ALM SYSTEMS
People. Technology. Sustainability.

OUR TESTIMONY OF IMPACTFUL EFFORTS

ACCURATE MEASUREMENT → SUSTAINABLE WATER MANAGEMENT

INDUSTRY SPECIFIC

MUNICIPAL WATER SYSTEMS
METERING CONCEPT DESIGN
RIVER FLOW MONITORING

MUNICIPAL WASTEWATER SYSTEMS
IRRIGATION – TREATED WATER REUSE

POWER INDUSTRY

PROCESS INDUSTRY

KEY CLIENT REFERENCES

32 Cases Where Our Contribution Made A Positive Environment Impact In Our Country.

Note: Due to confidentiality reasons, the name of cities, towns, municipal corporations and other locations are not explicitly mentioned. Such details can be made available with client concurrence, if required.

14

Impactful Projects

MUNICIPAL WATER SYSTEMS

VARIOUS MUNICIPAL WATER SYSTEMS – BENEFITS GAINED FROM FLOW STUDIES / WATER AUDITS

1

- ❑ Identifying hitherto unknown multiple sources.
- ❑ 2.5 m Diameter pipeline.
- ❑ Reverse flow in the line.

2

AMRUT City 1:

- ❑ Identified more than 45% of transmission loss.

3

AMRUT City 2:

- ❑ Very low flow velocities.
- ❑ Low signal strength.
- ❑ Indicating sedimentation in pipeline.

4

AMRUT City 3:

- ❑ Identified more than 50% of transmission system loss.

5

AMRUT City 4:

- ❑ Identified more than 60% of transmission system loss.

6

Town 1:

- ❑ With water consumption between 10 to 20 MLD, we identified more than 50% of transmission system loss.

VARIOUS MUNICIPAL WATER NETWORKS – BENEFITS GAINED FROM FLOW STUDY / WATER AUDIT

7

Town 2:

- With water consumption between 10 to 20 MLD, we identified more than 40% of transmission system loss.

8

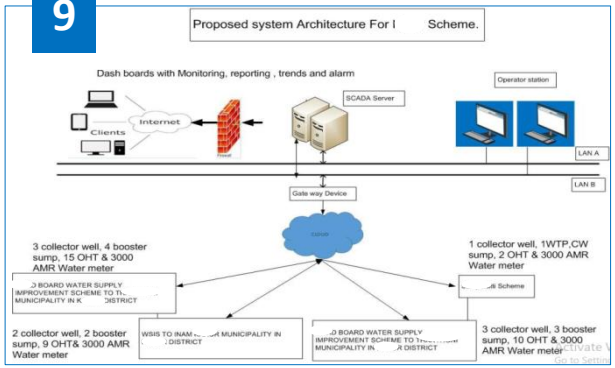
District Metering Areas (DMAs) (under Smart City Mission):

- 24X7 monitoring for quantifying consumption and losses.
- Helped for future demand estimation.
- Differentiated non-operational pipelines from operational.

WATER & ENVIRONMENT

METERING CONCEPTS DESIGN & IMPLEMENTATION

9



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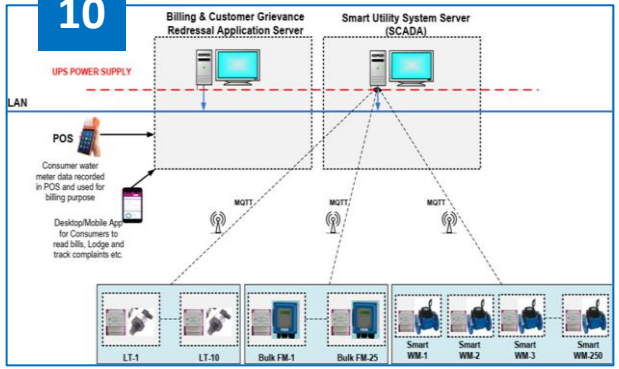

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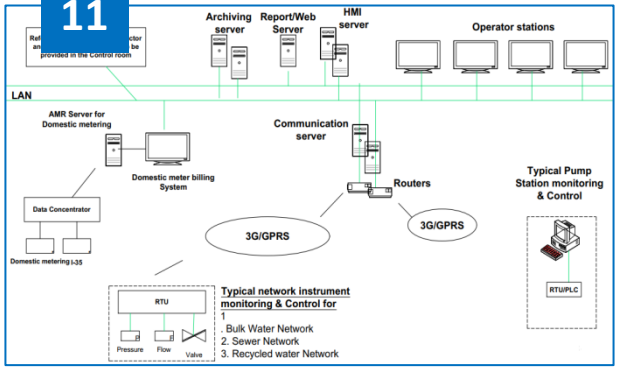
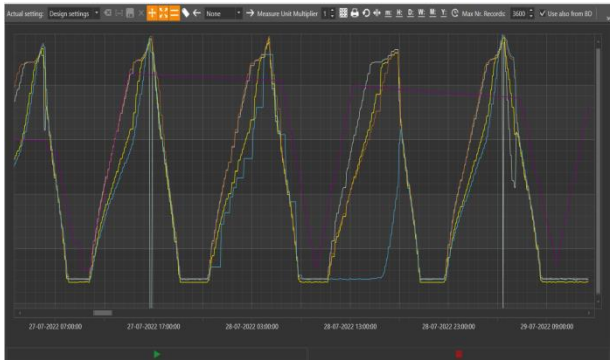


Developing A Metering System Which Is Aimed For Continuous Online Assessment Of Non-Revenue Water In 3 Towns.



RIVER FLOW MONITORING

12

River Flow Monitoring:

- ❑ One year study on potential of the river as an alternative energy source.
- ❑ Continuous Monitoring, Report & Documentation services.

13

Flow Monitoring For River Basin Management And Studies.

14

Flow Monitoring At 115 Locations For River Front Development.

WATER & ENVIRONMENT

13

Impactful Projects

MUNICIPAL WASTEWATER SYSTEMS

VARIOUS MUNICIPAL WASTEWATER SYSTEMS – BENEFITS GAINED FROM FLOW STUDIES

15

City 1 - Open Sewage Discharge Into River, Multiple Measurements Under A City-wide Wastewater Discharge Monitoring Scheme:

- ❑ For the purpose of river front development.
- ❑ Wastewater generated was 35% to 40% higher than the expected value.

16

City 2 - Open Sewage Discharge Into River, Multiple Measurements Under A City-wide Wastewater Discharge Monitoring Scheme:

- ❑ The rate of generation of wastewater was in excess of expectation.

17

Verification Of Existing Meter At STP Inlet:

- ❑ Observed more than 15% measurement error.

18

Municipal Corporation 1 - STP Sewage Inflow Survey:

- ❑ Identified 150% to 200% excess inflow than designed plant capacity.

19

Municipal Corporation 2 - Sewage Flow Quantification For New STP Design:

- ❑ Recorded particularly higher flow values around midnight.

20

Municipal Corporation 3 - Sewage Flow Survey.

VARIOUS MUNICIPAL WASTEWATER SYSTEMS – BENEFITS GAINED FROM FLOW STUDIES

21

Flow Measurement Of Sewage Discharges Through Various Tributaries Into A Major River In North India.

22

Quantification Of Wastewater Discharges Into Lake.

23

Volume Compilation Of Wastewater Discharges Into Pond.

24

Flow Study On Wastewater Discharge Into The Environment.

WATER & ENVIRONMENT

IRRIGATION – TREATED WATER REUSE (Comprehensive Study of 4 STPs)

25

Accurate Measurement (About 300 MLD) Of The Treated Water Inflow For Irrigation At Farm Areas, Above 50 Kilometers From The STP Sources.

26

STP 1 - Performance Verification Of Existing Meter At STP Inlet & Outlet:

- ❑ Identified more than 25% and nearly 10% measurement errors at inlet and outlet respectively.

27

STP 2 - Performance Verification Of Existing Meter At STP Inlet & Outlet:

- ❑ Identified errors .
- ❑ Inadequate plant performance due to excessive inflows higher than the design capacity of the plant, was observed and the plant performance was not optimum.

WATER & ENVIRONMENT

POWER INDUSTRY

03

Impactful Projects

POWER INDUSTRY – FLOW MEASUREMENTS

28

29

30

Three Applications With Three Different Technologies With Zero Compromise In Accuracy.

- Hydroelectric power station penstock.
- Flow metering for the purpose of monitoring hydraulic turbine efficiency – Case 1.
- Non-intrusive multi-path flow measurement using ultrasonic clamp-on sensors.

- Hydroelectric power station penstock.
- Flow metering for the purpose of monitoring hydraulic turbine efficiency – Case 2.
- Two path penstock flow measurement using inside pipe transit-time sensors.

- Thermal power station – open channel non-contact radar flow measurement system.
- Cooling water system usage assessment.

WATER & ENVIRONMENT

PROCESS INDUSTRY

02

Impactful Projects

PROCESS INDUSTRY – FLOW MEASUREMENTS

31

Quantifying Wastewater Discharge Towards Achieving Zero Liquid Discharge (ZLD) Targets For Steel Plant.

32

Water Audit Services For Verification And Calibration Of Existing Flow Meters.

KEY CLIENT REFERENCES

11

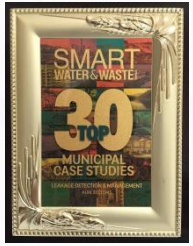
Client Testimonials

KEY CLIENT REFERENCES

WHOMSOEVER IT MAY CONCERN

This is to certify that AuM Systems(AUTOMATION AND MAINTENANCE MANAGEMENT SYSTEMS), Coimbatore., have provided flow monitoring / survey services, using portable clamp-on metering, to help Coimbatore Corporation with water flow data in the summer months.

AuM Systems(AUTOMATION AND MAINTENANCE MANAGEMENT SYSTEMS), services were found to be accurate and competent and helped us to manage the summer water distribution needs and even to detect some leaks from the water network, of different pipe sizes(250mm dia to 1100mm dia), in different pipe materials. The metering equipment from German Manufacturers Flexim and Nivus gave good performance.



With Regards

City Engineer
City Municipal Corporation
Coimbatore.

A.E

Siruthuli
Clean Kovai. Green Kovai.

Chairman
Dr. S V Balasubramaniam
Chairman,
Bannari Amman Group of Companies

Managing Trustee
Smt Vanitha Mohan
Chairman,
Pricol

Trustees
Sri Ravi Sam
Director,
LMW Group of Companies

Sri Kanakalal Abhaichand
Partner
TV & Brothers

Sri N V Nagasubramaniam
Senior Advocate

Dr R V Ramani
Managing Trustee
Sankara Eye Society

Sri C R Swaminathan
President
RAAC

21st Sept 2019

To

Mr. Prakash Muthuswamy
Managing Partner
Automation and Maintenance Management Systems (AuM)
No. 6, Third Floor, Sri Ram Apartments,
Avinashi Road, Papanaikan Palayam,
Coimbatore - 37

Dear Sir,

Greetings from Siruthuli!

We would like to express our sincere gratitude towards your support in calibrating the flow of sewage in the Irugur channel. Your technical support has enabled us to have a better understanding to develop a suitable methodology for treatment of wastewater.

It is the magnanimity of people like you that has enabled Siruthuli to make a difference to the environment in Coimbatore region.

While thanking you once again we look forward to your continued support and guidance in carrying our eco message to as many people as possible in the times ahead.

Let's together make Mother Earth smile!

Green Regards,

Vanitha Mohan

Managing Trustee

INDIAN INSTITUTE OF TECHNOLOGY, MADRAS, CHENNAI - 600036, INDIA

Dr. Soumendra Nath Kuiry
B. Tech. (Civil Eng.), M. Tech. (Hydraulics and Water Resources Engineering), Ph. D.
Assistant Professor, Department of Civil Engineering

Phone : 044-2257-4309 (O)
: 09444088950 (M)
Fax : +91-44-2257-4252
E-mail : snkuiry@iitm.ac.in

Date: 19.03.2020

Performance Certificate

To whomsoever it may concern

I had purchased a Portable Open Channel Flow Meter against Po. No: CIE /SOUE/2018/1048/SPLX957. I hereby confirm that the Portable Open Channel Flow Meter PCM4 with POA Wedge Sensor manufactured by Nivus, Germany and supplied by Automation & Maintenance Management Systems is performing satisfactorily

Dr. SOUMENDRA NATH KUIRY
Assistant Professor
Department of Civil Engineering
Indian Institute of Technology Madras
Chennai - 600 036, India

KEY CLIENT REFERENCES

KITCO Ltd.
(Estd. In 1972 by IDBI & Govt. of Kerala)

45 YEARS

Regd. Office: Femith's, P.B. No: 4407
Puthiya Road, NH Bypass
Vennala, Kochi 682 028, Kerala, India
Tel : +91-484-4129000 / 6129000
Fax : +91-484-2805066
E-mail: mail@kitco.in, Web: www.kitco.in

CIN : U74140KL1972GOI002425

TO WHOMSOEVER IT MAY CONCERN

KITCO was awarded for the work of "*Technical Performance and Service Delivery Assessment of Ten (10) Multi Gram Panchayats Water Supply Schemes in the State of Kerala*", by KRWSA, Thiruvananthapuram. As part of the project, M/s Automation and Maintenance Management (AuM) Systems, Near Lakshmi Mills Junction, Sree Ram Apartments, Avinashi Road, P.N.Palayam, Coimbatore-37 was engaged for the work of flow measurement using ultrasonic flow meters for selected points of 10 water supply schemes by KITCO.

The scope of the work of M/s Automation and Maintenance Management (AuM) Systems was continuous flow measurement of upto 15 locations at each scheme, for a period of 3 days with 18 packages.

The Services of M/s Automation and Maintenance Management (AuM) Systems were found to be very good

Jose Davis
Joint General Manager

Place : Kochi
Date : 24/07/2018

KITCO the consultants

Thiruvananthapuram
TC.4/1687, 42, Belhaven Gardens
Kowdiar P.O., Thiruvananthapuram 695 003
Tel/Fax: +91-4712728543

Chennai
First Main Road, MEPZ-SEZ, GST Road
Tambaram, Chennai 600 045
Tel: +91-4445118383

New Delhi
FB-048, NSIC STBP Extn, NSIC Bhawan, Gate No : 02,
Okhla Industrial Estate, New Delhi 110 020
Tel: +91-1141030081

TATA

TO WHOMSOEVER IT MAY CONCERN

This is to certify that M/s. Automation & Maintenance Management (AuM) Systems, Coimbatore has been engaged by us **Carrying Out Level, Velocity and Discharge Measurements for Boduru Gedda River in Andhra Pradesh for a period of One (1) Year.** Nivuflow 750 flow meter with CS2 Wedge sensor from Nivus GmbH, Germany was used with solar backed power supply for the operation.

AuM Systems provided comprehensive services to us during the period of assignment from 10th March 2021 to 10th March 2022 and their performance is time-bound and satisfactory. They have demonstrated the required knowledge for carrying out hydrological observations and used high accuracy device to obtain the requisite data.

Saradhi

K Vijaya Saradhi
Asst. General Manager - Civil
(Tata Consulting Engineers Limited)

Place: Bangalore
Date: 14-09- 2022

Prof. Lakshminarayana Rao
Associate professor
Centre for Sustainable Technologies
Indian Institute of Science
Bangalore 560 012, India.

Phone : (+91-80) 2293 2051
Fax : (+91-80) 2360 1692
Email : narayana@iisc.ac.in

09th June, 2022

Project Performance Feedback Certificate

Flow Measurement Services at Various Open Channels and Pipes Concurrently for a Period of Fifteen (15) Days

As part of a requirement to verify flows for the City Water and Wastewater Department, the consultant for the project, *Indian Institute of Science, Bangalore* engaged *Automation & Maintenance Management (AuM) Systems, Coimbatore (PO ref: SID/20-21/D-0172 dtd 17.03.2021)* to monitor, acquire and report data viz. level, velocity and discharge, for various points (open channels and pipes). All points were measured concurrently and daily cumulative totals were also provided. Certified and calibrated ultrasonic based flow meters were used for the measurements.

The monitoring commenced on 28th March, 2021 and concluded on 13th June, 2021. Our sub-contractor, AuM Systems, demonstrated the required knowledge for meter selection, selection of metering locations and used high accuracy devices to obtain the data. The data from the study was to our satisfaction and was helpful to identify key issues and paved the way for remedial actions.

For Indian Institute of Science, Bangalore,

With warm regards

(Lakshminarayana Rao)

Place:
Date:

KEY CLIENT REFERENCES

LARSEN & TOUBRO

Larsen & Toubro Limited, L&T Construction
Water Effluent Treatment IC,
Shorgumbaz WTP campus,
Opp. Sahara Function hall, Kalaburagi

Project Performance Certificate

03rd March, 2023

Flow Measurement Services at Various Water Supply Schemes

As part of a requirement to verify flows in the water network for the City of Kalaburagi, Larsen & Toubro Limited, Construction engaged *Automation & Maintenance Management (AuM) Systems, Coimbatore (WO ref: EK896WOD1000005)* to monitor, acquire and report data viz. velocity and discharge, on the pipe lines of various water supply schemes. All points were measured concurrently and daily cumulative totals were also provided. Certified and calibrated ultrasonic based flow meters were used for the measurements.

The monitoring commenced on 28th January, 2021 and concluded on 12th February, 2021. Our sub-contractor, AuM Systems, demonstrated the required knowledge for selection of metering locations and used high accuracy devices to obtain the data. The data from the study was to our satisfaction and was helpful to identify key issues and paved the way for remedial actions.

For Larsen & Toubro Limited, Construction.

Place: KALABARAGI

Date: 3rd Mar. 2023

BRIHANMUMBAI MUNICIPAL CORPORATION

(HYDRAULIC ENGINEER'S DEPARTMENT)

WATER TREATMENT PLANT, BHANDUP COMPLEX

1 JAN 2023

WORK COMPLETION CERTIFICATE

Sr. No.	Description	Remarks
1	Name of Work	Flow measurement at various locations using clamp-on flow meters
2	SCR No. & Date / Sanction No.	H.E.'s sanction U/No. HE / 1296 / I dated 14.09.2021
3	Contract Cost / Revised cost	[redacted]
4	Contract period / Revised period	1 Year
5	Name of Contractors (JV/consortium if any details)	M/s. Automation & Maintenance Management Systems
6	Name of the Sub contractors	Not Applicable
7	Sanction of the competent authority with the percentage of sublet work (shall not be more than 49% of the contract cost)	Not Applicable
8	Scheduled date of start of work	08.10.2021
9	Actual date of start of work	08.10.2021
10	Scheduled date of completion of work	07.10.2022
11	Actual date of completion of work	07.10.2022
12	Cost of work completed by main contractor	[redacted]
13	Cost of work completed by sub-contractor	Not Applicable
14	Scope of work with main items with costs	Nil
a.	Mechanical	Nil
b.	Electrical	Nil
c.	Electronics work	[redacted]
d.	H.E.	Nil
e.	Services/works/Supply	Services
15	Penalty imposed if any	Nil
16	Whether the work completed satisfactorily	Yes.

This certificate is issued on specific request by **M/s. Automation & Maintenance Management Systems**

11.01.2023
(G.M. Nadkarni)
Executive Engineer (S.I.P.S.)

Indian Institute of Science
Department of Management Studies
Bangalore 560 012

भारतीय विज्ञान संस्थान

Parthasarathy Ramachandran
Professor

parthar@iisc.ac.in
Phone: (080) 2293 3336

March 31, 2023

To whomsoever it may concern

Automation & Maintenance Management (AuM) Systems, Coimbatore supplied, installed and commissioned Solar powered, IOT enabled Flowmeters and Pressure Transmitters with SCADA for the project titled "*DP-Trans Digital twin for Pipeline TRANSport network*" funded by Ministry of Electronics and Information Technology. Solar panels were used to power the devices.

AuM Systems demonstrated the required knowledge for meter selection, selection of metering locations and good installation practices. The project was executed and completed to our satisfaction.

Yours Sincerely

(Parthasarathy Ramachandran)

KEY CLIENT REFERENCES

IOCL, BARAUNI REFINERY

Completion Certificate

1. Name of the department: Safety/Health & Envir
2. Name of Work: Flow measurement of water streams / condensate / BFW for water study atIOCL barauni Refinery.
3. Work Order Number: 25773576
4. Name of Contractor: 13218589 - AUTOMATION & MAINTENANCE MANAGEMENT
5. Original Contract Value:
6. Date of Commencement: 04.01.2019
7. Date of Actual Completion:
8. Date of Completion (CDD): 03.02.2019
9. Extension granted,if any:
10. Executed Value of the Contract:

(without GST)

25/2/2019

11. Certified that the work has been completed as per drawings and specifications.

Engineer / Site Engineer — Sr.Engineer — Dy.Manager — Engineer Incharge

19/2/2019 — 25/2/19 — 27/2/2019

IOCL, GUWAHATI REFINERY

Final Completion Certificate

1. Name of the department: Instrumentation
2. Name of Work: Water Flow Survey at Guwahati Refinery.
3. Work Order Number: 25946171
4. Name of Contractor: 13218589 - AUTOMATION & MAINTENANCE MANAGEMENT
5. Original Contract Value:
6. Date of Commencement: 16.05.2019
7. Date of Actual Completion: 23.05.2019
8. Date of Completion (CDD): 31.05.2020
9. Extension granted,if any:
10. Executed Value of the Contract:

11. Certified that the work has been completed as per drawings and specifications.

12. Certified that the contractor has cleared the site.

13. Certified that nothing is due from contractor for supplies made, liquidated damages etc.

14. Certified that no defects have been found/ defects noted during the defect liabilty have been rectified. (strike which is not applicable)

15. Security Deposit of Rs._ _____ may please be refunded.

16. The contractor has deducted and deposited the PF amount in Scheduled Bank in respect of the workers employed with him as per the provisions of PF act.

18-10-19

Engineer / Site Engineer — Sr.Engineer — Dy.Manager — Engineer Incharge

राजीव मिंज / Rajeev Minz
सहायक प्रबंधक
Assistant Manager
आई ओ सी एल गुवाहाटी रिफाइनरी नूनमाटी गुवाहाटी-20
IOCL,Guwahati Refinery,Noonmati,Guwahati-20

PAGE 1 OF 1

WATER & ENVIRONMENT

MEASURE BETTER TO MANAGE BETTER

Committed to the cause of protecting our environment…..

ALM SYSTEMS
People. Technology. Sustainability.