3rd CGD O&M Conference, New Delhi

Odourisation in MGL

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MAHANAGAR GAS

About MGL

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- MGL receives Gas from M/s GAIL (INDIA)
- MGL has 4 Gas Receiving Stations
- Automated Odourant Injection Systems are installed at four gas receiving stations

Sr. No.	Gas Receiving Stations	Gas Drawl (MMSCMD)	Odourant Consumption (Kg/day)
1	Sion	1.9	12
2	Mahape	0.8	5.5
3	Ambernath	0.25	1.4
4	Taloja	0.05	0.37
TOTAL		**3.00**	**19.3**

- Changeover of Odourant from "**Ethyl Mercaptan**" to "**Spotleak**"
- Odourant Supplier – 1. M/s Varicon Pump & System Pvt Ltd
  2. M/s Imkemex International Ltd
- Odourant performance is checked using odourant detectors at the extreme ends of MGL network on daily basis

Odourisation in MGL

Automated Odourisation System

- System mainly consists of Storage tank, Controller, Pneumatic operated pumps, Scrubber
- Odourant Storage Tank Capacity – 1500 Litres
- **Master–Slave Dual Standby System**
- System can operate in two Mode;
  - ✓ Flow Mode
  - ✓ Time Mode
- In Flow mode , Odourant quantity is injected in the system in proportion to the gas flowrate of the CGS
- In Time Mode, Fixed Odourant quantity is injected in the system at fixed time interval
- In built Level Transmitter to monitor the level of the odourant available in storage tank
- Odourisation system is integrated to SCADA

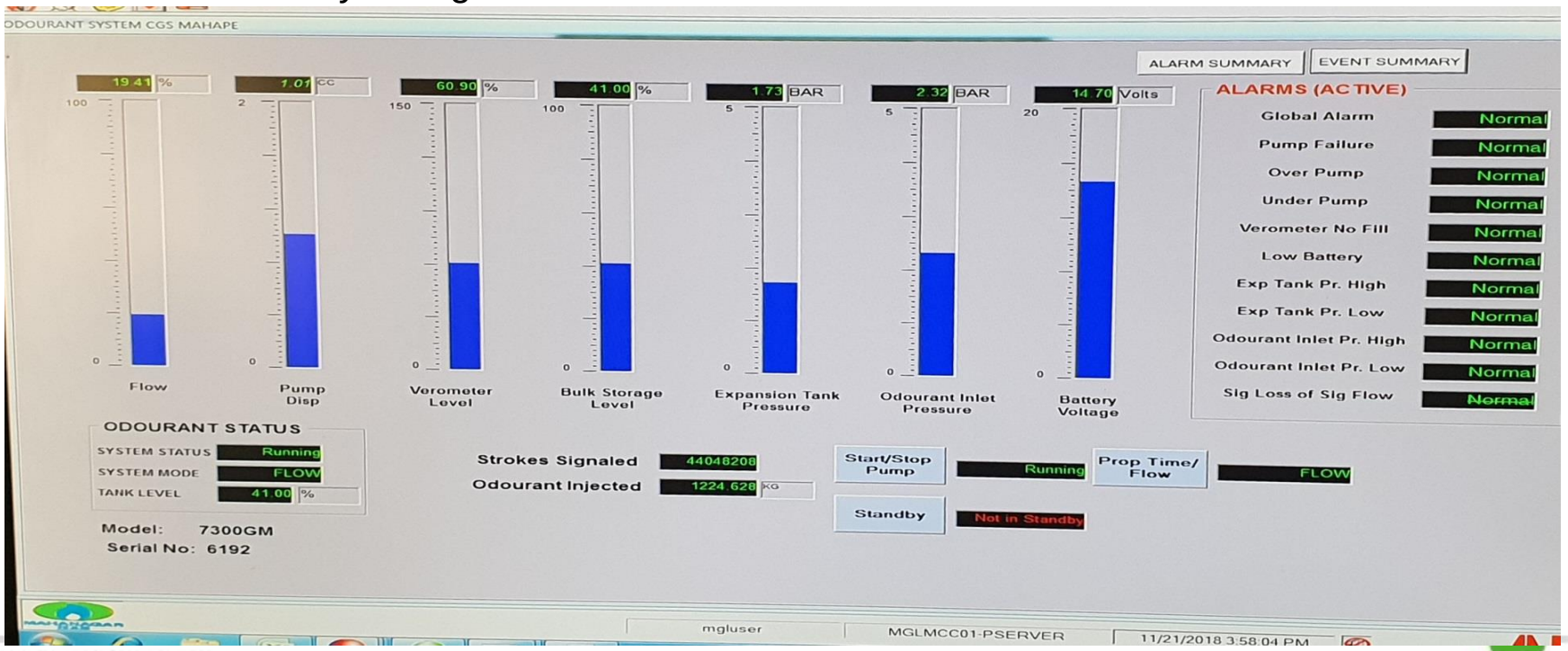
Effective Monitoring through SCADA Control Room

Important Parameters of the System

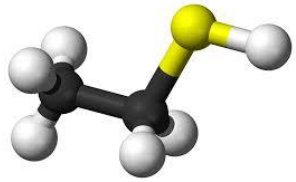
- Odorant Tank Level
- Odorant Injected Qty
- Vero meter level
- Odorant Inlet pressure
- Gas Flowrate (%)
- Expansion Tank Pressure
- No. of Strokes
- System mode : (Flow/Time)
- Battery voltage

Alarms configured in the System

- ✓ Low Tank Level
- ✓ Low Battery Voltage
- ✓ Tank Pressure High/Low
- ✓ No Gas Flow
- ✓ Pump Failure



Ethyl Mercaptan



Why Ethyl Mercaptan ?

- Ethyl Mercaptan is used as an odourant for LPG
- Ethyl Mercaptan is a conventional odourant being extensively used for Natural Gas
- People are familiar with the smell, hence the same odourant is being used for Natural Gas

Limitation

- Odour fading across the flag end of the network
- Odour fade seen more predominantly in installations of new network than the existing network.
- Less resistance to oxidation resulting into long term impact on Steel pipeline

Considering these facts, need was felt to explore the alternate odourant for Natural Gas to overcome the drawbacks of existing odourant.

Introduction of Alternate Odourant

MGL performed HAZOP study for alternate odourants and decided to use "**Spotleak**" which is blend of mercaptans and sulphides

About "Spotleak" (TBM + MES)

- Combination of 80% of TBM and 20% of MES
- Smell of the odourant resembles with Ethyl Mercaptan
- Less reactive than Ethyl Mercaptan, hence fading effect is minimal
- Less toxic than Ethyl Mercaptan
- Through AGA survey, response on usage of TBM and MES blend odourant was studied and found that this blended odourant is being successfully and effectively used by different CGDs in US and Europe.

Trial Project at CGS Ambernath

Steps followed for execution of Trial Project

- MGL approached PNGRB for Introduction of new odourant in a specific area
- Independent CGS, Ambernath is selected for trial project. It has 20 Kms of PE and 40 Kms of Steel Network
- Network of CGS Ambernath was studied and the measurement points were defined to check the odourant performance throughout the network
- Installed Independent Storage Tank for Alternate odourant
- Before introducing the new odourant in the network, Ethyl Mercaptan performance test was conducted at defined locations for comparison
- Once new odourant was injected in the pipeline network at CGS, performance test was conducted at the same locations for two months
- Results of odourant performance were analysed and report was submitted to PNGRB for review
- Subsequent to PNGRB approval, Spotleak was introduced to the entire pipeline network

Performance Test at Defined Locations

Ethyl Mercaptan Vs Spotleak

Observations with “Ethyl Mercaptan” Vs “Spotleak”

Defined Locations	Ethyl Mercaptan (Injection Rate 12.5 PPM) 	Spotleak (Injection Rate 7 PPM) 
At network near to the injection point	Adequate	Very strong
At the extreme end of network	Inadequate	Adequate
At the network where gas flow is stagnant or very negligible (less downstream load)	No odourant smell	Adequate
Newly Commissioned network	No odourant smell	Adequate

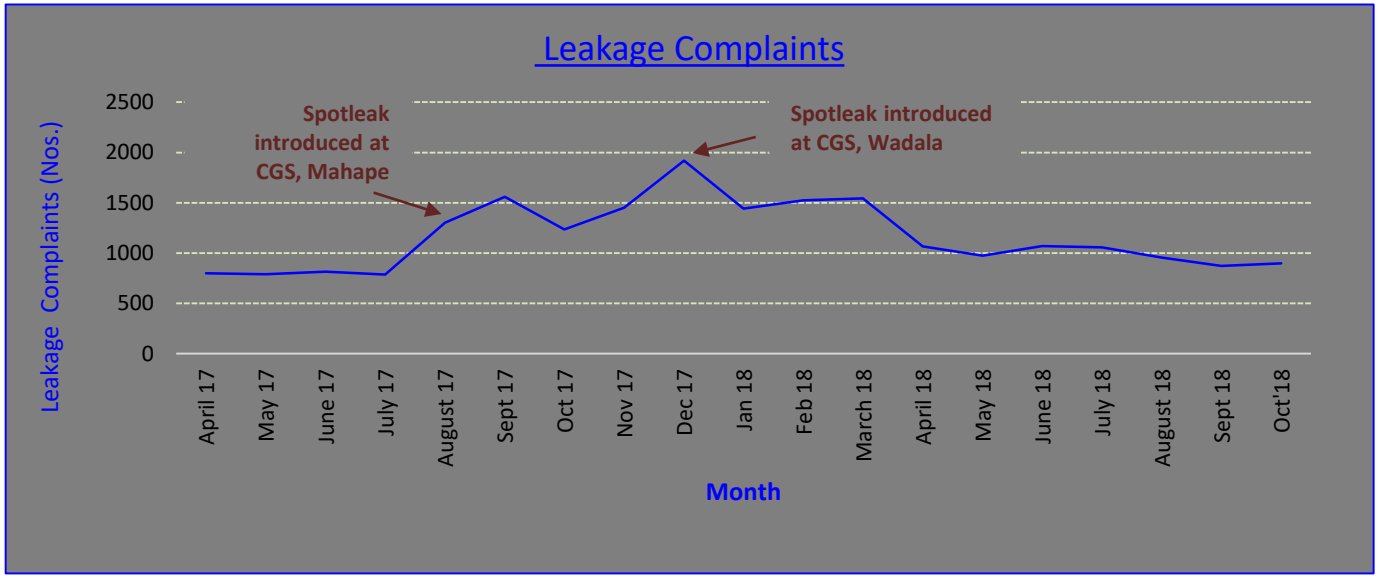
Results

Sr. No.	Measurement Points	Distance from Ambernath CGS (Kms)	"EM" Performance Test (Injection Rate 12.5 PPM)		"Spotleak" Performance Test (Injection Rate 7 PPM)	
			by Detector (PPM)	by Human Nose	by Detector (PPM)	by Human Nose
1	Service Regulator at Ambernath CGS	0.07	11.5	Strong	6.9	Very Strong
2	Service Regulator at Veena Appartment, Shivganga Nagar, Ambernath	5.20	6	Adequate	6.9	Very Strong
3	Service Regulator at May Flower Shivganga Nagar, Ambernath	5.48	6	Adequate	6.9	Very Strong
4	Mr. Prakash Yeole Flat no. 101, Carnation, May Flower, Shivganga Nagar		2	Weak	6.4	Strong
5	Mr. Virendra Singh Dahlia, Flat no.104, May Flower, Shivganga Nagar		2	Weak	6.4	Strong
6	Mr. Ramesh Kukreja Dahlia, Flat no.102, May Flower, Shivganga Nagar		2	Weak	6.3	Strong
7	Riser at Awas Kunj, Shivganga Nagar, Ambernath	7.30	4	Adequate	6.3	Strong
8	Mr. N. Mahadeshwar Flat no.G4, Awas Kunj, Shivganga Nagar, Ambernath		2	Weak	6.1	Strong
9	Mr. M G Sapavya Awas Kunj, Shivganga Nagar, Ambernath		2.5	Weak	6.1	Strong
10	Service Regulator at Hari Naam Soc, Waldhuni, Vitthalwadi (W)	12.50	0	No Smell	5.2	Adequate
11	Service Regulator at Yash Appartment, Waldhuni, Vitthalwadi (W)	13.00	0	No Smell	5.0	Adequate
12	Service Regulator at Virat Darshan, Waldhuni, Vitthalwadi (W)	13.60	0	No Smell	4.8	Adequate
13	Service Regulator at Laxmi Tower Waldhuni, Vitthalwadi (W)	14.20	0	No Smell	4.2	Adequate

Complete Changeover to “Spotleak”

Benefits of Spotleak after injection in entire MGL netwok

- All minor gas leakages were detected and rectified



- Enhanced the safety of the pipeline network and the end user through its characteristic smell
- Unaccounted gas losses were minimized
- Less breakdown of injection system
- Less toxic than Ethyl Mercapatn

Thank You...

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