



What's happening

| o January 2010 o |



DOYON UTILITIES' MONTHLY PROGRESS AT-A-GLANCE

Boiler Feed Water Treatment Process Ft. Wainwright Central Heat and Power Plant

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Rufus Bunch, the Superintendent at the Fort Wainwright Central Heat and Power Plant, recently gave a presentation regarding the boiler feed water at the January Qualitative Management Review meetings that included representatives from DESC, the DPW and Doyon Utilities. This is a topic of great interest because the boiler feed water has a significant impact upon the operation of the CHPP. Due to the significance of this program and level of interest, Doyon Utilities is reproducing the presentation in the form of an article to share with our readers.



Rufus Bunch FWA Superintendent

Doyon Utilities ultimate goal at the CHPP is to continue to improve the water treatment program through the repair, rehabilitation, and replacement of boiler feed water treatment equipment as well as a rigorous and consistent water quality testing program. Through these initiatives, DU will continue to improve the quality of the boiler feed water and condensate quality monitoring throughout the CHPP and district heat distribution system. As a result, the CHPP will run more efficiently.

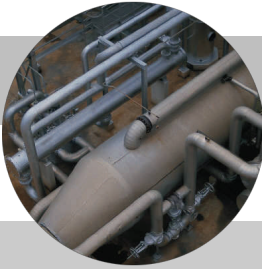
What is boiler feed water? Boiler feed water is the term used to de-

scribe the water processed in steam boilers. This water is heated using coal to generate steam.

How does the FWA CHPP use boiler feed water? Boiler feed water is processed by the CHPP's six coal fired boilers to produce 650 deg F, 425 psi steam. The steam generated is used to produce electricity and heat building spaces. The steam generated at FWA CHPP is evaporated in steam generation tubes inside the boilers. These tubes are about 2 1/4 inches in diameter and each boiler contains hundreds of feet of tubes. In the winter, 4 of the 6 boilers are operating to produce 100,000 lbs of steam/hour each. That's almost 50,000 gallons of boiler feed water being evaporated into steam each hour.

Facts about boiler feed water that becomes steam. Steam generated in the boilers is primarily pure with the exception of some dissolved gasses that might have been present in the boiler feed water. Any dissolved impurities that don't evaporate increase in concentration until they precipitate as a solid. When producing steam at 100,000 lbs per hour a small amount of impurities will produce significant amounts of solids. 1/100 of 1% impurities will produce 1 lb of solids per hour in the boiler tubes.

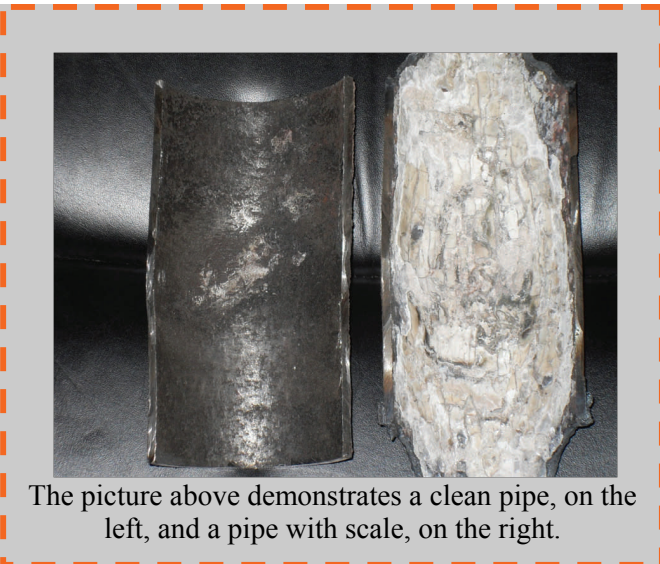
What happens to the solids produced in the boilers? The solids produced can become scale or



Boiler Feed Water (cont'd)

sludge. Scale are solids that adhere to the inside walls of the boiler tubes. Sludge are solids that do not adhere to the tube walls and settles out in the boiler headers.

How do the solids affect the boilers? The solids produced in the boiler interfere with efficient production of steam, become scale buildup on the inside of the boiler tubes which reduce the heat transfer rate through the steel boiler tube wall, and become sludge which reduces the natural circulation of water between the boiler tubes and headers in the boiler.



The picture above demonstrates a clean pipe, on the left, and a pipe with scale, on the right.

Why does the CHPP place such importance on boiler feed water quality? Boiler feed water treatment strategies can greatly influence the operation of the boilers. Removal of dissolved gasses in the boiler feed water, especially oxygen, minimizes the formation of solids in the boilers which is a must.

Where does CHPP boiler feed water come from? Potable water or raw water from wells is treated to become boiler feed water at the CHPP. DU undertakes a significant treatment process to produce boiler feed water. The following impurities are removed during the treatment process: oxygen, calcium and magnesium (hardness), and silica. Impurities not removed before the boiler feed water enters the boilers are controlled in the boilers by additional chemical treatment, continuous automatic blowdowns, and manual blowdown of headers.

What does the boiler feed water treatment at FWA CHPP include?

- Testing of the boiler feed water for the level of oxygen in the boiler feed water to determine the effectiveness of the deaerators and oxygen scavenger in removing oxygen from the feed water and for the control of scaling elements in the boiler feed water.
- A reverse osmosis filter program that provides regular performance monitoring and properly timed cleaning.
- A polishers program that provides proper operation of the polishers including regular subsurface backwashes and proper regeneration cycles and regular testing of the boiler feed water after it leaves the polishers.
- Removal and replacement of the resin in the three polishers that treat the condensate returning from the steam heating distribution system.

Silica	Hardness
Alkalinity	Conductivity
Sulfite	Ph
Chlorine	Dissolved Oxygen
22310	Iron

- The following water quality tests:

Progress! Doyon Utilities has made significant progress in the quality of its boiler feed water through its plant upgrades and procedures. Conductivity is one way of measuring impurities in boiler feed water. Daily conductivity tests are performed on the boilers which continue to document the improved operations. Doyon Utilities looks forward to its continued efforts in this area.

Questions about this article may be addressed to Rufus Bunch at duinfo@doyonutilities.com.

Site Specific Happenings

Fort Wainwright

- The new utility service to Building 2081 was completed. This new service included a direct bury steam/condensate, water and wastewater line to the existing utilidor.



The single phase primary electric metering for the Birch Hill X-Country ski trail system was completed.

- The new electric services for the traffic signals and intersection upgrades at Meridian/Neely Ave & Meridian/Montgomery Ave were completed.
- A new three phase electrical service to Building 2109 as part of a DPW upgrade was completed.
- The installation of a new 400 amp transfer switch for the standby generator at Building 1060 was completed
- A electrical service to a new building at the FWA Range was installed.
- New three phase electrical services for HBO panels at Buildings 4144 & 4146 were installed.
- The system wide replacement of street light bulbs and ballasts are on going.
- Hydrant flow testing was conducted at the new Stryker Wash Facility during the commissioning of the new water main to verify flow rates to the building.
- The FTW 339 Stryker Wash project is 95% complete. The contractor will return in the spring to

complete the remaining backfill and landscaping. Work was terminated for the season due to cold temperatures.

- PDC has been awarded the engineering design work for the North Post dead end project. Jacobs Engineering was contracted by the DPW Environmental for soil sampling along the proposed direct buried pipe route. Holes were drilled and soil samples collected and sent off for analysis. Results came back positive for diesel and gasoline range organics. Project deferred until spring 2010.
- Water Treatment Plant (WTP) Backup Generator: Randy Miller of EPS and a team of engineers examined the generator and developed a list of items to be inspected by NC Machinery. NC is preparing a quote for the inspection.
- The two utilities piping insulation projects are complete. TCI started on the laterals to Bldg 1054 project on 9/1/09. They are essentially 100% complete and ready for walkthrough and closeout. CEI is the contractor on the MH E6-6-5 to E-6-6-7 project. They have finished the project and will be back in the spring for minor landscaping work.
- Bear Paw Demolition is 100% complete.
- FTW 350 Utilities Demolition is 100% complete.
- West North Post Tie line is 100% complete.
- New Black Start Generator: Warranty work continues on the dampers. The original dampers were not built substantial enough for the arctic conditions experienced in the interior of Alaska. Caterpillar (CAT) has contacted a local damper fabricator to investigate and suggest improvements.
- New Turbine Governors Project: The design work has begun. The design team visited the CHPP to collect additional information on the existing equipment.
- New Automatic Voltage Regulators Project: The design work continues. DU has received some basic one line drawings to begin the review process.



Site Specific Happenings

Fort Greely

- Potable Water System AAAF: The tank fabrication is complete. A competitive solicitation for mechanical piping is underway. The piping project is expected to begin in February.
- Upgrade Plant Fuel System: TCI has initiated the project by ordering materials, preparing shop drawings, and forwarded design clarification/variation request (DCVR). Materials have arrived in Fairbanks for shop painting and fabrication. Expect TCI to begin on-site by January 11, 2010. The completion date is March 31, 2010.
- Post Condensate Study: Initial non-destructive testing (NDT) of steam and condensate lines post wide are complete. DU received reports of corrosion in welded joints. Additional testing will be performed under the direction of the site manager.
- Steam/Water Main Upgrades RCI Housing: The project will be bid in January for construction in Spring 2010. New completion date of September 2010.

Look for updates on Fort Greely's "Biggest Loser" competition on page 6.



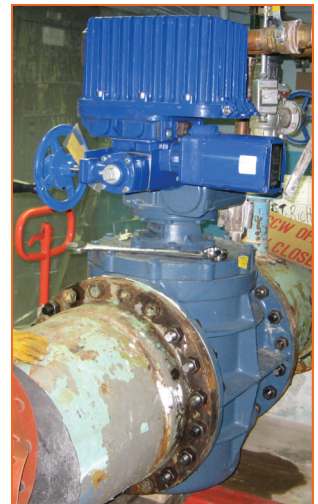
- Install Redundant Lift Station: The building is complete. The pumps are set and all mechanical work installed. The exterior portion of electrical work is 100% complete. The interior electrical is 85% complete. Start up during 2nd week of January 2010. The new 80 kW generator arrived late December. Duct work is being fabricated for cooling, exhaust, and combustion air. Expect it operational by end of January 2010.

Fort Richardson

- Construction on the Water Treatment Plant Master Valve replacement is complete with the SCADA portion continuing.
- Feeder 3&6 Voltage Conservation: Construction of the feeder conversion scheduled for 2009 has been complete and the job closed. Transfer of services to the new higher voltage feeders was finished by the end of October. A new Purchase Order will be issued for the remaining underground portion.
- Job Corps will be placing two apprentices at FRA. One will be assigned to the water treatment plant and is expected to remain for six months. The other will be assigned to the water/wastewater field crew. The assignment is expected to last for one year.



BEFORE



AFTER

Safety Matters

Eye Safety

The Bureau of Labor Statistics (BLS) estimates that American businesses cumulatively spend upwards of \$450 billion every year on approximately 70,000 workplace eye injuries. This is a major reason that the American Academy of Ophthalmology (AAO) has declared February as Workplace Eye Safety Month. Workplace Eye Safety Month is about preventing eye injury in the workplace.

Have you scoped out potential dangers that could cause temporary or permanent eye impairment at your workplace? Simple ignorance of the risks and the required protection is responsible for many workplace eye injuries. BLS says many injured workers, when asked after an accident, report that they didn't realize eye protection was necessary in the situation. By taking sufficient steps to prevent eye injury during this Workplace Eye Safety Month, you can educate and protect yourself and your fellow employees from damaging their eyes!

Even if you work in front of the computer all day or work in the construction industry, eye problems can

occur at the workplace. Some common causes of eye injury or eye strain are flying objects, particles, chemicals, exposure to excessive bright lighting, and computer vision syndrome. Both workers and employers should take the proper steps to reduce the risk of eye problems. If you work at an office, you may sit in front of a computer for the majority of your day. Doing eye relief exercises, using proper lighting, minimizing glare, and upgrading your computer display/monitor are just some steps that can be taken to prevent eye strain and fatigue to decrease work errors and increase productivity. If you work in landscaping or construction eliminating hazards before you start work and using proper personnel protective equipment like eye protection will help to decrease your chances of an eye injury that could result in temporary decrease in vision, blindness, or possibly something worse.

Take the time to protect yourself and your employees through workplace safety education during Workplace Eye Safety Month.

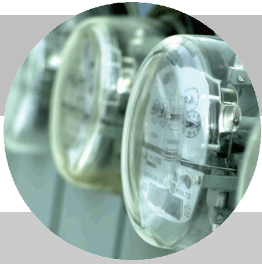


Employee News

Standard Insurance 401(k) Withholding: Your next opportunity to change your 401(k) withholding is April 1. The deadline to submit change forms is Friday, March 26. Questions? Call Martina or Dave at 455-1500.



Employee Contact Information: Have you moved or have a new emergency contact? It's important to notify human resources if your contact information has changed. Please contact your site administrative assistant for the appropriate form.



Miscellaneous Happenings

Congratulations



Congratulations to Christopher Shier for expanding his knowledge. He received his boiler license class three in the month of December. Christopher is a Utility Fitter/Mechanic at the Fort Wainwright Central Heat and Power Plant.

January Birthdays



Warren Howard
David Swingley
Mitchell Popa
Christopher Shier
Sam Fitzpatrick
Chad Nusunginya
David Dawe
Bill Farrell
Brandi McCullough
Amber Nelson

Oops!!! Melissa Lund's Birthday was in December.

FGA Biggest Loser

Yes, a spinoff of the popular television reality show is currently taking place at Doyon Utilities' Ft. Greely site. Organizers of the competition list their goal as "becoming healthier and getting their bodies in shape". What a great way to start the new year and the participants have had tremendous success. The "Biggest Loser" title will go to the person with the greatest percentage of body weight lost during the competition.

The program is strictly voluntary with 10 Doyon Utility participants and two Department of Public Works Quality Assurance personnel actively participating. It takes great courage each week to "bare your soul" so to speak when you climb on the scale to let the other participants know how many pounds have been lost since the last weigh-in but none have shied away from the exposure. The contest started on Monday, January 4th and will continue officially until Friday, May 21st. There are weekly prize winners and the grand prize winner will be crowned on the final weigh-in. Participants are contributing a token amount each week to participate and the weekly winner receives half of the weekly contribution with the remaining half going into the grand prize kitty. The grand prize winner will also receive 50,000 Alaska Airline miles donated by the Company. Unfortunately, the winner of the airline

miles must be a DU employee--much to the chagrin of the two DPW participants.

While it would be impolite to list names of the participants it is safe to say that they represent a cross section of our employees. It is doubtful that they are only being motivated by the prize at the end. They have taken the challenge seriously and as a group they have already lost 117.2 pounds during the first 4 weeks of the competition. While someone may be designated as the "Biggest Loser", there are only "Winners" in this program. We applaud their efforts to become healthier employees and the real success is in the numbers of pounds already lost. Keep up the good work.

