

### Integrity Municipal Systems Restores 18-Year Old Emergency Chlorine Vapor Scrubber Systems for County of Maui, HI

The County of Maui Department of Water supplies approximately 75% of Maui's clean drinking water. Emergency chlorine vapor scrubber systems are an integral part of the chlorination/disinfection systems for the water treatment plants. These systems are designed to contain and neutralize chlorine vapor in the event of a potentially hazardous chlorine gas leak. A scrubber mounted exhaust fan pulls chlorine-laden air from the chlorination building through a three-stage scrubbing system that includes recirculation of caustic over a packed media bed to neutralize the chlorine gas vapor. The proper functioning of these systems is critical to

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Bruce Rollins, Plant operator

the safe and compliant operation of the water treatment facilities. That's where the skilled technicians of Integrity Municipal Systems (IMS) come in.

In May 2012, the Department of Water contacted IMS seeking service and restoration of the emergency vapor phase chlorine scrubbers installed at the Lahaina, Mahinahina, and Piipolo Water Treatment Facilities. Due to its historical connection with RJ Environmental Inc. (RJE) – which, like IMS, was founded and operated by Roop Jain, P.E. – IMS was the natural choice to rehabilitate these essential systems. RJE designed, manufactured, and commissioned each of these systems while under the management of Mr. Jain from 1994 through 1996.

Working together with Tony Linder, W.T.P. Division Chief, Mr. Jain determined that the spent caustic could be used at the local wastewater treatment plant and the acid wash solution generated during the cleaning process could be neutralized on-site and disposed through the local wastewater treatment system. This creative solution avoided the expense of removing spent material from the island. In all, the IMS service approach saved the County of Maui over \$100,000 when compared against the next lowest bidder.

"We are very happy with the professionalism and limited down

time executed by Integrity Municipal Systems on this project," said Linder. "From the initial site visit by Mr. Jain himself, and all the way through completion of this project, IMS has proven itself in the eyes of County of Maui, D.W.S."

IMS personnel began cleaning and restoring the systems in November 2012. The cleaning process included loading existing caustic into totes, dissolving caustic solids in the scrubber sump and internal packing media with Muriatic acid solution, neutralization of acidic brine solution, cleaning spray nozzles and liquid distributor, cleaning packing media, removal of neutralized solution using totes, and rinsing all internals with water. Once cleaned, the systems were closely inspected prior to recharging with 2,100 gallons of fresh caustic per system. Restoration included painting the exterior of the inlet ducts, scrubbers, and exhaust stacks, and replacement of the sight glass, drain/overflow assemblies, and pressure gauge piping assemblies. In addition, one scrubber recirculation pump was heavily corroded and one packing support grating was broken; so a new pump was installed and broken FRP grating replaced along with three new pressure gauges and guard assemblies.

Bruce Rollins, Department of Water Plant Operator and the manager of the refurbishment project, stated:

"Three of our chlorine scrubbers were in need of maintenance, with extensive build-up on the media, spray nozzles, and the floors of the scrubbers. Two IMS technicians cleaned the interiors and rebuilt the insides, as needed. They had to replace a pump on one of the scrubbers and redid the outside piping on all three. When they were done, all three scrubbers were back to near-new condition. IMS exceeded our expectations in every respect. They finished their work ahead of schedule despite some unexpected issues. I strongly recommend IMS and their skilled technicians for chlorine scrubber refurbishment."

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Tony Linder, W.T.P. Division Chief

**BEFORE**



**AFTER**

