

CASE STUDY: AVOIDING UNPLANNED OUTAGES IN WATER TREATMENT

Featuring the Pulsafeeder Eclipse Series



City of Escondido, California

Maintenance professionals within Water and Wastewater Treatment facilities are as busy as ever. To keep up with growing demands on their time, they are always looking for ways to improve the reliability and maintenance requirements within their scope of responsibility. Pulsafeeder's rotary pumps can play a critical role in these systems and help to reduce both unplanned and scheduled maintenance work.

The **City of Escondido Water Treatment** plant has the ability to treat up to 75 million gallons per day for approximately 25,000 residential, commercial and agricultural customers in California. Their On-Site Hypochlorite Generation (OSHG) creates disinfecting sodium hypochlorite (NaOCl) from salt, water and electricity to treat water from multiple natural water sources. The delivery of the NaOCl to the point of injection had been accomplished with peristaltic pump technology.



Figure 1 – Constructed in 1976, the City of Escondido Water Treatment Plant in California supplies water to 25,000 residents

THE CHALLENGE – MINIMIZING UNPLANNED PUMP FAILURES

The pumps being used required frequent tube replacements which led to extra maintenance work. They also required a means to control pulsation and vibration within the flow of the system. Tube failures resulted in high costs due to pump down time, spare parts and man hours to make the repairs.

The Senior Plant Systems Technician had previously worked at the City of Escondido wastewater treatment plant and had similar problems there when they used peristaltic pumps. Not only were these pumps more expensive, he knew the real cost came with the increased maintenance they required and that, in the long run, it was not the best solution.

THE SOLUTION – LESS MAINTENANCE WITH GEAR PUMPS

The city of Escondido rotates their personnel in order to learn and share experience across the different sites and functions. As a result, the senior technician quickly noticed the frustration faced by the maintenance personnel at the water treatment facility and could compare it to the experience he had in the wastewater treatment plant where he had found success with switching to rotary gear pumps as an alternative to peristaltic. His experience and his established relationship with local Pulsafeeder representative, CP Crowley, naturally led to the suggestion, "Why don't we use Eclipse here?"



Figure 2 – The City of Escondido Water Treatment Plant replaced peristaltic pumps with Pulsafeeder Eclipse E25 and E125 Hypo Gear Pumps

Working with Crowley and Pulsafeeder, they opted to do a trial with the Eclipse series to show, in a field setting, what the advantages were. This trial led to a complete changeover from the peristaltic pumps to the Pulsafeeder Eclipse Pumps in the water treatment plant.

The Advantages

- **Maintenance Frequency** – In this type of installation, Eclipse pumps can run 24/7 and, in many cases, go years before service is required. Moving to Eclipse saved thousands of dollars every year in labor and parts.
- **Ease of Maintenance** – Featuring a “repair-in-place”, front pull-out design, when maintenance is required on the Eclipse, it is simple and streamlined. This reduces the cost and frustration of replacing wearable parts and ensures that the pump is quickly put back in service.



Figure 3 – The front pullout design of the Eclipse allows for the unit to be quickly repaired where it is installed without removing any attached piping

- **Size** - The Eclipse E25 and E125 pumps were able to meter the diluted hypochlorite at rates up to 33 GPM, with less horsepower and a smaller footprint than the peristaltic pumps.
- **System Complexity** - The use of Eclipse, a positive displacement laminar flow pump, meant that oversize piping and pulsation dampeners could be eliminated. These features and accessories were originally needed because pulsating flow requires larger pipe diameters and dampeners to minimize pressure fluctuations, reduce the pipe size and improve the NPSH. The dampeners also required man hours to monitor and maintain their charging pressures and make repairs when bladders wore out. None of these accessories or features are needed with Eclipse. Laminar, pulseless flow means piping size can be optimized, there will be less noise from water hammer and, less system stress. With Eclipse installed, smaller piping and less accessories saved plant even more in maintenance and infrastructure costs.



Figure 4 –Eclipse series E25 and E125 Hypo Pumps metering Sodium Hypochlorite (NaOCl) provide pulseless, laminar flow with smaller piping and without the need for dampeners

- **Reliability and Safety** - Lastly, tube failures on large pumps can be relatively unpredictable and dangerous. When a tube fails, it is often without warning and this means immediate action from maintenance and service personnel. The burst tube exposes pump internal components to the process chemical and these are typically not compatible materials of construction, possibly leading to more than just a tube needing replacement. Add to this the fact that the tubes in these large 35 GPM pumps can be heavy and covered with lubricant means personnel literally, "have a mess on their hands," likely finding themselves in contact with hazardous chemicals and working in difficult situations.

The Eclipse pump can avoid all of that. With a properly sized gear pump, a characteristic curve can be established at commissioning which will give a baseline relationship between pump speed and flow produced.

With periodic monitoring of pump performance, when the pump begins to operate faster to achieve a given flow, it is possible to predict when a pump will need some minor maintenance and spare parts can be pre-ordered. When the necessary speed limit is reached, personnel can schedule pump maintenance and return it to like new performance in a matter of minutes without removing the pump from the system.



Figure 5 – The Pulsafeeder Eclipse Series of Gear pumps have a wide array of options including metallic and non-metallic

CONTACT A DISTRIBUTOR NEAR YOU

Many installations are ideal for both Eclipse metallic and non-metallic gear pumps. They offer ease of maintenance with a service-in-place design, laminar flow to eliminate the problems associated with pulsations, and the pumps inherent ability to observe its health and predict future maintenance. This makes the non-metallic Eclipse pump an ideal choice for moving sodium hypochlorite in On-Site Hypochlorite Generation plants like at the City of Escondido.

Contact your nearest Pulsafeeder representative and see how an Eclipse pump is the best choice for your application.