



Serving the Pacific Northwest

PumpTech Pipeline

Providing Knowledgeable Solutions

PumpTech, Inc.

Bellevue, WA
12020 SE 32nd St #2
Bellevue, WA 98005
888-644-6686

Canby, OR
321 S Sequoia Parkway
Canby, OR 97013
503-659-6230

Moses Lake, WA
209 S Hamilton Rd
Moses Lake WA 98837
509-766-6330

Inside this issue:

Rock Creek VTPs	2
Sierra Pacific continues	3
Chewelah Chopper Pumps	4
Cheyne Booster continues	4
PumpEd 101 - Energy Audit	5
Constant Chlor	6
Canby Manufacturing	6
PumpTech PumpChat	7
Information & Credits	8
Upcoming Events	8
Line Card	8

FluxDrive Reduces Power Costs by \$30,000.00/yr At SPI Mill

Steve Manwell, PumpTech Bellevue

Sierra Pacific Industries is a third generation, family owned forest products company based in Anderson, California. It owns and manages nearly 1.9 million acres of timberland in California and Washington and is the second largest lumber producer in the US. In addition to its timberland, it owns and operates ten sawmills in CA, six of which provide cogeneration. Up here in WA, it has sawmills in Aberdeen, Burlington and Centralia. The Burlington and Aberdeen facilities cogenerate power for the grid while Centralia generates power for its own use.

In 2013, the Centralia mill installed a FluxDrive adjustable speed drive on their boiler's 200 HP, induced draft



fan. The FluxDrive solved two major issues and reduced electrical costs substantially. The photo above shows Cogen Superintendent, John Gardner standing next to the installation.

Centralia had two major problems with the existing system. The first was belt

[Sierra continues on Page 3](#)

Cheyne Landfill - Hydronix Packaged Irrigation System

Ed Smith, PumpTech Moses Lake
Jim Joyce, PumpTech Bellevue

The Cheyne Landfill, located north of Zillah, WA, was designed for both liquid and dried biosolids and



incorporates lined septic lagoons. The on-site, irrigation well was contaminated due to the waste products in the landfill. Originally, water from this well was used to irrigate the active areas of the landfill and city water was used in other areas. Now, the contaminated well supplies a Hydronix 700 Series packaged system that includes both booster pumps and a tablet chlorinator. This system sanitizes the non-potable water and provides pressurized flow for irrigation in the areas surrounding the landfill. The system eliminated the need for any city water for irrigation at the facility.



[Cheyne continues on Page 4](#)

Click below to subscribe to Pipeline via Email
newsletter@PumpTechnw.com

Rock Creek WWTP Axial Flow Pumps

Don Carlile, PumpTech Canby

Late last year PumpTech and George Cortes of Morrison Pump did a start up on four Morrison axial flow pumps at the Rock Creek WWTP in Hillsboro. These pumps were part of an upgrade to the plant and are used to pump finished effluent to the outfall. They complement two existing Morrison pumps that are used to pump mixed liquor. The picture below shows the pumps in operation.



The two pumps to the left of the picture are 20", 75 HP units designed for variable speed flows of 4500 GPM to 8500 GPM at heads of 9 ft to 26 ft. The tested hydraulic efficiency is 87%. The two on the right are 24", 200 HP units designed for variable speed flows of 7600 GPM to 15250 GPM at head of 10 ft to 38 ft. Their tested hydraulic efficiency is 90%. The high efficiencies was one of the reasons Corollo Engineers selected Morrison for this project.



The photos at the bottom left and above are other views of the installation. The one below shows one of the pumps during installation. Installation was done by PEK Construction.

PumpTech is currently working on two more Morrison projects that will install in Washington and Oregon. One includes two 48" flood control pumps for the city of Tacoma which will go out to bid this spring. The other involves four 24", 40 HP pumps for the Corps of Engineers. These very low head pumps (4.6 ft) will run at 395 RPM via a right angle gear drive and will produce a flow of 18700 GPM at 87.5% hydraulic efficiency. They will be installed at Foster Dam in Sweet Home and will be used to pump water from the tailrace to the fish ladder pool. CH2M Hill did the design and Natt McDougall Company will provide the installation. Installation is scheduled for late February.



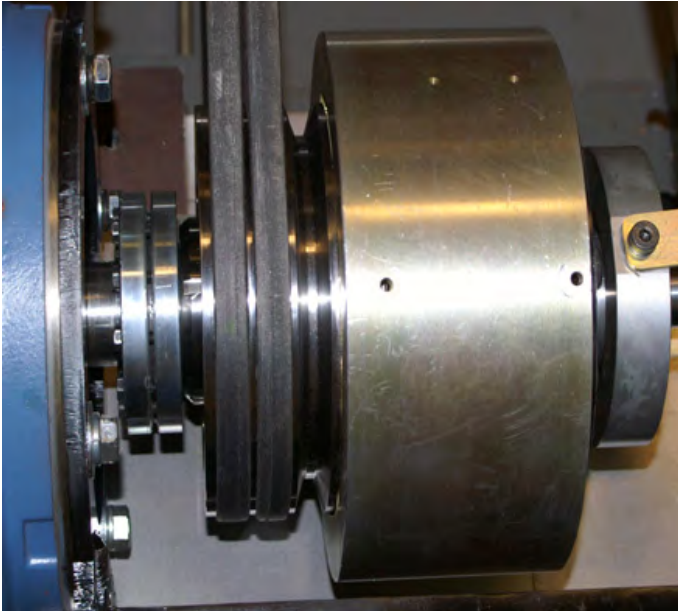
In late 2011 PumpTech did a start up on three Morrison pumps at the mouth of the Elwha river. These 300 HP, 70000 GPM pumps provided flood control for the Klallam Indian tribe. If you would like to read more, download the Winter 2012 newsletter from the "Resources" page at PumpTechnw.com.

Dcarlile@PumpTechnw.com

Sierra Pacific Continues

slippage during across the line starting. This was causing shortened belt and sheave life. In order to eliminate slippage they had to over tighten the drive belts and this caused the second problem. The higher belt tension increased the bearing load which gave rise to premature bearing failure.

So, how did FluxDrive solve these problems? The photo below shows a FluxDrive belt drive coupling. It



consists of an outer can that is lined with rare earth, permanent magnets and is directly connected to the sheave that drives the load. Inside the can is an induction rotor that is directly connected to the motor shaft. There is a small air gap between the can and rotor. When the motor starts, the magnets inside the stationary can induce a magnetic field in the rotor. The field that builds up in the rotor opposes the field that created it and the torque that arises from this interaction causes the can to turn in the same direction as the rotor. During starting, the air gap causes a significant amount of slip between the can and rotor. This provides a cushioned start that allows the motor to accelerate to full speed while the driven machine reaches full speed more slowly. This cushioned start eliminated belt slippage and the reduced belt tension preserved bearing life. Once the motor reaches full speed, the slip between the can and the rotor is reduced to about 1.5%.

So, how did the FluxDrive reduce energy consumption by 550,000 kWh per year? Balanced draft boiler designs can utilize two types of fans. A forced draft (FD) fan delivers combustion air to the furnace. An

induced draft (ID) fan reduces the atmospheric pressure in the boiler and forces flue gases into and out of the stack. The 200 HP, induced draft fan was designed to provide air flow when the boiler is under full load. There are, however, many times during the day when full load is not required and the boiler operates at a much lower load. During these periods, the fan would still operate at full speed and electrical power was wasted.

A unique feature of the FluxDrive coupling is that the overlap of the magnetic can and induction rotor can be varied. Reducing the overlap reduces the magnetic interaction between the two and therefore increases the slip. Increased slip reduces the speed of the fan and the power required for operation. This adjustable speed operation can be performed manually or in real time via a servo mechanism. The Centralia FluxDrive operates on a 4 - 20 ma signal that controls fan speed based on boiler load. The photo below shows the



drive servo installed on the FluxDrive coupling.

Test results show that the ID fan draws 98 kW at full speed and just 35 kW at 50% drive overlap. This resulted in a power savings of approximately \$30,000 per year. After the utility incentive, the pay back for the cost of the FluxDrive and installation was less than six months.

Sierra Pacific has been a valued customer of PumpTech for more than four years and we believe that there are several other applications that can benefit from FluxDrive couplings. Sierra Pacific also utilize our Grundfos C series multistage pumps in their boiler applications and Vaughan Choppers eliminate plugging in their storm water sumps.

Vaughan Choppers End Plugging at Chewelah Lift Station

Nathan Stark & Ed Smith, PumpTech Moses Lake

The town of Chewelah, Washington, located in the Colville river valley about 50 miles north of Spokane, installed a new lift station in 2006. Like many other small towns, they were having plugging problems due to the make up of their wastewater and the new “flushable” items that enter the wastewater stream. This tends to be a more frequent problem for smaller communities due to lower flow rates and the smaller pumps that are required. In most cases a 4” pump is the largest that can be accommodated.

By 2012, they were having to pull the pumps an average of six times per month which was a drain on their resources. In the fall of 2012, Robin Hegney got in touch with PumpTech to see if we could offer a solution. After evaluation of the system it was determined that a small non-clog could not handle the solids content. We suggested replacing the existing pumps with 5 HP,



Vaughan choppers which could be adapted to their existing rail system. The Vaughan choppers were installed in May of 2013 and have had no plugging issues. The pictures show the small wet well and one of the pumps during installation.

Chewelah was founded in 1873 by Thomas and Mary Brown and was incorporated in 1903. The name comes from the Indian word “Sche wee leh ee” which means water snake. Supposedly there was a spring on the SW side of town where the motion of the water gave the illusion of swimming snakes.

NStark@PumpTechnw.com ESmith@PumpTechnw.com

Cheyne Landfill Booster Continues



The Hydronix 700 Series booster system included a variable speed, Grundfos Boosterpaq; valves; gauges; transducers; hydro-pneumatic tank; the associated piping and a UL 508 NEMA 4 panel. Additional features included a 25 lb, dry tablet chlorination system and a 30 gallon solution tank. All of the components were installed in our Hydronix “Gull Wing”

fiberglass enclosure. The photos to the left and below show the enclosure with the



gull wings open and the interior of the system.

ESmith@PumpTechnw.com JJoyce@PumpTechnw.com



Pump Ed 101 – PumpTech’s Energy Audit Can Help Customers Reduce Operating Costs

Joe Evans, PumpTech Education & Training

In February, PumpTech introduced a new, no cost, service for our current and potential customers. We are offering to assist in energy audits of potentially problematic pumping applications. Its purpose is to evaluate actual pump performance and suggest potential changes that could reduce energy consumption. In addition to energy savings, maintenance costs will also be reduced when pumps operate at or near BEP. Motor testing is also performed in order to detect unacceptable phase unbalance which can substantially reduce motor life.

The figure on the right shows the cost of off BEP pump operation. This application was designed to run 8 hours per day and provide 900 GPM @ 130 feet of head. Unfortunately the system curve was miscalculated and the pump runs at 750 GPM @ 147 feet of head. In order to meet the daily flow requirement, it now runs 9.5 hours and hydraulic efficiency is reduced by 10%. The cost per thousand gallons pumped increases from 5.1 cents to 6.5 cents and the annual energy cost increased by \$2300.00. Off BEP operation can be caused by an inaccurate system curve or changes in down stream system conditions.

The figure below is a partial screen shot of our field test spreadsheet. It is designed to test end suction & split case pumps, submersible wastewater pumps and

Off BEP Energy Cost Calculator

REQUIRED DATA	BEP	Off BEP
Pump Operation - Hours / Day	8	9.6
Pump Operation - Days / Year	365	365
Pump Flow - GPM	900	750
Pump Head - Feet	130	147
Pump Efficiency - %	85%	75%
Motor Efficiency - %	94.1%	94.1%
Energy Cost in \$/kWh	\$0.10	\$0.10
RESULTS		
BHP At Operating Point	34.8	37.1
Wire to Water Efficiency (%)	80%	71%
Annual Pumpage (gal)	157,680,000	157,680,000
Annual Energy Consumption (kWh)	80,464	103,118
Annual Energy Cost	\$8,046.44	\$10,311.82
kW Per 1000 Gallons Pumped	0.510	0.654
Cost Per 1000 Gallons Pumped	\$0.051	\$0.065

lineshaft turbines. It provides all of the calculations required for comprehensive testing of both pumps and motors. Some of the calculations include BHP, pump efficiency, voltage & current unbalance and the cost per thousand gallons pumped. It will also plot a performance curve when multiple points are tested. If you would like PumpTech to assist you in an energy audit or pump test, contact your regional salesperson.

Centrifugal Pump Field Test Procedure (Suction & Discharge Gauge Measurement)

3	Manufacturer / Model # / etc	Cornell 3YH 4 X 3 - 1750 RPM - 10" Trim					
4	Job Name	Yellow Water Supply					
5	Date	8/13/2013	Witness	Maxine Waters			
6	Motor Serial Number	6666	Specific Gravity	1.00	Liquid Temp	60°F	
7	Pump Serial Number	666666	Q Measurement Method	Flowmeter			
8	Time of Day	12:00 PM					
9	Ambient Temp	70°F	°F	°F	°F	°F	
10	Motor Temp	265°F	°F	°F	°F	°F	
11	Vibration (in/sec peak to peak)						
13	Pump	Single or Multi Point Test	**See Instructions				
15	Flow Rate (GPM)	0	100	200	300	400	500
16	Suction Gauge Head ± (ft)	2.0	2.0	2.0	2.0	2.0	2.0
17	Gauge to Suction Friction (ft)	0.0	0.0	0.0	0.0	0.0	0.0
18	Suction Piping ID (in)	5.0	5.0	5.0	5.0	5.0	5.0
19	Discharge Gauge Head (ft)	100.0	99.0	97.0	91.0	79.0	60.0
20	Gauge to Gauge Elevation (ft)	2.0	2.0	2.0	2.0	2.0	2.0
21	Discharge to Gauge Friction (ft)	0.0	0.0	0.0	0.0	0.0	0.0
22	Discharge Piping ID (in)	4.0	4.0	4.0	4.0	4.0	4.0
23	Suction Velocity (fps)	0.0	1.6	3.3	4.9	6.5	8.2
24	Suction Hv (ft)	0.0	0.0	0.2	0.4	0.7	1.0
25	Discharge Velocity (fps)	0.0	2.6	5.1	7.7	10.2	12.8
26	Discharge Hv (ft)	0.0	0.1	0.4	0.9	1.6	2.5

Entered Data Calculated Results
 Printing - Set to landscape @ 75% of full size

Calculations:
 TDH = (Hd + GG + Fs + Fd + Hvd - Hs - Hvs)
 Hd = discharge gauge pressure in feet
 GG = vertical distance between gauges in feet
 Fs = friction - pump suction to suction gauge
 Fd = friction - pump discharge to discharge gauge
 Hvd = velocity head at the discharge gauge
 Hs = suction gauge pressure in feet
 Hvs = velocity head at the suction gauge

Velocity (V) = (Q * 0.4085) / ID²
 Q = flow rate (gpm)
 ID = pipe inner diameter
 0.4085 = conversion constant

Velocity Head (Hv) = V² / 2g
 V = flow velocity
 g = gravitational constant (32 ft/sec²)

BHP @ Test Point = (1.732 * Va * Aa * E * PF) / 746
BHP @ Test Point = (kW * E) / 0.746

More On Constant-Chlor Calcium Hypochlorite Disinfection Systems

Jim Joyce, PumpTech Bellevue

In our Summer 2013 edition of Pipeline we introduced our new line of dry briquette feeders that use a patented spray technology to maintain a consistent concentration of hypochlorite solution.

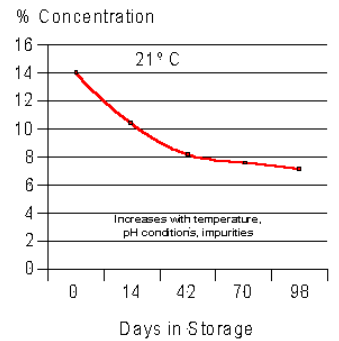
There are several aspects to consider when choosing a feeder. Most relate to the ease of use but, safety and long term chemical stability are two other factors



to consider as well. The Constant Chlor briquettes are shipped in 50 lb, sealed plastic pails and have a very long shelf life. They are also very hard so they create very little dust. This makes filling easy as they can be poured directly into the feeder

storage tank. Because the chlorine concentration of the briquettes is 65%, they require a lot less storage space than liquid bleach. When handling the briquettes there are no liquids to spill so handling is safe and simple. Unlike sodium hypochlorite solutions, which degrade over a short time (see chart), the Constant Chlor system creates hypochlorite solution only as it is needed. This allows the solution strength to remain very stable and repeatable. For more information on our Constant Chlor line, contact you local PumpTech branch.

Product Degradation



Canby Manufacturing - Hydronix & MeterMan

Our Canby manufacturing facility has been busy building pump skids. The picture below shows one of two skids being built for Astoria Energy in New York. They feature 24" Peerless end suction pumps powered by 700 HP TEFC motors. They will be pumping cooling water at the generating facility.

The two photos to the right are part of the 99 skid order that PumpTech built for a new food processing facility in Oregon. The one under construction is a large Vaughan Chopper pump used to transport food waste. The ones above are Cornell clean water pumps. Other skids provided for this job include Cornell food pumps and SIHI multistage pumps. All of the baseplates and coupling guards are welded 304 stainless steel. Good job Canby!



PumpTech PumpChat - From the Presidents Desk

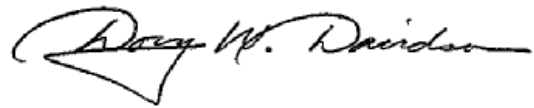
Doug Davidson, PumpTech Bellevue

As I read the various articles within the newsletter I appreciate the new and inventive ways the PumpTech sales, service, engineering and manufacturing teams regularly bring benefits to our customers. Examples of energy savings, reduced maintenance man hours, reduced downtime and environmental improvements as well as operational improvement are all in our winter newsletter.

Working collaboratively with Municipal and Industrial customers, we consistently provide cost effective solutions to complex performance problems. Energy auditing of pump stations is a simple way to determine if a station's performance, longevity or energy usage can be improved. As it was recently said at our annual sales meeting, "you don't know what you don't know". On page 8 of this newsletter you will see a list

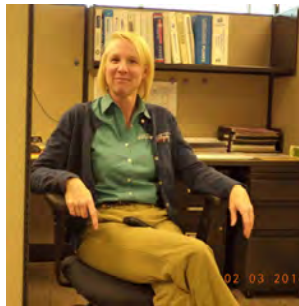
of events at which PumpTech will be exhibiting and presenting our educational seminars. If you are interested in learning more about energy audits or in field pump testing please stop by our booth. We will be presenting our seminar on "Testing Pumps & Motors in the Field" in Spokane and Lynwood, WA and Eugene, Oregon City and Baker City, OR this winter and through the spring and summer.

The PumpTech team would welcome the opportunity of working with you on your next project, energy audit or maintenance challenge. Thanks for taking the time to read our newsletter.

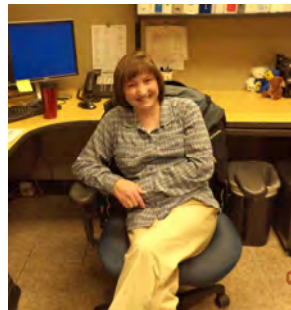


Hellos & Goodbyes At PumpTech

Shawna Andrews joined the Canby sales team in October of last year. She will be managing the industrial sector in OR and Southern WA. She will also have some municipal responsibilities. Before joining PumpTech, Shawna was the NE Regional Sales Manager for Verder.



Toni Gilmore joined the PumpTech, Project Management team in January. She will help coordinate our Packaged Systems projects that are built in Canby. Toni comes to us after a ten year career with Pioneer Pump.



Merlin Hill joined PumpTech, Canby in October as our newest service technician. Prior to joining PumpTech, he was in the Navy where he worked with pumps, compressors and heat exchangers. After the Navy he moved to Mt. Hood where he worked as a snowboard instructor.



Daniel Holloway joined PumpTech Canby in October of last year as our new Shipping & Receiving Manager. He has over seven years of experience in various industries. Dan will also be assisting our shop personnel in various duties.



Zach Weeks joined the Bellevue branch in September of last year as our Outside Engineering salesman. He has a degree in Environmental Engineering and worked as a consulting engineer in Austin and Houston. His specialty was the design of water and wastewater pump stations and treatment plants.



Bob Rosentreter retired from PumpTech in February after ten years of employment. He was the Purchasing Manager for our Canby branch and coordinated the purchase and delivery of all of the components used in our packaged systems.



PumpTech Pipeline - Winter 2014

Publisher **Editor**

Doug Davidson Joe Evans

Editorial Advisory Board

Tom Long, Service

Laurie Beden, Finance

Chris Suskie, Operations

Scott Bush, MeterMan Systems

Ed Smith, Municipal Sales

Mike Shoemaker, Industrial Sales

Jack Boyd, Packaged Systems

Jim Joyce, Process Sales

Mussè Olol, Engineering

Mark Miller, IT

PumpTech Pipeline

A Publication of



Click below to subscribe to the email version of Pipeline
newsletter@PumpTechnw.com

Upcoming PumpTech Participating Events

2/27	LOID Training - Lewiston, ID
3/4	I ESS-AWWA Short School - Spokane
3/10-12	Cascade to Coast Short School - Eugene
3/11-13	Western Boiler Conference - Port Angeles
3/24-27	WOW WETREC - Kennewick
3/25-27	ORWEF Short School - Oregon City
3/31-4/2	Eastern OR Short School - Baker City
4/10-11	WASWD Spring Conference - Yakima
4/17	ASCE Seminar - Yakima
5/7-9	PNWS-AWWA - Eugene
6/3-4	Western WA Short School - Lynnwood

