

Professional Work Experience Profile
Of
Homi R. Mullan
Consultant: Energy & Environment Management



23, Suraj Apartment
274, Jaoji Dadaji (Tardeo) Road
Mumbai 700 007
Tel. 91-22-23865290
Cell. +919820811308
E-mail: mullan.hts@gmail.com
Website: www.mullanconsultants.com

October 12, 2011

Table of Contents

| Section | Page# |
|--|----------|
| 1.0 Preamble | 3 |
| 2.0 Professional Courses & Training | 4 |
| 3.0 First Time Successful Launches Of Innovative Products | 6 |
| 4.0 First Multi-Products Sale Packages On Projects | 7 |
| 5.0 Current & Future Perspective | 8 |
| <i><u>Additional</u></i> | |
| 6.0 Specialisation In The Field Of Hospital Infectious Waste Management, Handling, Treatment & Disposal | 9 |

1.0 Preamble

Homi R. Mullan, B.Sc. (Physics & Mathematics), career started in 1963 with on-job training with Learning and Specializing in Efficient Use of Steam for Process Heating and Temperature Maintenance applications. Encompassing around it, Specialisation was achieved in Energy Conservation, Temperature and Pressure Control & Monitoring Instruments. In larger context, the specialisation evolved from the point of Process Steam Generation, involving Steam Boilers, Heating of Oil Storage, Transfer and Combustion Heating Equipments. Further in Distribution of Steam to Process Plants, involving Design, Engineering and Installation of Steam Distribution and Condensate Return network Pipes, Steam Trapping & Air Venting, Pressure, Safety & Stop Valves; including Thermal Insulation Design, Estimation and Application. In addition to this, Specialisation in the field of Process, Environment Monitoring & Control Instrumentation was achieved, dealing with parameters of Combustion Efficiency (CO₂ / O₂) stack monitoring, pH, Conductivity, and, also in the Field of Cardiac Care Electro Medical Instruments. After 15-years of experience in these fields towards Technical Selling & Marketing, Managing Branch Sales Office at New Delhi and later in Mumbai, a paradigm shift took place in 1978 into another area of Marketing of Emerging Technologies of Polymer usage in Electrical Engineering Field, offering Engineered Solutions to the Process, Oil & Gas, Refineries, Power Plants, Steel Plant industries, with Raychem Corporation, Menlo Park, CA, with its India Subsidiary.

The next 10-years that followed had involvement in a Revolutionary Change in the Introduction, Usage and Establishing a Market in India of Self Limiting Self Regulating (SLSR) Electric Heat Tracer *AutoTrace™* (Chemlex / Raychem) over conventional Steam Tracing in Industrial Processing application needs, mainly for handling, transferring and storage of paraffin content Waxy Crude and, Waxy High Pour Point (55°C) fuel oils. Prior experiences in Process Steam Engineering, Industrial Markets, Technical Marketing and Sales Management enabled in formation of a Team, a Market in establishing a Business and a Division of Electric Heat Tracing in India, that is still a growing business today in India, even after 32-years of initial introduction. During these years with Raychem, Homi Mullan established a market for their multi-products to the Industries in India in a big way. Introduction to these Industrial markets included the products such as: Heat Shrink Thermal Insulation Cladding, ThermaClad™; Flame Retardant Speciality Instrumentation & Control cables; Heat Shrink Pipeline Corrosion Protection Coatings; and, subsequently in formation of a Heat Tracing company, XICON in 1986 till 1988, to Service Raychem's Electric Heat Tracing business.

Next 12-years till 2000, that followed, worked in an entrepreneurial capacity and dealt and specialised fields to promote: a) Hydrocarbon Fire Protective Coatings for weight bearing structures; b) Hospital Infectious Waste Management, handling and Disposal technologies; c) Incineration technology; d) Oil Spill Response Equipment and Technologies (Skimmers / Floating Booms & Curtains); d) Consulting Service in the field of Electric Heat Tracing Marketing support to Raychem RPG in 1993, and later with Thermon India in 1999, for Training, Project Studies, Project Management, Technical Representation in Customs & Excise cases.

Subsequent 5-years (2001 to 2005) worked with a community Trust (325-years old) Bombay Parsi Punchayet, as an Administrator, and later as a Senior Executive, Estates, heading a department handling 4,500 tenements Facility Management, Property Management and Legal aspects, holding a Power of Attorney for and behalf of the Board of Trustees. During this period, Homi Mullan provided Heat Tracing marketing support to Thermon India.

Later worked as full time on Contract with Thermon Heat Tracers Pvt. Ltd., India, a Subsidiary of Thermon, San Marcos, Texas, USA, from July 2006 to December 2007; extending support to Sales, Design & Engineering Team in Electric & Steam Heat Tracing, Projects Execution, and in preparation of Technical Notes & Studies.

Worked full time on Contract with Raychem RPG Pvt. Ltd., a R P Goenka Group Company, from January 2008 to July 2011, during the Contract Term Period; extending support to Sales, Design & Engineering Team in Electric Heat Tracing, Projects Execution, and in preparation of Technical Notes & Studies.

2.0 Professional Courses & Training

- Efficient Use of Steam, Comp. Air & Process Control Instrumentation; Technical Selling – 1963 (*at, J. N. Marshall Ltd., Pune, India*)
 - Steam for Process, and Compressed Air Systems – 1975
(*at, Spirax-Sarco Ltd., Cheltenham, U.K.*)
 - Industrial Process Control & Bio-medical Instrumentation – 1975
(*at, Cambridge Instruments Ltd., Cambridge, U.K.*)
 - Water and Air Pollution Monitoring & Control Instrumentation – 1975
(*at, Electronic Instruments Ltd., Surrey, U.K.*)
 - Steam & Electric Heat Tracing Meeting - 1979
(*at, Chemelex, Paris, France*)
- Speciality Polymers for High Voltage Insulation, Technical Sales Training Course – 1979
(*at, Raychem Corporation, Menlo Park, California, U.S.A*)
 - Professional Skills II – 1979
(*at, Xerox Corporation, Menlo Park California, U.S.A.*)
 - Post Graduate Training Programme – 1982
(*at, Raychem Corporation, Menlo Park, California, U.S.A*)
- Crossed-linked Polymers for Electronics and Wires & Cables – 1983
(*at, Raychem Corporation, Swindon, U.K.*)
 - Crossed-linked Polymers for Corrosion Protection – 1984
(*at, Raychem Corporation, Brussels, Belgium*)
 - Electric Heat Tracing & Controls – 1987
(*at, Heat Trace Ltd., Stockport, Cheshire, U.K.*)
- Hydrocarbon Fire Protective Coatings for Weight Bearing Structures – 1988
(*at, PPG Industries, Pittsburgh, Pennsylvania, U.S.A;& HAT Contracting, U.K.*)
 - High Temperature Incinerators & Oil Spill Skimmers – 1998
(*at, Elastic, Inc., Carmi, Illinois, U.S.A.*)
 - Oil Spill Response Systems – 1998
(*at, American Marine, Inc., Cocoa, Florida, U.S.A.*)
- Healthcare Waste Management System Survey and Study – 1998
(*at, Hospitals in Houston and in Chicago, U.S.A..*)

- Hospital Clinical Waste Management – April 12-15, 2000
(at, Indian Society of Health Administration, Bangalore)
- National Meeting on Environment & Health – February 25-27, 2002
(at, Indian Society of Health Administration, Bangalore) s
- Hospital Clinical Waste Hazards Management & Infection Control – October 14-19, 2004
(at, Indian Society of Health Administration, Chennai)
 - IDC Master Class – March 7-8, 2008
(at, Tyco Thermal Controls, Mumbai, On Aspects of Heating Technology & Controls)
 - University 201 – October 4-7, 2010
(at, Tyco Thermal Controls, Hyderabad, On Heat Management Systems & Controls)

3.0 First Time Successful Launches of Innovative Products

The following Innovative Industrial Products were launched in India, replacing Conventional Established Practices and Products.

- i) Thermodynamic Steam Traps (Spirax), replacing Mechanical range of Steam traps.
- ii) Diaphragm & Pilot operated Steam Pressure Reducing valves (Spirax).
- iii) Conversion / Augmenting of Bagasse Fired Boilers with Oil Fired Burners, in Sugar Industry, meeting Steam demands during low-crushing and off-crushing season stem demand (Clyde).
- iv) Battery operated Portable Electro Cardiograph machines (Cambridge).
- v) Worked on First of the Low Sulphur Heavy Stock (LSHS) fuel oil promotion program of the Marketing division of the Oil Companies (Indian Oil Corp. / Hindustan Petroleum Cor. / Bharat Petroleum Corp.), offering Temperature Maintenance Solutions and training to their field engineers, initially with Steam Tracing, and subsequently with Self Limiting Self Regulating Electric Heat Tracing (Chemelex / Raychem).
- vi) Introduction, Marketing, Selling and Establishing of Electric Heat Tracing (EHT) to Indian Industries with Self-Limiting Self-Regulating EHT, AutoTrace™, over Steam Tracing, (Chemelex / Raychem).
- vii) The First Power Plant project in India of Tata's 500MW installing Self Limiting Self Regulating Electric Heat Tracing in preference to Steam Tracing. This has become a Trend thereafter.
- viii) The First Oil Refinery project in India of Hindustan Petroleum Corporation's Visakhapatnam Refinery (VREP-I) installing Self Limiting Self Regulating Electric Heat Tracing in preference to Steam Tracing. This has become a Trend thereafter.
- ix) The First Oil Refinery in India of Bharat Petroleum Corporation's Mumbai Refinery Replacing Steam Tracing with Self Limiting Self Regulating Electric Heat Tracing in big way. This set the Trend for other Refineries in India, thereafter.
- x) Down Hole Oil Heaters for On-shore Oil production wells, at ONGC, Mehsana; and Oil India Ltd., Assam
- xi) Instrumentation & Control Cables of Radiation Cross-linked, dual wall insulation, Fire Retardant Low Smoke type, Spec 44™, to Power Station, (Raychem).
- xii) Heat Shrink Radiation Cross-linked weather barrier for thermal Insulation protection, ThermaClad™, (Raychem).
- xiii) Hospital Infectious Waste Disposal Incinerators, Electric and Oil fired.

4.0 First Multi-Products Sale Packages on Projects

- a) Tata Power's First 500 MW Power Project in India, opted for Raychem's emerging technology products consisting of:
 - Self Limiting Self Regulating Electric Heat Tracing
 - Spec44™ Radiation Cross Linked, Dual wall insulation, Low Smoke Fire Retardant Instrument & Control cables.
 - Heat Shrink Radiation Cross Linked Cable Terminations for Low, Medium & High Voltages.
 - Thermofit™ Radiation Cross Linked Heat Shrink Computerised Wire Identification marking sleeves.

- b) State Trading Corporation's First 12" diameter 3.5 Km Buried Heated Insulated Palm Oil Line from Indira Docks to Sewri Storage Terminal , with Engineers India Limited as Consultants, opted for Raychem's emerging technology products as a Total Reliability Solution, installing products such as:
 - Heat Shrink Radiation Cross Linked Corrosion Protective Coating over Pipe.
 - Self Limiting Self regulating electric Heat Tracers.
 - Heat Shrink Radiation Cross Linked Thermal Insulation protective cladding ThermaClad™ .
 - Dual Wall construction Cathodic Protection system Cables Anode cables and Anode caps.

5.0 Current & Future Perspective

With current hectic and Creative activity, having total involvement encompassing areas in supporting of Industrial Products Sales by way of Preparation of Tender Packages; Design & Engineering solutions; Training; Project Execution Site Visits, Technical Papers Preparation & Presentation, and possessing Specialised Knowledge and Experience in the Fields of Energy & Environment Conservation, Infectious & Hazardous Waste Management, spanned over **48-years**, Homi Mullan has a lot to offer to Progressive Companies, seeking to grow with the massive Industrialisations and Environment Modernisation Growth taking place at a fast pace in India.

6.0 Specialisation in the Field of Hospital Infectious Waste Management, Handling, Treatment & Disposal

YEARS OF EXPERIENCE

Involved with Hospital Waste Handling & Disposal System (Incineration) since September 1993.

SURVEYS

1. Hospital Survey to study Waste Management at Hospitals in U.S.A: a) **Memorial Hospital**, Memorial City, **Houston, Texas**; b) **Holy Family Medical Center / Spectra Services**, Des Plaines, **Chicago, Illinois**.- **1998**
2. Waste Estimation Surveys and recommendation for Incinerator capacity at hospitals in Mumbai: a) B. D. Petit Parsee General hospital; b) Harkisondas hospital; c) Jaslok Hospital.
3. Hospital Waste disposal Incinerator installation operation and waste handling system inspection survey with a team of Engineers from Brihanmumbai Municipal Corporation (BMC) at Hospitals in Bangalore: a) Victoria Hospital; KIMS Hospital; c) Bowring & Lady Curzon Hospital; d) J.S.S. Hospital, Mysore; e) Dr. B. R. Ambedkar Hospital.
4. Survey of Hospital and Bio-medical waste Incinerators at:
MUMBAI: a) J. J. Hospital; b) T.B. Hospital; c) Rat incinerator of BMC at Haffkine Institute; d) Cama & Albless; e) Hinduja Hospital.
DELHI: a) R.B. T. B. Hospital; b) Infectious Diseases Hospital; Lok Nayak Hospital, Apollo Hospital
COCHIN: a) Naval Hospital; b) Naval colony.
VISAKHAPATNAM: a) Vizag Steel Ltd. Hospital; b) Naval Hospital.
5. Pre-proposal Survey and submission of Reports of 'Medical Waste Management Study' for Maharashtra Health Systems Development Project (MHSDP), under IDA Credit No.3149 IN. Surveys conducted at Four District Hospitals, as I was one of the approved shortlisted Consultant. Hospitals surveyed for study were at: Nashik, Kolhapur, Satara and Ulhasnagar.

STUDY PAPERS WRITTEN:

1. "Comparative Study on Energy for Oil Fired Incinerators and Electric Incinerators".
2. "Understanding & Management of Dioxin Emissions from Medical Waste Incinerators". Ref:MWI-01, March 1997
3. "Understanding & Management of Efficacy Testing Criteria for Potentially Infectious Medical Waste Treatment Processes". Ref: MWI-02, May 1997
4. "Summary of Extracts from Final Rule (August 15, 1997) and comments on US Environment Protection Agency document 40 CFR Part 60; 6560-P related to 'standards of Performance for New stationery Sources and Emission Guidelines for Existing Sources: Hospital / Medical / Infectious Waste Incinerators. FINAL RULE".
5. Post-conference Comments on 'Bio-Medical (Management and Handling) Rules, 1998, MoEF notification dated 20th July 1998, The Gazette of India No. 460'.
6. "Planning & Selection Guidelines Hospital Medical Infectious Waste Incinerators (HMIWI)."

7. "Indian Perspective of Hospital / Medical / Infectious Waste INCINERATOR Operation Drawbacks and Suggested Corrective Measures". Paper presented at 'National Workshop on Hospital Waste Management' at New Delhi; Organised by International Development Centre, in collaboration with 'Centre For Occupational & Environmental Health, Lok Nayak Hospital'.
8. "Epidemiology of Hazards of diseases Transmission Risks with Bio-medical Waste in comparison with Municipal Solid Waste, and the related Universal Precautions". Paper presented at 'National Workshop on Hospital Waste Management' at New Delhi; Organised by International Development Centre, in collaboration with 'Centre for Occupational & Environmental Health, Lok Nayak Hospital'.
9. "Epidemiology of Hazards of Disease Transmission" at 2nd National Seminar on 'Hospital Clinical waste, Hazards Management, and Infection Control' at Institute of Health Administrators (ISHA), Bangalore.
10. "Issues in Medical Waste Management", at the Training Programme on 'Management of Biomedical Wastes', Sponsored by Ministry of Environment and Forests, and Organised by, Centre for Environmental Science and Engineering. Indian Institute of Technology, Bombay. May 8th to 10th, 2001
11. "Issues and Concerns Towards Safe Management of Health Care / Hospital Waste – History and Future Horizon", at 'Indian Society of Hospital Waste Management', First Annual Conference – May 25th 26th, 2001, Bangalore.
12. "Nosocomial Legionnaires' Disease: An Engineering and Integrated Approach Solutions for Prevention – associated with Building Water Systems, at National Meeting on Environment and Health in India, February 25, 26 & 27, 2002, at 'Indian Society of Health Administrators', Bangalore.
13. "Bio-Medical Wastes Disposal Systems- Understanding Criteria and Analysis for Comparative Selection",
14. Conducted a Teaching Programme & Seminar, as a Faculty Member, on "Hospital Clinical Waste, Hazards Management, and Infection Control", organized and conducted by 'Indian Society of Health Administrators', from October 14-16, 2004, at SRMC&RI, Annexe, Porur, Chennai, Tamil Nadu.
15. Conducted a Teaching Programme & Seminar, as a Faculty Member, on "Hospital Clinical Waste, Hazards Management, and Infection Control", organized and conducted by 'Indian Society of Health Administrators', from November 16-18, 2004, at St. Johns Academy of Medical Sciences, Bangalore, Karnataka.
16. Contributed Chapters II, XII and XXXII in the book titled 'Hospital Clinical Waste, Hazards Management, and Infection Control', authored Dr. Ashok Sahni, Professor and Hon. Executive Director Indian Society of Health Administrators.

DESIGN & ENGINEERING STUDY

1. Volumetric and Weight estimation approach for waste quantity determination in a hospital.
2. An approach to Medical Waste Management Plan for a hospital.
3. Criteria for On-site and off-site Treatment and Disposal facility.
4. Medical Waste Tracking approach and requirements.
5. Methods and Risks involved in treatment and disposal of Syringe Needles, with several different practices.
6. Design Review of Hospital Waste Incinerator Combustion Chamber Volume & Grate Area requirement.
7. Design and Review of Wet Scrubber and Dry Scrubber systems for Hospital Waste Incinerators.
8. Fault analysis and repairs of Oil fired and Electric Incinerators.
9. Energy Efficiency comparison between Electric Vs Oil fired Incinerators.
10. Efficient Steam Utilisation for Steam heated Autoclaves.

DOCUMENT STUDY

1. US Environment Protection Agency (USEPA) publication on Managing & Tracking Medical Waste, Medical Waste Incinerator; Alternate Technologies on Medical Waste Treatment & Disposal, National Dioxin Emission from Medical waste Incinerators, and Guide to Waste Minimization in Selected Hospital Waste Streams Hospital waste Streams.

2. Handbooks on: Hazardous emission from Incinerators, Designing of Dry Scrubbers and Wet Scrubbers, National Air quality Standards, Medical Waste Management, Medical Waste Disposal, and Toxicity in perspective- Dioxin (TCDD).
3. World Health Organization studies on Medical Waste Management in Developing Countries, and British Medical Association book on Hazardous Waste and Human Health.
4. Study of Standards on handling, Storage, Treatment, Transportation and Disposal of Medical / Clinical / Infectious Waste: a) Her Majesty's Inspectorate of Pollution EPA 1990, Process Guidance Note IPR 5/2. b) Pollution Control Board, Illinois, USA, Part 1420, 1421 & 1422, Potentially Infectious Medical Waste. c) US EPA document 40 CFR Part 60, HMIWI. d) Central Pollution Control Board guidelines, Delhi and Ministry of Environment and Forest Notification on Bio-Medical Waste (Management & Handling).
5. Handbooks & scientific articles on Chlorinated Organic Micropollutants, Waste Incineration and the Environment, Waste Incineration Handbook, Air pollution controls, and, Issues in Medical Waste Management.

TRAINING

Training lecture conducted on Medical Waste Management at:

1. Grant Medical College (J. J. Group of Hospitals), Preventive & Social Medicine department.
2. G. T Hospital (J. J. Group of Hospitals), Mumbai.
3. K. E. M. Hospital, Pune
4. Centre for Environmental Science and Engineering, Indian Institute of Technology, Bombay.