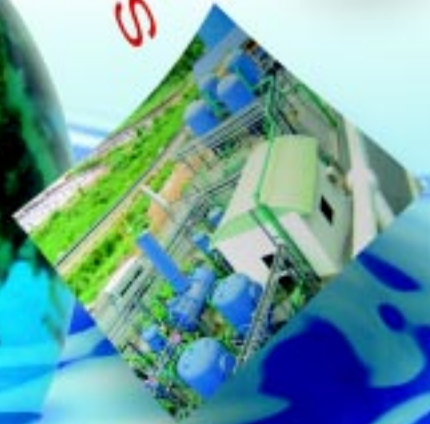


IEI NEWS

A House Journal of Ion Exchange (India) Ltd.



Expanding Horizons



Malaysia • Thailand • Indonesia • Japan • Nepal • Bangladesh • Sri Lanka
Tanzania • Nigeria • Australia • UK • Europe • Saudi Arabia • Oman



India *Internationally Shining* has certainly been the experience of Ion Exchange (India) Ltd. (IEI) in the global arena, with the *feel-good* factor running high at IEI's International Division. A strategic focus on exports is seeing a sharp rise in physical exports, now at 15% of turnover. Continuous benchmarking with the best and a sustained drive to raise the quality bar, was rewarded by breakthroughs, first in the demanding Japanese market, and recently in Europe. International sourcing is honing cost competitiveness. And a demonstrated commitment to customer satisfaction has built up reservoir of customer confidence and goodwill overseas, winning us a spate of repeat orders. Across the board, Indian industry has geared

up to international standards, and Indian manufactured goods are finding increasing acceptance in the global market. There is widening cooperation among ASEAN/OIS countries, and a revival of economies. The service sector worldwide is growing at an average of 15% annually. The need for water and environment management is intensifying as globally, the water crisis deepens, compelling a concerted thrust on water conservation and stringent pollution control. All converging synergistically to open new vistas for a growing global presence for IEI.

Setting Up on Foreign Shores

Joint Venture in Malaysia

IEI Water-Tech (M) Sdn. Bhd. has been set up as a joint venture in Kuala Lumpur to service Malaysia, a specially privileged country of ASEAN and OIS countries. Its main focus will be on infrastructural, power and community water supply projects including O&M, while water treatment chemicals, resins and consumer products will be marketed through our distributor network.

Service Company in Bangladesh

IEI has supplied more than a hundred plants in Bangladesh over the last 20 years. In order to better service these customers, particularly for O&M, we have now set up a separate service company, Ion Exchange (WTS) Bangladesh Ltd., in Dhaka.

The environment, economic growth and development of Bangladesh are all highly influenced by water – its availability and quality. The water-related problems that beset the country are very similar to those we face in India – increasing water scarcity, increasing pollution and deteriorating quality of water. We have therefore also set up a *liaison office* in Bangladesh which will continuously and closely interact with industry, to better understand needs and offer value-added solutions.

Mr. R.R. Das, Minister (E&C), High Commission of India, Dhaka (centre), was Chief Guest at the well attended function held to launch our service operations in Bangladesh. With him are Mr. Rajesh Sharma, Managing Director (right), and Mr. M.P. Patni, Director, Ion Exchange India.



Gaining Ground in the East

Way back in the mid '70s, we established our credentials in SE Asia with the supply of demineralisation plants to the National Electricity Board's Tuanku Ja'afar Power Plant in Malaysia. There was no looking back thereafter, and we have since then successfully executed more than a hundred projects for diverse industries in Thailand, Indonesia and Malaysia. This has put us in a vantage position today, as opportunities in SE Asia open up, particularly in the engineering sector, for reliable Indian suppliers of engineered equipment.



Some recent contracts awarded to IEI:



Mitraphol, Thailand, a leading multi-business Thai group, awarded us the contract for a water treatment plant for their power project at Danchang, around

300 kms from Bangkok. The water treatment package incorporates a 100 m³/h softener, 60 m³/h demineraliser, 75 m³/h condensate polishing unit and 100 m³/h side stream filtration. It will supply water to the captive power plant which is being built by an EPC.

From PT Prima Elektrik Power, Indonesia, a 550 m³/h pretreatment plant through PT Siskem Aneka, Indonesia. The plant, which will treat river water, comprises two high rate solids contact clarifiers of 16 m. dia. each, followed by a gravity dual media filter. We also received an order for a demineralisation plant from this customer.

This contract awarded by Marubeni Corporation,



Japan, was for supply of a complete 170 m³/h water treatment system for a power project in Vietnam

by VINACOAL, a Government owned power company, which uses coal as fuel. The project is at Nauong, around 1,000 kms from Ho Chi Minh City. Successfully commissioned in January 2004, our plant incorporates a 320 m³/h pre-treatment (clarification & filtration) plant followed by a 2 x 20 m³/h demineralisation plant. Waste water of the complete power project is treated at a flow rate of 170 m³/h. The entire plant is PLC operated with DCS controls.

Under construction by Kawasaki Heavy Industries, Japan, is a power plant project at Tanjung Jati in Indonesia. IEI was awarded the contract for the water treatment plant consisting of six large (3.4 m. dia. x 6.5 m. length) horizontal filters followed by two streams of demineralisation at 150 m³/h. It was executed in a record five months.

Mitsubishi Heavy Industries, Japan, EPC contractor to the federal power company, Tenaga National Board of Malaysia, is building a 750 MW power plant at Port Dickson near Kuala Lumpur. The



water treatment package – demineralisation and waste water treatment plants, each 50 m³/h, for this was sub-contracted to us – in fact, a revamp of the first plant supplied by IEI to Malaysia for the then Tuanku Ja'afar project.

From Kawasaki Heavy Industries, Mindano, Philippines, an order – with a 10 month delivery period FOB Mumbai – for design, engineering and supply of mechanical equipment for plant comprising pretreatment capacity 2 x 155 m³/h; demineralisation plant capacity 2 x 45 m³/h; waste water treatment plant capacity 35 m³/h; and sewage treatment plant of 30 m³/day.

1,800 m³/h
(4 x 4,500
m³/h) high
rate solids
contact
clarifiers at
PT Riau
Andalan Pulp
& Paper Mills,
Pekambaru,
Indonesia –
river water
treatment for
process use.



A contract from PT Indo Bharat Rayon, Indonesia, for four softener plants, each 250 m³/h, and a 15 m³/h demineralisation plant.

Neighbourly Ties

Peace treaty time last year in Sri Lanka saw our business from the infrastructural sector, as well as for resins and sugar process chemicals, pick up considerably. We were successful in getting three ADB funded sewage treatment projects for Suryo Weva, Vitharandeniya and Mulleriywa towns under the Water Board of the Sri Lankan Government.

Our waste water treatment plant supplied to a hotel in Sri Lanka earned the Green Globe award by the Environmental Protection Authorities (EPA), Sri Lankan Government.

Our 20 m³/h water treatment system for an IT park in Nepal will treat underground (inlet) water containing ammonia, organics and iron, and incorporates forced draft aeration for iron removal followed by sand and carbon filtration. The order also includes four Zero B Pristine 25L reverse osmosis units for drinking water.

Into Africa

At Serengeti Breweries in Tanzania, we successfully commissioned and handed over a 10 m³/h reverse

Earning EPC Confidence

Successful multi-project execution to quality and time commitments of EPC contractors overseas has helped forge strong ties and obtain repeat business. Some of the EPC contractors we have worked with:

- ABB Limited
 - Alstom
 - Chiyoda Corporation
 - Daelim Engineering
 - Hanjun Korea Heavy Industries & Construction Co. Ltd.
 - Hitachi
 - JGC Corporation
 - Kawasaki Heavy Industries
 - Mannesmann Seiffert
 - Marubeni
 - Mitsubishi Heavy Industries
 - Stork Ketels
 - Technip
 - Vivendi
- ...and many more



osmosis system, with a 55 m³/h pretreatment plant. This is the first plant supplied overseas which incorporates MIOX (mixed oxidants) disinfection.

Through EPC Alstom for the OKPAI power plant in Nigeria, a turnkey contract for a complete water treatment package (120 m³/h x 2 streams) along with supporting dosing system and potable water system packages. The project calls for documentation and other standards as per European norms.



Down Under

Our first engineering order from Australia was from Omega Chemicals. The contract is for a 6 m³/h fully



The entire plant was assembled at our Rabale EOU. The Australian Government has extremely strict quality regulations for imports with respect to safety and health. Specifications therefore included fumigation of the entire plant including packing material and packed containers before despatch.

automatic brine softening unit (our third overseas order for brine softening) for their bleaching plant in Victoria. The plant incorporates pressure vessels in rubber lined (food grade) carbon steel. All piping (frontal and interconnecting) is in plastic.



Mr. A. Manocha (last row, centre), who heads our international business, participated in the IXth Commonwealth Study Conference in Australia, along with delegates from other Commonwealth nations. Visits included social institutions, power stations and public sector utility boards. Ours was the only company in the water and environmental field to be selected from India.

Westward Bound

Our first breakthrough in UK is the order for mechanical supply of demineralisation plant equipment through a UK-based EPC. The plant will consist of 3 streams of split flow cation exchanger and stratified split flow weak/strong based anion exchangers each of 230 m³/h.

In the Gulf Region

After successful execution of a brine softening plant for



Simon Carves, UK, through Simon India, we received another order, for the supply of a reverse osmosis plant, followed by a mixed bed unit, for the sulphuric acid plant coming up in Saudi Arabia. The entire plant is pre-assembled and skid mounted with CPVC pipework as per international specifications.

From EPC Technip, we won, against international bidding, a contract for supply of condensate treatment plant for a fertiliser project being set up in the Sultanate of Oman which will be the largest in the Gulf region. The fully automated plant incorporates

3 streams of condensate polishing units, one of which will operate at 750 m³/h. The entire plant including all electrical cabling and instrumentation, was assembled at our EOU centre at Rabale, Maharashtra, before

despatch. Automation too was fully tested before despatch to site. Shipment in assembled condition minimised site erection work.



INDION[®] Resins – The Preferred Choice

Continuous quality improvement and product development by our R&D and Resin division have borne fruit – a four-fold growth in our resin business from international markets. Our cation resins for food grade applications have been accepted by major customers in Europe, SE Asia and Africa, as have our speciality resins for pharmaceutical applications.

ZERO B Ultimate RO System: Under-the-Counter

The recently launched Zero B Ultimate RO Under-the-Counter model is an advanced water purification system that produces natural tasting, crystal clear, pesticide-free water of the highest purity. Multi-stage reverse osmosis (RO) eliminates harmful dissolved metals, brackishness, bad taste and odour, while the special bactericidal cartridge (the only purification system in India to have this) ensures that the water is absolutely germ free.

This economically priced 5 l/h unit is compact and space saving as it can be fitted under the sink. A number of additional features completely eliminate problems generally experienced with RO systems –

- Low pressure (and thus low fouling) membranes
- Voltage shield – protects the pump motor from burn-out
- Water level controller – non-wired tank level control ensures pump cuts off when the tank fills up
- Auto wash – periodically flushes the membranes to remove salt deposits and thus enhances the life of the membranes
- Hydro pneumatic tank – acts as a 8-litre capacity storage tank which dispenses pressurised water.



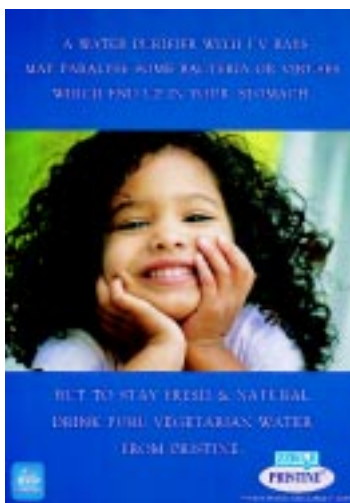
ZERO B Pristine UF

With the recently launched Zero B Pristine UF, consumers can enjoy pure, safe, and clear vegetarian water.

Erstwhile users of UV purifiers no longer need worry about paralyzed/



Mr. Rajesh Sharma, Managing Director, launches the Zero B Pristine UF at Joggers' Park, Bandra, Mumbai, where health conscious joggers thronged to slake their thirst with pure, safe, "vegetarian" water which was served free.



dead bacteria and viruses ending up in their stomachs along with their drinking water (UV purifiers paralyse and inactivate bacteria and viruses but do not remove and drain them away).

Zero B Pristine UF drains away bacteria, viruses and pyrogens. It also comes with a water storage facility which regular UV purifiers do not provide. So, no more waiting for the water to flow. At the press of the faucet, get pure instant Safe Vegetarian Water.

How does ZERO B Pristine UF work?

The purifier uses the advanced ultra filtration technology to purify water. It incorporates a membrane separation process with pores as tiny as 0.01 micron. These pores physically separate the bacteria and viruses from the water, flushing out the impure water to the drain and the purified water is collected in the tank.

Five-stage Purification Process

Stage 1: Prefilter – removes larger dust and dirt particles.



Stage 2: Sediment Filter – removes suspended impurities and turbidity; makes the water clear and sparkling.



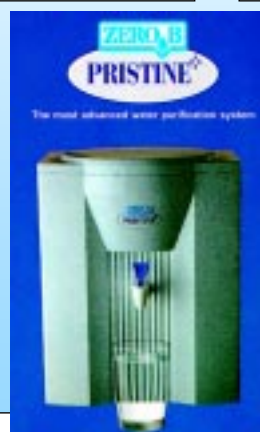
Stage 3: Bacteriostatic Activated Carbon – removes organic impurities, carcinogenic chemicals, chlorine, colour and odour. Adds crispness to the taste of the water.



Stage 4: Ultra Filtration Membrane – removes bacteria, viruses and pyrogens making water pure and safe.



Stage 5: Polisher – works as a guard bed ensuring complete removal of bacteria. Offers double protection and safety.



At Vashi – A Whole New World of Health



Our company-owned ORGANO WORLD Health Food and ZERO B Pure Water Solutions retail shops at Vashi, Navi Mumbai, were inaugurated by Mr. Sanjeev Ganesh Naik, Mayor of Navi Mumbai.

At the well attended function, Mr. Rajesh Sharma, Managing Director, said “The launch of these good health shops will be a boon to the people of Vashi, providing pure drinking water and healthy food at a time when pollution and pesticide contamination of water and food is causing major health concerns.”



The ZERO B Pure Water Solutions outlet offers customers a whole range of purifier options – on-tap, on-line and counter-top drinking water purifiers including advanced reverse osmosis (RO), ultra filtration (UF) purifiers and sophisticated water conditioners. Consumers can also bring their water for free testing. A Zero B water vending station at the outlet, dispenses pure, fresh water at just Rs. 2 per glass and Rs. 6 per litre.

The ORGANO WORLD Health Food outlet offers certified organic produce – grains, cereals, pulses, spices, flour, jaggery and dry fruits. The organically farmed food is healthy and nutritious, pure and unadulterated; free from toxic fertilisers, pesticides, and insecticides, synthetic preservatives and additives.

Altogether a whole new world of good health for the people of Vashi.



100% Natural Organic Inputs



Leveraging its experience in organic farming, our agri-subsiary Ion Exchange Enviro Farms Ltd. has developed a range of organic inputs – herbal pesticides, liquid manure and compost, under the ORGANO brand.

These will prove a boon to farmers at a time of increasing concern in the domestic market about chemical pesticide

levels in food and water, rejection of exports of grapes and other fruits due to high pesticide residues and tougher EU regulations on usage of chemical pesticides on food crops.

ORGANO Herbal Pesticides



ORGANO Liquid Manure



ORGANO Compost



Second Rail Neer Project Commissioned

The Rail Neer plant at Khagaul, Danapur, Bihar, was inaugurated on February 27, 2004. Supplied by IEI to the Indian Railways Catering and Tourism Corporation (IRCTC), the packaged drinking water plant, capacity 1.5 lakh bottles/day, will initially operate at 48,000 litres/day. The Danapur plant will meet the requirements of running trains and all major stations of the Eastern, South Eastern and North Eastern Railways and all five divisions of the East Central Railway.



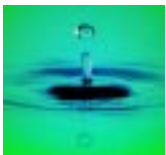
In May 2003, IEI had supplied and commissioned the Indian Railway's first packaged water plant at

Nangloi, near New Delhi, to meet the demands of the Northern, North Western, North Central and parts of Central Railway.

The state-of-the-art plants employ multi-stage purification processes. These include disinfection, special grade activated carbon, softening, ultra filtration, reverse osmosis and ozonation processes; membrane technologies as well as a special carbon column have been incorporated to produce pesticide-free water of highest quality. The plants are complete with blow moulding and filling machines, air compressors and DG set for electricity generation, labelling & packaging machinery and a full fledged laboratory with facilities for mineral and bacteriological analysis of the packaged water.

Both contracts include O&M services.

Major Engineering Orders



From ACC Ltd., Chaibasa, Jharkhand, a water treatment plant and dosing systems, comprising 2 x 50 m³/h filtration, 2 x 45 m³/h softening, chlorination, 2 x 4.8 m³/h demineralisation and low pressure (LP) dosing.

From Indian Aluminium Co. Ltd., Kolkata, for their Hirakud project, plant consisting of solids contact clarifier with sludge disposal system, a 20 m³/h stream of demineralisation chain including vessels, resins, degassed water pump, DG blower, piping, valves, fittings, instruments and accessories, and a demineralised water storage tank with instruments and accessories. DCL Kolkata is the client's consultant.

For Hindalco Ind. Ltd., a 2 x 53 m³/h semi-auto PLC based demineralisation plant for their Copper III unit at Dahej at Dist. Bharuch, Gujarat. TCE Consulting Engineers, Bangalore, is the client's consultant.

From Saw Pipes Limited, for their 351 cu.m. mini blast

furnace project at Mundra, Gujarat, a 125 m³/h make up water treatment plant, a 2 x 50 m³/h reverse osmosis plant, and a 8 m³/h mixed bed unit. Mecon, Ranchi, is the client's consultant.

An order for a total water management system from Bhushan Limited, Kolkata, for their integrated steel plant at Rengali, Dist. Sambalpur, Orissa. Mecon, Ranchi, is the consultant. The semi-automatic, PLC operated plant consists of:

- 1200 m³/h pretreatment with cascade aerator, flash mixer, flocculation tank, lamella clarifier and pressure sand filter
- 3 x 180 m³/h softeners
- 2 x 22 m³/h demineralisers
- 2 x 200 m³/h auto valveless gravity filters (AVGF) for sidestream filtration

ONWARD MARCH

From VVF Limited, Talaja, a 600 m³/day effluent recycle plant comprising high rate solids contact clarifier, lamella clarifier, dissolved air flotation, bio-tower, membrane bio-reactor, reverse osmosis section and dosing systems. This will be the first membrane bio-reactor to be installed in India.

From Chennai Petroleum Corporation Ltd., Manali, a zero discharge effluent and sewage recycle plant, capacity 200 m³/h feed. The plant comprises pretreatment, filtration, ultra filtration and reverse osmosis. This is the first

recycle plant we will be supplying to a refinery.

From Aquagel Chemicals Pvt. Ltd., Bhuj, Gujarat, an order for augmentation, from 300 m³/day to 600 m³/day, of the total water management system through supply of plants of capacities 300 m³/d feed and 80 m³/d feed. This is a repeat order.

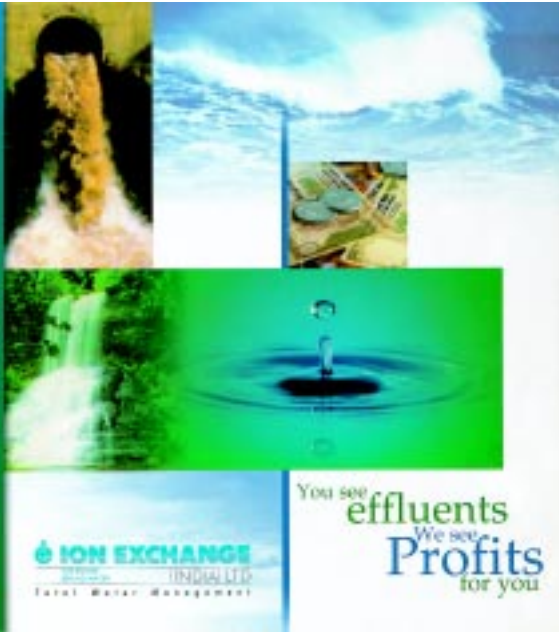
From Sterlite Industries, Tuticorin, a 150 m³/h activated carbon filter and softener.

From Chemplast Sanmar, Metturdam, Salem, Tamil Nadu, an order for mercury removal plant.

From Param Industries, Gandhidham, Gujarat, a 40 m³/h reverse osmosis and a 30 m³/h demineralisation plant.

From Global Oil and Fats Ltd., Gandhidham, Bhuj Dist., Gujarat, a 2 x 18 m³/h reverse osmosis (RO) plant followed by demineralisation for their power plant requirement, and a 10 m³/h RO plant for process water treatment for their plant coming up at Gandhidham in Gujarat. Reject from both RO units will be taken to a secondary RO to produce another 10 m³/h permeate for process requirement. M.N. Dastur, Chennai, is the client's consultant.

A 20 m³/h RO plant and a 45 m³/h demineralisation plant, from New Burg Engineering, Noida, for their overseas project.



Earning Customer Confidence

The proven performance and service associated with plants supplied by us have built up a large reservoir of customer confidence and loyalty, demonstrated by repeat orders:

Jindal Group

From Jindal Polyester Limited, Nasik, a repeat order for augmentation of effluent treatment plant, capacity 900 m³/day. The plant consists of dissolved air flotation, two-stage aeration, DynaSand continuous sand filters and activated carbon filters. It is designed to treat streams of polyester effluent containing high BOD (12,000 ppm) & COD (20,000 ppm). From Jindal Steel & Power Ltd., Raigarh, a 400 m³/h pretreatment plant (high rate solids contact clarifier), also a repeat order.

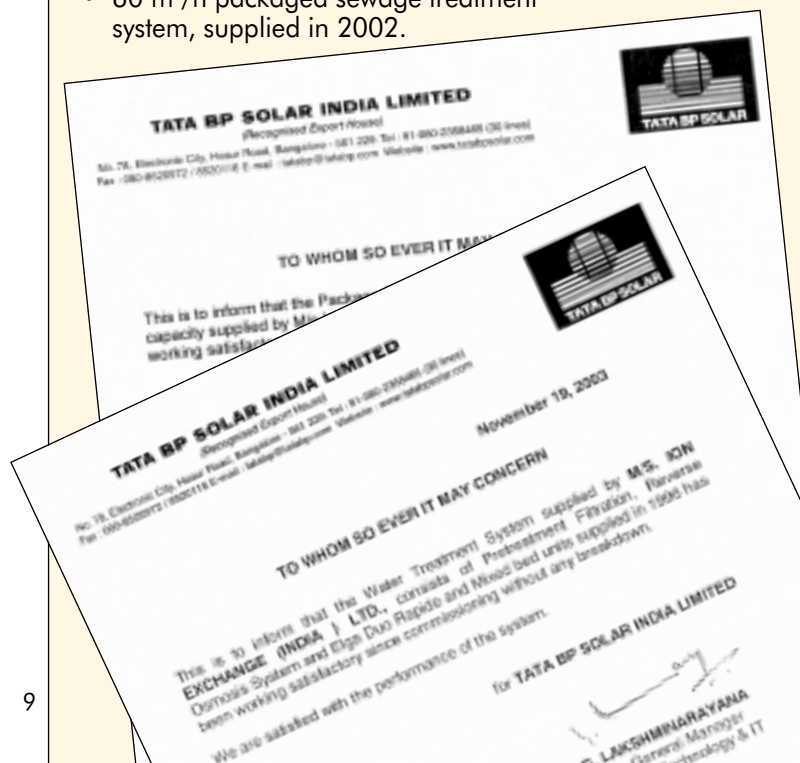
TISCO

From TISCO West Bokaro, Bihar, a total water management services consultancy contract and an order for refurbishment of conventional clarifier. And from TISCO - CRM, Jamshedpur, Jharkhand, a new demineralisation plant, capacity 10 m³/h, as well as renewal of the three year O&M contract, proof of the customer's confidence in our operation of the entire water and waste water system. A 2 x 10 m³/h pretreatment and demineralisation plant from TISCO, G Blast furnace, Jamshedpur. The plant consists of pressure sand filters, activated carbon filter, cation-degasser-anion units for each stream, plus modification of the existing softening plant (2 x 12.5 m³/h). Also, a contract for rehabilitation of the softening plant.

Customer Accolade

We received an appreciative commendation from customer Tata BP Solar India Ltd., Bangalore, on the performance of the plants supplied "which have been working satisfactorily since commissioning without any breakdown". Several plants have been supplied by us over the years:

- A water treatment plant consisting of pretreatment filtration, reverse osmosis, Duo Rapide demineralisation and mixed bed units, supplied in 1996 with a repeat order for the same in 2002.
- 60 m³/h packaged sewage treatment system, supplied in 2002.



In the Infrastructural Sector



From Public Works Dept., Panaji, Goa, a 12.5 MLD sewage treatment plant based on Cyclic Activated Sludge Technology (C-Tech) for the city. The largest sewage treatment plant supplied by IEI, it is also the first domestic sewage treatment plant based on C-Tech in India. It includes a five-year O&M contract. This order is a breakthrough in the infrastructure segment. For this job we entered into joint venture with H.N. Bhat & Company, Pune.



This expansion project *Environmental Upgradation of Panaji City Phase I*, scheduled to be completed by February 2005, will service the city's population up to 2031. The project has received financial assistance from the Ministry of Forests & Environment.

Mr. Manohar Parrikar, Chief Minister of Goa, laid the cornerstone of this modern sewage plant at Tonca, Panaji, in the presence of the Power Minister Mr. Digambar Kamat, Mr. Sudin Dhawalikar, Public Works Department Minister, the Mayor of the City Corporation of Panaji and many other dignitaries.

"With the completion of the project," the Chief Minister said, "the long felt need of the city of Panaji to upgrade its sewage infrastructure will be solved. 2004 has been declared *Year of Roads and Sewage* in Goa, and once this sewage treatment plant becomes operational, other cities in Goa will also undertake similar projects."

The 1000 l/h disaster management unit (DMU) for drinking water supplied to the PHED, Meghalaya, was inaugurated by the PHE Minister, Mr. Martle Mukhim, who confidently drank the purified water during the demonstration. The mobile water treatment unit, introduced for the first time in the North East, will be stationed at Tura and used primarily in Garo Hills where floods frequently disrupt regular water supplies.



Rural Development Engineering Department (RDED), Bangalore, placed an order for 10,000 domestic defluoridation units. RDED had floated a tender for 50,000

units, as the ground water in many districts of Karnataka has TDS > 3 ppm. Trials conducted with our domestic defluoridation point-of-use unit using activated alumina technology, were successful and we were among the five parties selected for supply of the 50,000 units, distributed equally among them. We will be supplying these units for use in the districts of Gulbarga and Raichur.



From the PHED, Nadia division, West Bengal, an order for a 90 m³/h drinking water plant, comprising iron and arsenic removal, dosing system and DynaSand filter.

Through NGO SHARE, Mumbai, a breakthrough order for our newly developed iron removal handpump attachment, installed and commissioned at village Tondsure, Mahasala taluka, Raigad district, in Maharashtra.



A repeat order for seven fluoride removal handpump attachments received from Zilla Parishad, Akola, Vidarba district of Maharashtra, where fluoride levels in water range from 2 - 4 ppm (WHO limit 0.5 ppm). We had earlier supplied three such units to this Zilla Parishad.

Membrane Breakthroughs

From Hindustan Coca Cola, an ultra filtration system based on NORIT XIGA UF membranes. This will be the first ultra filtration system to treat process water, installed in a Coca Cola plant in India.

From Transgel Industries Ltd., Hyderabad, for their gelatin manufacturing facility coming up at Iran – a joint venture project between Transgel Industries and the Iran Government, an order for supply of an ion exchange system, capacity 5 m³/h with 5% w/v solution

for deashing of gelatine and a 6.5 m³/h ultra filtration system for gelatine concentration.

An order from Castrol, for oily waste water treatment using ultrafiltration. The system will use NORIT tubular UF membranes. These NORIT membranes are multi-tubular with almost 10 times membrane area; hence the plant will be not only much more compact in size but also about 50 per cent more economical.

Successfully Commissioned



At Gujarat Refinery, Vadodara – 3 x 250 m³/h auto demineralisation plant.



At Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (RRVUNL), Ramgarh, Jaisalmer, Rajasthan, a 2 x 30 m³/h demineralisation plant.

A 1400 dia. softener at Ruchi Foods, Chennai, for their vegetable oil refinery unit.

At Mohan Breweries Distilleries Ltd., Chennai, a 30 m³/h reverse osmosis plant.

At Sirpur Paper Mills, Sirpur, Khagaznagar, the fourth stream of demineralisation plant, capacity 75 m³/h.

At Chennai Petroleum Corporation Ltd. site, a one MLD pilot plant to treat refinery waste. The order, for supply of skid mounted reverse osmosis system and for rolling membranes at our Goa factory, was received from Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar.



A total water management system for Suzuki Metal India Ltd. at Manesar, Haryana – raw water treatment system of 64 m³/day, ultrafiltration 272 m³/day, reverse osmosis 256 m³/day, effluent treatment plant 280 m³/day, reverse osmosis 256 m³/day, and a 7 m³/day sludge handling unit.





A 50 m³/h effluent treatment plant using the C-Tech cyclic activated sludge process at Manav Breweries Pvt. Ltd., Bulandshahr, Ghaziabad, UP.



A reverse osmosis plant for West Bengal Chemicals Ltd.



Water treatment plant for 20 MW cogen unit of Shree Doodhganga Krishna Sahakari Sakhar Karkhane Niyamit, Dist. Belgaum, Karnataka.

Test Rig Inaugurated

At our speciality chemicals factory at Patancheru, Andhra Pradesh, Mr. S. Ramachandran, Vice President – Speciality Chemicals, inaugurated a unique pilot test rig which simulates the conditions of a cooling water system.

The cooling water test rig comprises a mini cooling tower, automated pH correction facility, deposit and biofilm monitors, baby boiler and test heat exchanger. The rig enables us to simulate



a customer's cooling water system parameters and upgrade the treatment programme, and to pre-test and evaluate new product applications and programmes to optimize treatment cost, so that customers are assured of the optimum treatment programme.



A plating effluent recycle plant at Sundaram Fasteners Ltd., Madurai, Tamil Nadu.

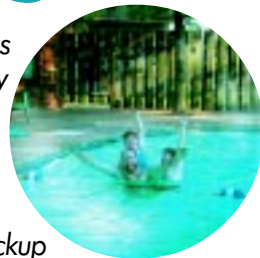
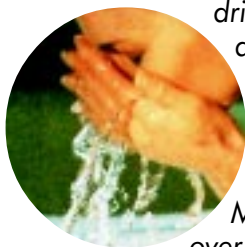
POWER BEHIND WATER



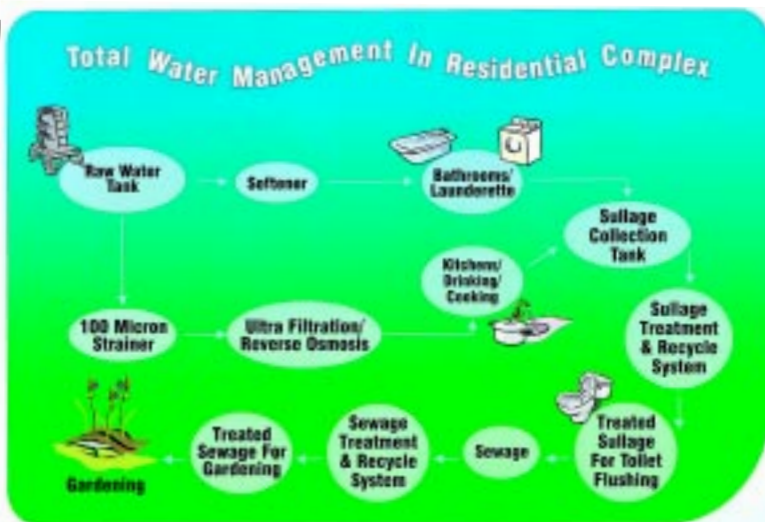
Total Water Solutions for Residential Complexes

Water management is a major challenge facing town planners, builders, architects and housing societies. The quality of water, particularly for drinking, is a critical concern on account of the increasing pollution of water supply sources, both surface and ground water.

against water shortage as well as assured quality of water for every use – from drinking and cooking, to bathing, laundry and air conditioning ...swimming pools and gardening... And for service backup



Moreover, many residential complexes suffer from inadequate water supply because of growing water scarcity. Indeed, water – its availability and quality – has become a key deciding factor in the purchase of a flat.



– such as annual maintenance contracts and O&M services by trained and experienced service personnel – that completely relieve societies of the hassles of operation, maintenance and supervision.



For residential complexes there is an urgent need for total solutions that provide assurance

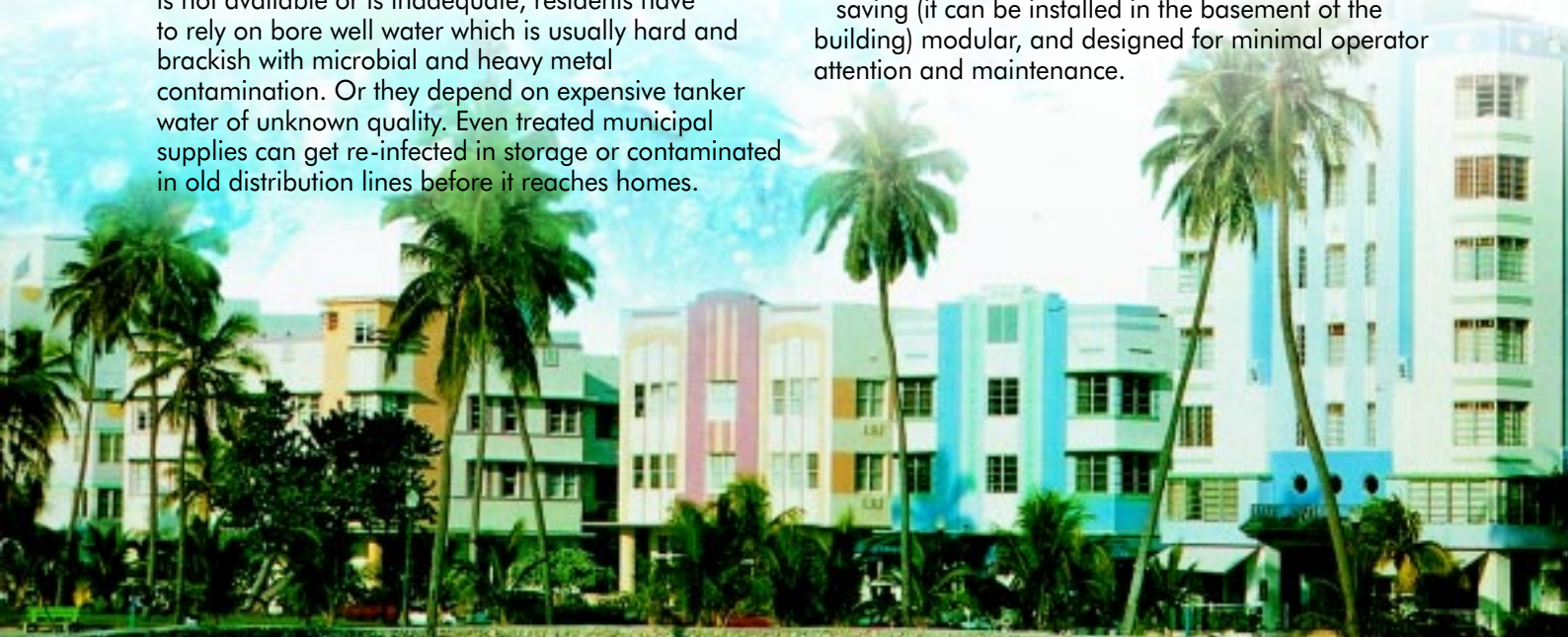
Safe Drinking Water

80% of diseases are waterborne. So when it comes to protecting health, it is important that residents get only the best quality drinking water. In many areas where piped treated water is not available or is inadequate, residents have to rely on bore well water which is usually hard and brackish with microbial and heavy metal contamination. Or they depend on expensive tanker water of unknown quality. Even treated municipal supplies can get re-infected in storage or contaminated in old distribution lines before it reaches homes.



Central Drinking Water Treatment System: This is a very effective solution to provide safe drinking water for the entire complex.

The system is simple and compact, yet effective and versatile enough to handle water from practically any source. Equipment is space saving (it can be installed in the basement of the building) modular, and designed for minimal operator attention and maintenance.



POWER BEHIND WATER



Water that's crystal clear and absolutely safe to drink... beverages and food also taste better!

INDIUM[®] Ultra Filtration/RO

- Removes all dissolved solids, harmful minerals and metals
- Removes bacteria and viruses
- Removes all undissolved contaminants like



suspended solids and colloidal particles
 • Also removes high molecular weight organic compounds



Water that's soft... for every day household needs.

INDIUM[®] Softener

- Reduces problems of hair loss, dry and dull skin
- Less detergent required for washing clothes
- Clothes resist fading and last longer
- No scum formation, scale and deposits in taps, pipes and showers
- Toilets, tubs and wash basins remain sparkling clean
- Prevents scale build-up in boilers and geysers –



more efficiency, less energy consumption, less maintenance, longer life



It consists typically of ultra filtration. In case the water received is brackish, then it is treated through a reverse osmosis (RO) unit. A softening unit can be incorporated to remove hardness to provide soft water for bathing and laundry. Treatment units specifically for removal of iron, arsenic, nitrates or fluoride can be incorporated in areas where these contaminants are present in ground water supplies.

Water Vending Stations: As an alternative to a central drinking water system, a water vending station may be installed so that individual flat owners can come and collect water in their containers.



Point-of-Use Products for Water Disinfection & Conditioning: Many residents are turning to the additional safety net of point-of-use drinking water purifiers. These offer high quality, good tasting water on demand and are available in a wide range to suit all budgets and needs.

Water conditioners are also available to treat problems of hardness and iron in water.



Zero B Pristine Counter Top Reverse Osmosis Purifier



Zero B Puriline On-line Purifier



Zero B Resiline On-line Purifier



Zero B Ultimate Iron Remover

Assurance against Water Shortages

A major problem facing most housing complexes is regular availability of piped water supplies, and many today are dependent on tanker water. With water supply getting more and more scarce, in future it will be difficult even for tankers to get their supplies.

Sullage Recycle Systems: Simple and cost-effective, sullage recycle is an effective answer to crippling water shortages. Besides residential complexes, these are also ideal for hotels, hospitals, commercial complexes, schools and colleges.

Waste water from kitchens and bathrooms (grey water or sullage) is treated and re-used for toilet flushing, gardening and other low-end uses. Sullage recycle thus reduces the requirement of fresh water by upto 60%; it makes more fresh water available for uses such as drinking, cooking, bathing and laundry while reducing dependence on unreliable and/or insufficient water supplies and drastically cutting down expense on tanker water.

Sullage recycle systems are compact, and easy to install, operate and maintain. The simple construction

POWER BEHIND WATER



and affordable capital cost make it easy for new and existing buildings to go in for the system and payback if often within a year.

Annual maintenance contracts too are available for trouble free operation of the system.

Packaged Sewage Treatment Plants: A unique system of outstanding performance and efficiency; treats sewage from the complex for re-use;

treated water can be used for gardening.

Membrane-based Bio-reactor Systems: are compact and very reliable. They remove bacteria and viruses and treat both sullage and sewage.

INDION New Generation Packaged Sewage Treatment Plant is ideal for housing complexes, townships, hotels and resorts.

Available in a modular range, this all-in-one system is compact and simple to operate and requires minimal maintenance. The advantages include minimal land usage, minimum power and chemical requirement, and low operating cost.



Rainwater Harvesting: In cities, rooftop rainwater harvesting is simple and less expensive to construct, operate and maintain. In saline or coastal areas, rainwater provides good quality water and when recharged to groundwater, helps to maintain the balance between the fresh-saline water interface.

As water scarcity increases, legislation, awareness and implementation of water conservation systems will gradually gain ground. Already, in several cities, sullage recycle and rainwater harvesting are mandatory for new, large size construction projects.

Symposium on Water Security



(L-R) Mr. Ajay Papat, Dr. L.U. Joshi, Mr. Rajesh Sharma and Mr. R.S. Rajan.



'Planning for Water Security: Emerging Trends & Technologies', a symposium convened by IEI on December 12, 2003, at Hotel Mandovi in Panaji, Goa, saw extremely good participation from all key companies in Goa.

Mr. R.S. Rajan, Vice President – Consumer Products, welcomed the participants. The keynote address by Chief Guest, Dr. L.U. Joshi, Chairman, Goa Pollution Control Board, was followed by a holistic perspective of the water crisis by Mr. Rajesh Sharma, our Managing Director, and an in-depth and informative presentation by Mr. Ajay Papat, Vice President – Corporate Marketing, on the emerging trends and technologies for water conservation.

Enthusiastic dialogue with incisive questions from the audience continued over cocktails and dinner – even the view of the glittering Mandovi River failed to divert the attention of the gathering from the core issue of water security.

Single Source Service Solutions



Customers are finding they gain an all-in-one package of benefits when they outsource our single-window services. Indeed, our total water management capability and comprehensive range of services enable us to create value across the entire supply chain, delivering to customers the end benefits economically and conveniently, with single-point responsibility.

Contracts for supply of plant including its O&M are saving customers expense, supervision and the hassle of maintaining facilities in-house, allowing them to focus on their core competencies. Refurbishment of existing water treatment plants increases efficiency at much less cost than installing a new plant. And as an increasing number of customers opt for outsourcing of services – a worldwide trend, IEI's investment, begun more than 15 years ago, in building an all-India service infrastructure, is serving us in good stead.

In a move to further extend our single window services across the utility spectrum, our service network recently launched a number of value added services (VAS), offered along with regular service contracts for water treatment plants. VAS include laboratory water analysis,

instrument calibration, pump servicing, tank cleaning and an easy lab kit for RO monitoring & membrane antiscalant services. The VAS package is yielding attractive benefits and savings to a growing number of customers.

Our service company network has assiduously built up a clientele of more than 6,500, with over 1,800 service contracts and more than 80 O&M contracts on hand, in addition to providing E&C and refurbishment services (our service business was extended to over 800 customers of other water treatment companies last year). Some of these contracts:

Refurbishment

Turnkey execution of refurbishment contract of 4 x 50 m³/h demineralisation plant at Kolaghat Thermal Power station of West Bengal Power Development Corporation.

Refurbishment including civil, electrical and mechanical work of 2 x 40 m³/h demineralisation and commissioning of 40 m³/h demineralisation plant for Bandel Thermal Power Station of West Bengal Power Development Corporation.

Annual Maintenance



For a 2 x 60 m³/h PLC based automatic demineralisation plant at Bakreshwar Thermal Power Station, West Bengal.

O&M



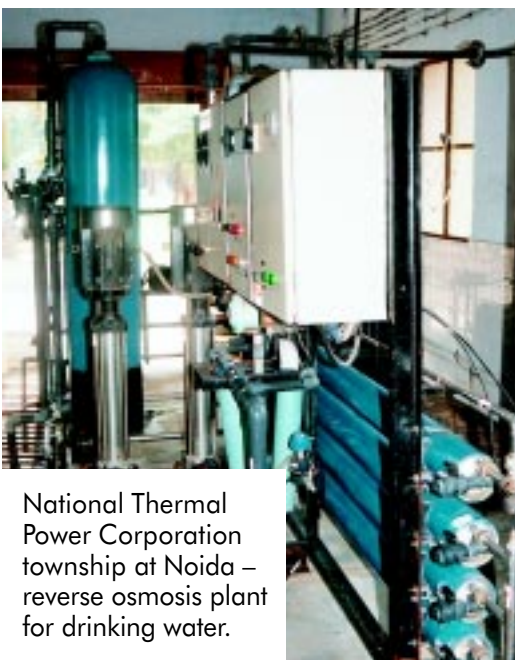
National Fertilisers Ltd., Noida – for the drinking water treatment plant – multigrade filters, reverse osmosis, ultra violet disinfection modules.

Ion Exchange Services (South) Ltd. was awarded ISO 9001:2000 certification while its analysis laboratory in Bangalore has been awarded National Accreditation Board Ltd. (NABL) certification.

Other O&M contracts include:



Times of India, Ghaziabad – multigrade filter, dosing system and reverse osmosis plant.



National Thermal Power Corporation township at Noida – reverse osmosis plant for drinking water.

Hindustan Times, Noida – multigrade filter, reverse osmosis unit for drinking water treatment and demineraliser for process water.



Tata Cummins Ltd. & Timken India Ltd., at Jamshedpur – pretreatment, reverse osmosis and effluent treatment plant (oily waste removal using ultra filtration).

Webel Solar Limited, Calcutta – demineralisation plant retrofitted with reverse osmosis.

Tata Iron and Steel Company, Jamshedpur – 2 x 40 m³/h PLC based automatic demineralisation plant, cooling water recirculation system and waste water treatment plant at the cold rolling mill.

Rail Neer packaged drinking water projects at Danapur, Bihar and Nangloi, near New Delhi.

Indian Army Command Hospital, Kolkata, for the reverse osmosis plant for the hospital's dialysis unit.

Samtel Colour Limited, Ghaziabad – renewal for a further two years of the O&M contract for the 60 m³/h effluent recycle (reverse osmosis) plant.

Bhilai Electric Supply Co. Ltd., Bhilai – extension of the O&M contract of the pretreatment plant, 3 x 100 m³/h demineralisation plant and monitoring of boiler water chemistry, for another year.

IBM Global Services – reverse osmosis plant.

Advanced Medical Research Institute, Kolkata – reverse osmosis plant for the hospital's dialysis unit.

FAREWELL

I first met Werner in 1963 at Permutit's Drawing Office in London. Owen Martin, who was primarily responsible for getting the London Board's approval for the establishment of the Indian subsidiary, introduced me saying that Werner would be coming out to India to set up our drawing office.

When Werner came over the next year I got him accommodated in Mumbai initially at the Cricket Club of India which had a few residential rooms and later, in a flat overlooking Brabourne Stadium. When the first seven or eight draughtsmen had been recruited along with a drawing office head, training started in the flat. (There was one important cricket match played in the stadium when Werner permitted the draughtsmen to watch part of it.)

The IEI Drawing Office started functioning, along with the rest of IEI staff, at J. Stone's office in Crescent House, Ballard Estate (now head office of L&T), and subsequently moved to Tiecicon House, Mahalaxmi, where J. Stone and IEI together shifted from Ballard Estate.

The foundation for IEI's Contracts Department was laid by Werner who also introduced the vital concept of standardisation. He helped in the design and field work involved in several contracts and contributed most valuably to setting out procedures and providing vital engineering information in detailed notes related to all aspects of the equipment we were designing. All of this has been invaluable in our business and training.

Werner had a sharp mind and was outspoken. He had a keen sense of humour too and discussed many subjects with me especially on the environment and made several useful suggestions regarding my monographs on water conservation. He helped promote export of Zero B to UK but we did not meet with much success although, for a while, Zero B Watermate was sold at Heathrow Airport, London.

Over the years my wife and I met Werner and his wife Elaine on several occasions in London and we visited his home too. They have a son and daughter both of whom are now married and have children.

All of us owe much to Werner Jonas for his advice and guidance. I am greatly saddened as I have lost a dear friend and have expressed to Mrs. Jonas and the family, the sense of loss all of us feel.

G.S. Ranganathan, Chairman, Ion Exchange India

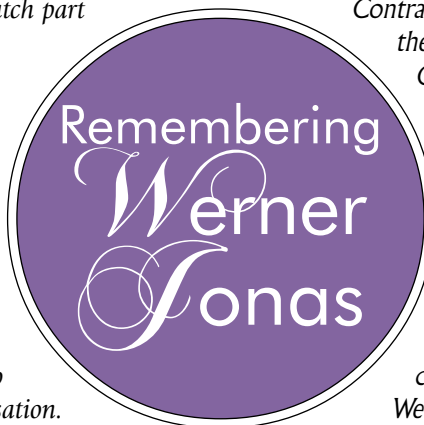


I was very sorry to hear about Werner's passing away. It was the development of IEI's engineering and design capabilities which propelled its phenomenal rise from a No. 3 position in the Indian industrial water treatment market in 1964 to the No.1 position by 1967. Werner Jonas stands out as the key man who moulded our Engineering Division in its formative years.

Werner came to IEI 40 years ago when he was deputed by Permutit UK to select design draughtsmen and set up our Design and Drawing office. He did a remarkable job of this challenging assignment in a short span of a 6 - 9 months' stay in Mumbai.

Besides contributing a wealth of valuable mechanical and engineering design data (which he had carefully collated at a personal level while working as a draughtsman and, later, as a Contract Engineer, with Permutit), he recorded these meticulously on Design Information Cards during his stay in India for easy retrieval and reference. He trained the draughtsmen and other engineers (including me) who came under his influence, in a new way of thinking, pausing to question every practice. He brought in a rational and systematic approach to plant design, beginning with layout optimisation to save costs without compromising value to the client.

Werner made many bold departures from some of the design practices of his home company. He was a strong advocate of standard blank drawings for plant components like pressure vessels, tanks, piping, etc. wherein the shape or form remains and only dimensions vary from unit to unit. These



Early days at Ambernath factory (mid '60s).



FAREWELL

standard drawings would obviously avoid repetition of a major part of drawing work from contract to contract. While this concept was well established in the 1950s, as I observed while working as a draughtsman in a British company manufacturing transformers in India, Permutit had been rejecting the idea in the 1960s either as impractical or in poor taste. Werner used these concepts in IEI.

Werner had a penchant for experimentation and the environment in IEI gave him an opportunity for self-expression which he did not enjoy in his home office. He brought a good deal of passion to his work and, while he sometimes went berserk with the propagation and implementation of his pet ideas and had to be moderated (severely), his sincerity was most disarming. He was open to rational counterview, corrections and compromise.

Werner was a complex personality, yet simple in many respects, warm and transparent. During his nine months'

Refineries – Contract 1000, way back in 1968. Werner came to Madras with Vivek Rao to visit this site. Vivek Rao, A. Parmeshwaran and I spent several evenings with Werner at his hotel over gin & tonic in a city that was then dry! I remember Werner as a very humorous person and one who was willing to share his very considerable knowledge about water treatment. I also realised after this meeting that IEI owed a lot to him for his support and all he did to help set up the company and get it going.

My next encounter with Werner was in the '90s when he visited Hosur to critically assess the way the Standard Plants Division functioned. I thought he was unduly harsh in his criticism but, although quite unhappy about being criticised, I realised that all the criticism was based on sheer common sense. Hosur decided to go in for ISO 9000 a couple of years later.

The process of working towards ISO certification made me realise just how relevant Werner's comments and suggestions had been. IEI has lost an old friend and well wisher and Werner deserves a prominent mention in IEI's history and archives.

S.S. Ranganathan, Managing Director,
Ion Exchange Services

I first met Werner Jonas at Madras in November 1970 when he came along with Mr. G.S. Ranganathan to the Madras Fertilizers site where I was the Commissioning Engineer. In later years, I had several occasions to meet him in India and in the UK. I also had an occasion to travel with him to the MSEB Chandrapur site and to Hosur.

I was not in IEI when Werner spent some six months in setting up the drawing office and in training the initial batch of design and drawing personnel on design of water treatment plants and project handling. In later years, when I had a lot to do with engineering, standardisation and computerisation, I could see how good the foundation built by Werner was.

Werner was a perfectionist and a person with a passion for standardisation. He believed that if something could be standardised, it should be. Although trained in the days of drawing boards and slide rules, he made the switchover to computers at a late age in life, apparently effortlessly. He had a sharp mind, observant eyes, a good memory for people and, above all, a fine wit. He had a knack of writing, compiling and editing and an excellent command over English.

I was sad to hear of Werner's death. May his soul rest in peace.

A.M. Joshi, ex-VP – Projects



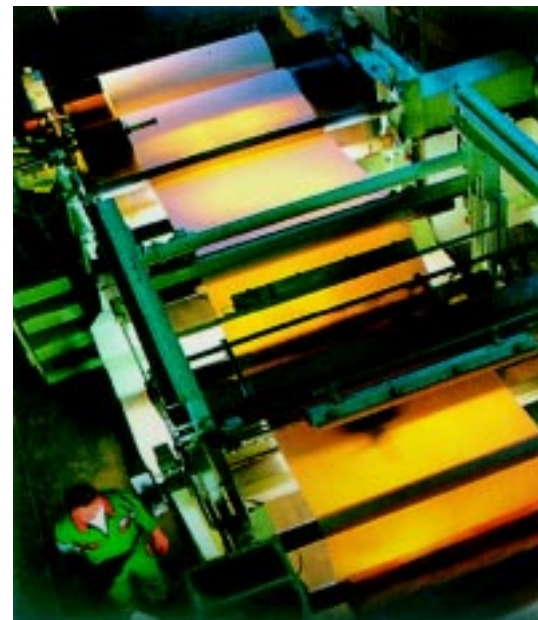
The Jonases in the '70s at their home in Boreham Woods.

stay in India, we shared a cabin in ICI House. He would, in the middle of nowhere, start talking about his children or the green grass of the English countryside. He was obviously homesick and would accompany me in the evenings to my apartment in Mahim. It was a great experience to travel with him on business. A pseudo-atheist, he loved discussing philosophy. He had a keen interest in politics and strong left-of-the-middle leanings. He spent a lot of time with me whenever I visited England and was a great help in locating new technologies and prospective business associates.

D.G. Rao, Director, Ion Exchange India

My first encounter with Werner was as part of the team that handled the first really large job IEI got – Madras

IEI in the Paper Industry



The art of writing is age-old. But the material used for writing on has undergone a transformation from stone surfaces and leaves used in ancient times, to the modern multi-variety and multi-purpose range of papers for packaging, writing and printing. Paper making is one of the largest agro-based industries; pulp made from raw material such as hard wood, grass, bagasse and bamboo is used in its manufacture, and, as such, the industry essentially revolves around two sections – pulp making and paper making.

Water Treatment

Paper making is a very water intensive process. In India, the water consumption in integrated pulp and paper mills is to the tune of 200 to 250 m³/ton of paper produced though it can be reduced to as low as 15 m³/ton in efficient paper mills. (Some mills in India use waste paper or ready pulp from other pulp mills.) Water consumption differs from mill to mill depending upon the manufacturing process and the amount of pulp manufactured; it is consumed mainly in the pulp mill, bleaching plant, paper machines, soda recovery sector and captive power plant.

Since paper mills require large volumes of water, they are usually located near water sources like rivers or lakes. The water required for various processes should be free from suspended impurities and it should not impart any colour. Part of the water is used as make-up for boilers for the captive power plant.

Process Chemicals

A wide range of chemical additives are used in paper manufacture. In the stock preparation section, after

the bleached pulp passes through the refiners, additives are added to it in a blending chest in which they get thoroughly mixed. Additives impart the required qualities of thickness, brightness and strength.

Effluent Treatment & Recycle

Effluents, generated from the pulp mill, bleaching plant, paper machines and soda recovery unit, contain pH, colour, COD, suspended solids, dissolved solids and odour.

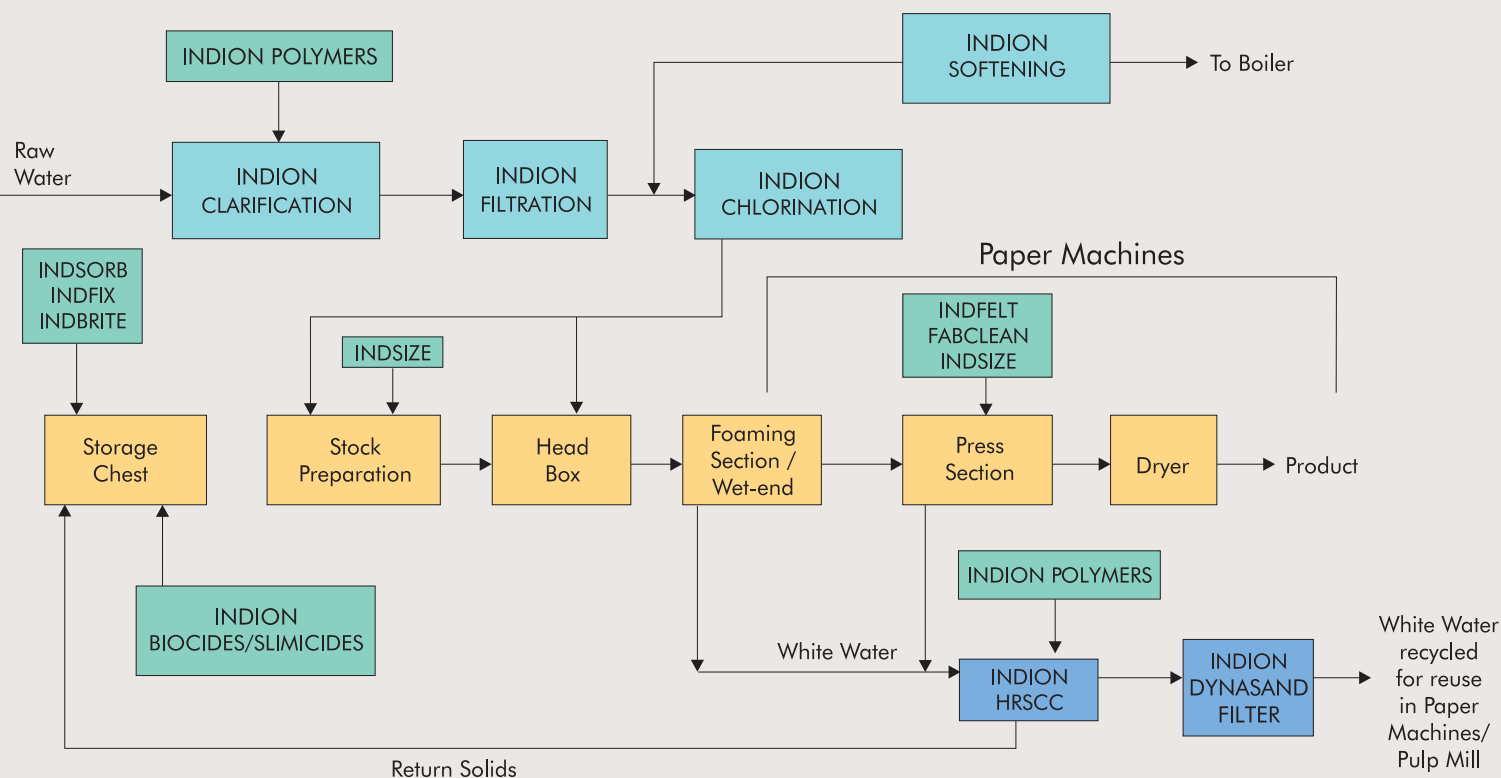
Cleaner production methods like *white water* recycle significantly reduce the water consumption in mills. After the stock is prepared, it is mixed with water to make a slurry and passed through a screen before it is sent to the paper machines. The water removed in the wire part of the machine – *white water*, is clarified. The bottom solids – fibres/fillers, are recovered and sent back to the stock chest for mixing with the prepared stock. The top water is recovered and used in the pulp mill or even in stock preparation.

The treated effluent from the pulp mills is generally high in terms of COD. The effluent is also coloured. The TDS and chloride levels usually just match or exceed the limit because of the high amounts of chlorine and hypochlorite used during bleaching. However pollution discharge norms and their enforcement are getting increasingly stringent and pulp and paper mills are gearing up to meet these.

Towards a Safer Environment

Apart from effluent treatment and recycle solutions offered by IEI, our INDSURF deinking applications allow for the successful reuse of old newspapers and office waste into new paper. Our metal precipitants, METASORB, clean waste streams of heavy metal contaminants. INDBRITE bleaching aids allow peroxide bleaching to be more effective as it replaces bleaching by chlorine. Developmental work continues on safer and more environmentally sensitive materials for microbiological growth control, increased use of effective chemical materials that contribute little or no organic halogens to mill effluent and deposit prevention/removal programmes that eliminate the need for obnoxious solvents.

IEI in the Paper Industry



IEI's Paper & Polymer Division

At IEI, we not only offer total water management solutions to the paper industry, but have also set up a separate division – the Paper & Polymer Division (PPD) – which caters to the process chemical requirements. The approach is to provide a solution rather than sell a product to the customer. For example, if a customer needs to develop a new grade of paper, our PPD jointly works with the customer's product development cell to achieve this objective, involving itself in the process by conducting various lab evaluations and plant scale trials, and sending the paper for evaluation to the end user. This partnering approach is based on PPD's firm belief that the success of its business depends on the success of its customers. Gearing itself to do this, the division has set up an application lab facility as well as an AKD sizing project, at Patancheru, Andhra Pradesh.

Application laboratory

This lab facility conducts application studies and tests on:

Process chemicals and programmes

- Retention and drainage aid programmes
- AKD package programmes
- Deinking chemicals
- Bleach enhancers
- Efficacy of dry strength resins
- Efficacy of slimicides

Water and waste water applications

- Raw water clarification
- De-water applications
- Colour removal applications



- SDI reduction
- Efficacy of defoamers

Application tests for process chemicals

- Evaluation of de-flocculants
- Evaluation of polymers for process applications like aluminium refining, zinc, titanium, iron and steel.

AKD Project

Sizing chemicals are of two types – the older acidic sizing and the alkaline sizing adopted by new mills, where alum and rosin are replaced by Alkyl Ketene Diemer (AKD) which can be directly fed into the fan pump or even at the inlet of the head box. The pH maintained is 7.0 - 8.0. The major advantages of alkaline sizing are no reversion of brightness of paper, excellent printability and good appearance.

Inaugurated on December 9, 2003, our AKD project was set up with the



Mr. G.S. Ranganathan, Chairman, inaugurates the AKD project. (inset) Mr. Sudip Sarkar, Head – Paper Division, welcomes the gathering.

aim of providing total solutions to the paper industry. With an installed capacity of 6,000 MT and operating capacity of 2,000 MT, the project was completed in a record 100 days. This project will enable the division to

Major Clientele in the Pulp & Paper Industry

- PT Riau Andalan Pulp & Paper Mills, Indonesia
- Indah Kiyat Pulp & Paper, Indonesia
- Andhra Pradesh Paper Mills Ltd., Rajamundhry, Andhra Pradesh
- Sesasayee Pulp & Paper Mills Ltd., Erode, Tamil Nadu
- ITC Bhadrachalam Paper Board Ltd., Andhra Pradesh
- Sirpur Paper Mills, Andhra Pradesh
- Pudumjee Pulp & Paper, Pune, Maharashtra
- Coastal Paper, Rajamundhry, Andhra Pradesh
- Triveni Tissues, Kolkata, West Bengal ...and many more

A Totality of Solutions

- Raw water treatment – clarification/filtration/disinfection
- Coagulants and flocculants for raw water treatment
- Demineralisation for captive power plant
- Cooling water treatment, softeners for make-up water requirement
- Biocides & slimicides
- Polymeric chemicals for imparting qualities to paper such as sizing chemicals, dry strength resins, brighteners, dispersants, deinking chemicals, dye fixatives, retention and drainage aids
- Waste water treatment – flocculants for improving sludge settling/consistency/sludge filterability
- White water recycle process and equipment



take charge of the wet end chemistry of the paper making process, taking it a step further towards its vision to become the number one paper chemical company in India.

The next immediate objectives that PPD has set for itself is to develop a micro particle system and new sizing packaging like ASA sizing for the paper industry.



Envirosave

✓ Reduce ✓ Reuse ✓ Recycle

We may like our paper plenty, white and bright – but let's give a thought to how we can recycle it to help protect the environment – saving energy, trees and water.



- Every fifth tree worldwide is used to make paper.
- Making paper uses a lot of energy; producing a tonne of paper requires the same energy as producing a tonne of steel.

- New paper is often white, not because this is its natural colour but because it is bleached. The bleach used in making white pulp can cause appalling water pollution.
- Currently, more than half of all paper used is still thrown away – less than 50% is recycled.

Recycling paper

Protects the environment

- Recycling paper saves natural resources. One metric tonne of recycled paper saves 17 trees, 20,000 litres of water and the equivalent of 1,000 litres of petrol.
- The manufacture of recycled paper uses 50% less energy and water than in making new paper.



Reduces the volume of waste to be processed

- Recovering used paper separately helps reduce the amount of waste that is processed.

Where do we start?

At Work



- Print or copy on both sides.
- Make fewer copies. Share or circulate copies. Do not make more copies than required.

- Proof documents on screen and preview before printing.
- Use electronic and voice mail.



- Whenever possible avoid the use of envelopes (fold and staple the paper).
- Reuse envelopes for postal mail by placing a label over the old address.



- Reuse envelopes for interoffice mail.
- Post announcements on bulletin boards.
- Collect paper that has been used on one side and reuse it for drafts, in fax machines, for scratch pads and photo copies (in copiers

with multiple trays, one tray can be stocked with such paper).

- Use outdated letterheads for in-house memos.
- Shred newspapers and reuse for packaging.

At Home

- Write on both sides of every sheet of paper.
- Make rough pads with all the blank sheets from old notebooks.
- Ensure that every scrap of used paper in the house is sold. Even bills, used brown paper covers, used envelopes, hand bills, old diaries and calendars should be sold to the kabadiwala.
- Use a slate for doing rough work, taking messages, keeping lists, etc.
- Store and reuse paper bags.



Recycling paper cuts down waste and conserves natural resources, enabling each of us to do our bit for the environment, at home and at work.

HAPPENINGS

Jal Tarang

A kaleidoscopic variety entertainment programme of song, dance, mimicry, skits and fancy dress showcased the multi-faceted talents of the IEI

family. A spirit of togetherness and camaraderie, so characteristic of IEI's culture, marked this gathering where everyone intermingled and got to know each

other's families better. The highlight of the evening was the long service award ceremony where long servers were honoured and felicitated for their dedication and loyal service to the company. 'Champion Team' and 'Man of the Match' awards were also presented for the IEI cricket matches held recently. All in all, a truly memorable evening.

WELCOME TO
Jaltarang
ION EXCHANGE (INDIA) LIMITED
FAMILY GET-TOGETHER



 **ION EXCHANGE**
THE POWER
BEHIND WATER (INDIA) LTD
Total Water Management