CLATSOP ROUNDHOUSE

Newsletter of the Astoria Railroad Preservation Association, Incorporated Summer 2010

From The Cab

"We're still here and doing it"

It's been way too long since we've put out a newsletter. We have been so wrapped up in the restoration, that we allowed ourselves to neglect the newsletter, and thus informing you, our supporters and (emphasis) benefactors, of our progress. This should not happen, and will not happen again. Rest assured however, work has continued faithfully - with monumental achievements.

Work is progressing toward the final stages. I hope this newsletter will give everyone an idea how close we are to nearing the goal, that is having # 21 steamed-up and pulling a consist of passenger cars, up the Columbia and back, show-casing our beautiful and historic locale. Please read this newsletter, visit the website, or better yet, come down and see for yourself what we've done. We have accomplished a lot, are getting close and it shows.

We spent 2+ years working on the tender. We had a time limited grant from the Oregon Community Foundation for the tender, and we completing our obligations with great success.

Many locomotive restoration projects leave the tender for last and when they finally get around to it, find it requires more work than was originally thought. We now have a virtually new tender and all we have to do is "couple it up". A special thanks to the OCF for those grant monies.

Since completing the tender we have spent our efforts between the boiler and the running gear. As a result, most of the work on the running gear is completed. We are very close to putting the drivers under the frame. Work on the boiler is progressing, but we need money to finish. When we started the "Tube Drive" we calculated that by selling shares for all of the 169 tubes and the 28 flues, we would have enough money to complete ALL the repairs to the boiler, i.e. replacing "rotten" boiler sheets, building a new firebox, new stay bolts, caps and sleeves, as well as purchasing and installing the tubes and flues. That basically stands true today. All of that work (except the tubes and flues) is now done or in the final stages.

Now to seal up the holes that are left, we need to purchase and install the actual tubes. If we can sell the remaining shares for tubes and flues we will have enough money to actually purchase them, our next step. Quotes for the required tubing are coming in at the $10,000 range.

So, we need your help, in many ways:

We need you to purchase the remaining shares for tubes & flues ($100 and $500 respectively) so we can order the tubing before the price of steel goes up again. If this is beyond your price range (the recession has hit us all hard), please send in your $25 to renew your annual membership dues. We haven't asked in a long time and every membership helps a lot. Remember, these donations are tax deductible. If you are not a member, please join us now.

And just as important, we need your physical help as well with the restoration. We can always use mechanics and machinists, but just as important we could sure use secretaries, accountants, and helpers, etc.. We have lots of work for persons of all ages and walks of life.

Please join us at the benefit at the Liberty Theater on July 17th. If you can't, keep us in mind and send in your tax deductible donation to help keep us going. Also check in with our website at www.astoriarailroad.org to keep up with our progress.

Thanks,

John Niemann, President ARPA

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Boiler Inspected by FRA

Last December, we were privileged to a courtesy inspection of our boiler repairs by Gary Groff. Steam Locomotive Inspector for Federal Railroad Administration Region 8, Before we installed the new firebox, we felt it was it was imperative to give the governing authority an opportunity to inspect our work. Some parts of the "pressure space", specifically the area between the firebox and the boiler are simply not accessible with the firebox and stay bolts in place. Having the firebox out, gave Gary an unique opportunity to check these otherwise inaccessible spots. Please note that once the firebox is installed, the only access to the interior of the boiler is through the steam dome at the top of the boiler, a small opening only 20 inches in diameter.

Inspecting the boiler

We spent several hours together as Gary scrutinized the boiler and our repairs. He came to the conclusion that our repairs and documentation more than meet the required standards and we were given a green light to install the new firebox. A special thanks to Gary for coming down to Astoria to visit our project.

Work Resumes on Boiler

After the FRA inspection of the boiler last December, we installed the new fabricated firebox. This process involved lifting the entire boiler about 4 more feet in the air, then rolling the firebox under the boiler (utilizing sections of 4 inch pipe as rollers). The boiler was then lowered back down to a convenient height for riveting the mud ring.

The firebox goes in

We first attached the mud ring to the firebox via several "line up" pins. The firebox/mudring combination was then raised to its proper position in the boiler and bolted in position through the rivet holes. This was quite a snug fit and required the fabrication of some rather innovative tools to get all three pieces to line up perfectly.

When we fabricated the firebox, we did not have the boiler blueprint for #21 and all our measurements were meticulously taken off the old firebox. We have since obtained the boiler blueprint. (Many thanks to the Santa Maria Railroad for providing us a copy from their vault). When we had everything bolted up, we checked our "as installed" measurements against

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the print and found we differ at the most 3/16", well within the tolerances allowed for locomotive boilers.

The next step is to rivet the firebox to the boiler through the mudring. Since #21 burns oil and not coal, the heads of the rivets on the inside of the firebox are a countersunk oval head form. This is because the inside of the firebox is lined with fire brick up about 2 feet and a standard button head would prevent the brick from laying against the sheet. To countersink the holes for the rivet heads, we built a special piloted tool that cuts down on "chatter" during the cutting and uses a replaceable carbide insert as the cutting edge. Thanks to Bruce Hall for the CNC milling of this tool and to Stack Metallurgical for heat treating it.

Countersink tool at work

We have countersunk all of the 240 large rivet holes and have also measured the volume of each hole to ascertain the length of a 7/8"rivet required to completely fill the hole. The holes are 1/16" larger in diameter than the rivet to facilitate insertion of the red hot rivet and extra length of material must be included to completely fill the hole when it is squished.

To squeeze the rivets, we are fabricating a hydraulic "bull riveter". This is basically a very beefy c-clamp capable of exerting over 100 tons of force. The advantage of the bull riveter, is that besides squeezing the rivet and forming the heads, it also holds the plates together while the rivet cools. Remember, these joints are metal to metal with no sealant and rely on no gaps between the pieces to make them steam tight. The riveter will be ready in the next week and we should have all the rivets installed shortly thereafter. We have all of the required rivets.

Once the mudring is steam tight, we will start on the installation of the 1300 stay bolts. We will explain this on our web page in the "Work Photos" section. All of the stay bolts except the long crown stays have been forged and machined and are ready to install. The 300 required sleeves have also been machined and the installation tools have been sharpened and ready to go. We do not anticipate this to take very long and should be complete by the end of summer. We will then need the tubes to finish the Boiler.

FRA Form 4 Completed

The FRA requires a Form 4 to be completed for railroad boilers. This form contains calculations set forth by the American Society of Mechanical Engineers to determine safe boiler operating pressures. The manufacturer did this when the boiler was new, however new regulations require a survey be taken of the various boiler components in regards to their current thickness and position and use these measurements, in the calculations to determine the safe operating pressure. The math required is very involved. Jon Brewster of Monmouth Oregon has calculated the majority of Form 4's in the NW kindly volunteered his services. The new Form 4 is very impressive. The good news, after all our repairs, #21 is good to go at her original operating pressure – 200psi.

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Restoration of the Tender

Most of the recent work during the past 3 years has been on the tender. The tender or "coal car" is the car immediately behind the locomotive that carries the water and fuel needed to make the steam that powers the locomotive. In the case of #21 the fuel is oil rather than coal and there are separate water and fuel tanks.

Water Tank

The original water tank didn't have a coating on the inside and it had spent many years outside without care or fresh paint. As a result the water tank was full of holes. There were so many that patching would have been very time consuming and we would also have to repair new leaks constantly. There were also dents from lifting the tender off its wheels.

Consequently we choose to build a new water tank using the same riveted construction as the original. The 6,000 gallon tank has about 3,500 rivets to hold the metal plates together. Each of the rivet holes had to be laid out, drilled (in three steps up to about 3/8 of an inch) then reamed to final size. Finally hot ½ inch rivets were installed. The local high school ESD metal shop class at MERTS helped with this process.

After the tank was assembled, it was sandblasted inside and out. A zinc primer was applied to the outside and an epoxy based tank coating was painted on the inside. For final painting, Dan Hess provided a semi-truck to move the tank to the Lektro Company at the Astoria Airport where they have a paint booth large enough to paint the 26 foot tank. (Lektro builds aircraft tugs for use worldwide). In the booth, painter Kelly Stidham was able to spray the tank and bake the DuPont Imron paint on at over 180 degrees. Crane service was provided by Bergeson Construction and Sopko Welding.

Fuel Tank

The fuel tank had much less corrosion than the water tank since it was partially full of oil, so we have been able to restore it. First it needed to be cleaned inside and out. Keith Grimes did quite a bit of the inside cleaning. The engine burned a fuel oil called Bunker C which is pretty similar to road tar. There was several inches of this fuel left in the tank. In addition, sand and silt had gotten into the tank over the years so it was a sludgy mess. We also had to replace about 50 rivets in the back of the tank where debris had accumulated and badly corroded them on the outside.

Casey removing corroded rivets

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Once the tank was cleaned and the outside sandblasted we took it to Lektro where once again they provided the use of their heated paint booth and Kelly Stidham painted the outside of the tank with Imron. A special thanks to Kelly and Lektro for the painting of both tanks.

Inside the tank are several control valves and a number of steam coils that are used to heat the bunker oil so that it will flow to the locomotive. There was no way access the valves for servicing. For instance, one set of the heating coils was permanently welded in place around an oil valve. We made this coil movable so it is possible to service the valve. Other heating coils on the floor of the tank suffered freeze damage in Snoqualmie and were leaking and so had to be removed, these coils will need to be replaced and the 1¼" pipe for these coils will cost about $200. Once these are installed, the tank will be mounted on the tender.

While it may be hard to believe, tender restoration work is about as time consuming as work on the engine itself and finally it is just about complete. Having a complete tender, ready to roll, is a very big step.

Tender Frame

The frame had been bent as a result of a hard coupling in the past. So we fixed the bends. The frame was sandblasted and painted. As originally constructed the frame had large wood bumpers front and rear. However sometime after the frame was bent, the rear bumper was replaced with a steel beam. After the frame was fixed the bumper was crooked. A Job Core Student from Tongue Point welded up the old bumpers bolt holes, then new holes were drilled.

A steam heat pipe runs under the tender to provide heat to passenger cars. Some fittings needed to be replaced, new brackets were manufactured and fitted and new insulation was applied to the pipe. Portions of the signal and brake pipes were also replaced and the pipes reinstalled with new fittings. The brake cylinder was rebuilt with new seals and the dump valve was also rebuilt.

An item of special interest is that our coupler casting has two pockets, one for standard gauge the other for narrow gauge. A second coupler mounted in the narrow gauge pocket would be used to switch narrow gauge cars on dual gauge track at the interchange with a narrow gauge railroad.

The Tender Frame

Tender Deck

The water and fuel tanks sit on a wooden platform that sits on the tender frame. The wood is sandwiched between the tanks and the frame. New fir planks were planed to specific thicknesses to take into account the depth of frame cross members they rest upon. Divots were drilled in the bottom of the boards so they would clear rivet heads. Openings were also cut for the various through deck fittings. Thanks to Todd Dowabilty for the loan of us his industrial planer to plane the deck boards.

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Tender Trucks

The tender trucks were completely rebuilt, which meant complete disassembly, sandblasting and painting. The spring planks got lots of attention. The pedestal rivets were loose, one was even missing, new spring keepers were riveted on. The springs were load rated in a press and arranged so they will carry the load evenly.

The bronze and babbitt bearings were fitted to the axles. New lubricating pads and inside dust seals where installed.

Running Gear

During the inclement weather months, work continued on the "running gear"

A sample list of accomplishments is as follows:

Connecting Rods– re-bored & polished - done

Driving Boxes (the main bearings)- re-babbitted & bored –done

Driving wheels- axles ground, hubs machined – done

Shoes & wedges (hold the axles in the correct fore and aft position) – done

Wrist pins (50% machined) - Once the wrist pins are completed and installed in the drivers, we can fit the drivers to the frame for the first time since 1972.

Sandblasting Completed

With a big push last summer we finally got all the sandblasting done. Many folks helped with the work. Sandblasting is a nasty, dirty job and Dave Starr deserves special thanks for the many weeks he spent in the large temporary sand blast booth we set up at the Port of Astoria boatyard. Dave has previously been employed as a sandblaster and he was able to get a lot done in a short time while maintaining a high standard of quality.

Ken Smith of the Port of Astoria was very patient with us and the long process. Without the use of the boatyard, the sand blasting would not have been possible on the scale that was required. Special thanks to Ken and the Port. Thanks also to Art Schwiezer at Green Diamond Sand of Portland who provided garnet sand at half price.

We still have the rubber room (sandblast booth) in the engine shop to take care of any new parts or small ones that we missed.

Boiler Tube Drive Continues

We need to fill a few holes in the boiler.

The reality about restoring a steam locomotive is that it takes a lot of money. This is certainly the case for #21. Folks have been very generous and we have raised over one hundred forty thousand dollars in the last twelve years for our restoration efforts. At this point, we've completed well over half the work, but a very expensive part of the project – putting in the tubes and flues – is coming up soon.

Please help us fill in a few missing holes:

Tubes - $100 ea.

Flues - $500 ea.

Let's finish this off!

As a little extra incentive you will be buying yourself a souvenir of the project. When we install the tubes there will be remnants of the material left over.. We will mount a section of the tube on a base and attach a placard denoting the "parent" tube's position in the boiler. You can proudly display your authentic piece of #21 for friends to admire. Buy yours today and help put #21 back in steam.

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Eagle Scout Paints Caboose

In the summer of 2008 we saw a cooperative effort to spruce up ARPA's Oregon Electric caboose #026. Situated adjacent to West Marine Drive in Astoria, the caboose is on static display. The Uniontown Association enlisted local Boy Scout Travis Gaydos of Troop 211 to spearhead the new paint job. The task was taken on by Travis as a community service project to help achieve his goal of becoming an Eagle Scout. He first presented the idea to the local Boy Scout Council to obtain approval and then worked out the details for manpower, tools and materials.

The work began with ARPA member Keith Grimes preparing the wooden caboose by pressure washing the worst of the old paint flakes away. Some additional wire brushing, sanding and caulking prepared the wood for paint. Travis Gaydos enlisted the services of fellow scouts, family and friends to help put a new coat of paint on the caboose. While the original color scheme was probably yellow, this time around a traditional red with white and black trim was chosen.

Thanks to Travis Gaydos of Troop 211, caboose #026 will look beautiful for future generations.

ARPA Website is Back On-line (www.astoriarr.org)

The ARPA website is on line again.. Our former web host went out of business and our original web master passed away. Gaining access to our URL was a bit of a nightmare that no-one could figure out. Finally ARPA member Lawrence Hillier was able to restore access. Since we again have access to the site, member Mark Clemmens has been updating recent "work-in-progress" photos.

SP&S Passenger Car #273 Covered Again

During the Advent day storm the tarp covering ARPA passenger car SP&S #273 was ripped off. This gave many folks a chance to see what the car looks like. We were very surprised by how many folks were stopping to look and take pictures. We imagine there were many more when we were not around. Thanks to AGBAG for providing us with a large silage bag to use as a cover for the car. And thanks to the crew that came out for the special work party to wrap it up.

ARPA Benefit!

and Historical Presentation

Saturday
July 17, 2010
7pm
Liberty Theater
McTavish Room

Everyone is welcome! Catered refreshments and a no-host bar.
Call 503-325-1900 to let us know if you plan to attend!

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