Renovation of the 2926 crosshead assemblies turned out to be a bit more challenging than originally estimated. But first, let us look at the functions and primary parts of the crosshead assembly. Like many other steam locomotives, 2926 has two cylinders—one on each side of the locomotive near the front. In the case of 2926, those cylinders are part of the massive cast frame. Their location places the two pistons well ahead of the locomotive’s eight huge drive wheels.

The left and right crosshead assemblies connect the pistons to the main drive rods on their respective sides of the locomotive. On 2926, the main drive rods connect to the second drive wheel on each side. At the drive wheel the pistons’ horizontal movement is converted to rotary movement. That rotary movement is then transferred to the other drive wheels via the other side rods.

The primary elements of the crosshead assembly, including the ones that needed attention are: 1) The crosshead guide that attaches directly to the frame of the locomotive; 2) The crosshead shoe that moves horizontally on the guide carrying the crosshead body; 3) The crosshead body that connects the piston rod to the main drive rod.

The crosshead body is the most complex portion of the assembly. It’s split housing bolts directly to the shoe. On the front, it holds the piston rod, and at the rear, the main drive rod. In addition to transferring the piston’s horizontal motion to the main drive rod, it has a large bearing, and also connects to the locomotive’s timing system. The big bearing was sent to the manufacturer, Timken Bearing Co., for professional inspection and maintenance.

The guide and the shoe refurbishment presented a different challenge. The shoe needed Babbitt replacement and machining to allow smooth movement on the guide. The Babbitting process was beyond the Society’s capability. At that point, those parts of the assembly were hauled to the GCRY shop in Williams AZ.

Upon arriving at the GCRY shop in late 2012, an initial inspection revealed that the guides were slightly bent. The GCRY had the capability to straighten and realign the guides, but they needed the entire crosshead assembly to properly align the guides once they were straightened. Rick Kirby and Bob DeGroft quickly loaded other crosshead assembly parts and hauled them to Williams so all the assembly parts could be properly matched for smooth action. (See newsletter Vol. XII, No.1, pg 4 on the NMSLRHS web site for pictures of the work on the guides.)

Once the guides were straightened and re-machined, attention turned to the shoes and a new challenge. The new challenge was metallurgical in nature, and related to the process of applying the Babbitt alloy bearing surface to the shoes. The shoes are aluminum. The Babbitt is an alloy of several metals with differing hardness, (most often Tin, Lead, Copper and Antimony). It cannot be applied directly to the aluminum because of potential corrosive reaction and poor adherence. References referred to ‘tinning’, plating the aluminum with tin, as a solution to this problem.

Continued on Pg 2
Attempts to apply the tinning did not produce good results. The GCRY machinists suggested using an organization with more metallurgical expertise. The shoes were then taken to Horizon Metals, Inc. in Tempe, AZ to address the metal-matching problem and to apply the Babbitt to the shoes.

Instead of tin, copper was chosen as a base for the Babbitt. However, the process of plating copper directly on aluminum can also be problematic, and not as durable as desired. Horizon metallurgists solved that. They first applied a nickel plating to the shoes, with copper plating over the nickel. The Babbitt was then applied to the shoes, and they were returned to the GCRY shop in Williams for machining to an exact fit to the Crosshead Guides.

GCRY machinist Helmüt Plätzer handled the crosshead restoration. He did a great job straightening and machining guides and an equally fine job machining the shoes for smooth movement on the guides.

After the months long saga of the crossheads restoration, there are several folks who hope the rebuilt shoes run a lot of miles before another rebuild is necessary. The NMSLRHS volunteers logged a lot of highway miles getting this rebuild done. Between December 2012 and the return of the crossheads this summer, there were repeated trips between Albuquerque, Williams, and Tempe. On the other hand, it would have been much more difficult and expensive if we didn’t have some good neighbors in Arizona.

The return of the crosshead assemblies (pictured below) is not the end of the story on this part of the 2926 restoration. There is a lot of heavy lifting yet to do to reinstall the crossheads and those extra heavy main drive rods. Though they may not involve as much heavy lifting, there are still several other tasks before the power source (pistons) are connected to the tractive force (80 inch drive wheels). Those tasks include honing the cylinders, installing the pistons and trampling the locomotive.

Tramming (mechanical aligning) rods, wheels, and valve gear is critical to efficient, reliable operation. The locomotive must be properly trammed to log a lot of miles with low wear on those pesky crosshead shoes. Look for ‘Crossheads, Chapter 3’ in a future newsletter for details on cylinder honing and tramming.
THE SANTA FE RAILWAY IN TEXAS

W. H. (Bill) Giesenschlag, NMSLRHS Member, Somerville Texas

The lines of the BNSF Railway in Texas began in the 19th Century not as the Atchison, Topeka and Santa Fe Railway (AT&SF) but as an entirely unrelated company called the Gulf, Colorado and Santa Fe, (GC&SF) starting in the city of Galveston.

In 1870, Texas was a frontier area. Galveston, its largest city and commercial capital was on a coastal island. As the port city for Texas' growing cotton empire, it was very wealthy. Galveston's only mainland rail connection was to Houston, a fast growing town 50 miles to the northwest. Houston was beginning to challenge Galveston's supremacy as the leading Gulf Coast city.

In the summer of 1867 there had been a devastating yellow fever epidemic along the coast and Houston had embargoed traffic coming up the single rail line from Galveston. Houstonians learned that this was an effective tool in their economic war with Galveston. Every time there was any talk of an outbreak, Houston embargoed the rail traffic.

Galveston businessmen decided that, to maintain their city's position, they must have their own rail line into the interior of the country. Thus the Gulf, Colorado and Santa Fe was born. It would start from Galveston, build across West Texas to the mining center in Colorado, and to the always mythic attraction of Santa Fe, New Mexico. It must not pass through Houston or Harris County.

The new company was incorporated by the Texas Legislature in 1873. Financing came slowly, and track laying began at Galveston in 1877. Brenham (MP 126) was reached in 1880. By 1881 the mainline reached Belton, with a branch northward from Temple to Fort Worth. Along the way, numerous stations were named for the Galveston men who were officers or investors in the road: Rosenberg, Wallis, Sealy, Somerville, Landes, Rogers, Heidenheimer, Temple, Moody, Kopperl, and Kempner.

The GC&SF never became the moneymaker its backers had hoped. Local Texas traffic was insufficient, and there was a lack of friendly interstate connections. Texas in the 1880's was dominated by Jay Gould's network centered around the Missouri Pacific and the Katy. After filing for bankruptcy, the GC&SF was bought by George Sealy, one of its own directors. Sealy quickly sold the company to the AT&SF. The AT&SF bought it on the condition that a connection be made with their line in the Indian Territory (IT). This was effected at Purcell, IT in 1886.

Because the Texas Constitution required that railroads operating in the state must maintain their general offices in Texas, headquarters remained in Galveston until 1965 when the US Supreme Court voided this requirement.

The (AT&SF) made significant improvements to the GC&SF. In about 1898 to 1900 line changes straightened out tight curves, fills and stone arch bridges replaced timber trestles. The first division point north of Galveston was moved from Sealy to a new facility at Bellville Yard (MP 106). Temple became the headquarters of the Southern Division, also with a new AT&SF employees hospital that eventually grew into the now nationally known Scott & White Hospital System. A massive shop complex was built at Cleburne and a large creosoting plant was built at Somerville to provide treated ties and lumber. Another treating plant at Albuquerque, NM was consolidated with this facility in the 1960's.

In 1912 the Coleman Cutoff was completed across the middle of Texas, forming a new route from the Gulf Coast to the new Belen Cutoff at Clovis, NM and thus a route from Texas to California competitive with Southern Pacific's Sunset Route.

Even so, the "Gulf Lines" remained somewhat of a backwater of the Santa Fe until relatively recent years. There was no double track and none of the biggest steam locomotives ever operated there. No one saw a 4-8-4 or 2-10-4 on the GC&SF. In the diesel era, this was the last place that 100-Class Ft's ran—in 1966.

Gradually, since about 1970 the former GC&SF has become more like the rest of the Santa Fe, and now the BNSF. The mainlines are CTC dispatched and the same 3rd generation diesels run here as elsewhere. Unit trains of coal, grain and intermodal predominate. Some days, the old GC&SF mainline between Temple and Somerville tops 40 trains a day.

With those former GC&SF line improvements, AT&SF 2926 would be at home here as well as other parts of Texas when she returns to the rails.
Once upon a time the Bureau of Indian Affairs (BIA) had a short rail spur built in the old Albuquerque Sawmill area. Date nails in the ties revealed that it was built in 1937. It was attached to a longer spur connected to the AT&SF main line ¼ mile east. That spur, called the Sawmill Spur provided rail service to the sawmill business district and Old Town Albuquerque. The new spur allowed rail freight to be handled at a loading dock on a BIA warehouse in the 1800 block of 8th St. NW. Sometime later the BIA spur was extended west in an (unfortunate) “S” curve to reach a loading dock at the newer Government Services Administration (GSA) warehouse on 12th St. NW. Concrete slab surrounded the extension. The older portion of the spur remained as originally built.

In January 2002, seeking a home for the 2926 restoration, we found the spur reaching from 8th to 12th St. NW. The older portion was overgrown with brush but the entire spur was intact. Congresswoman Heather Wilson went to bat for the Society. Official agreements with the BIA and GSA to let the Society use that spur followed. It thus became a Repair In Place (RIP) site for our ambitious effort to bring AT&SF back to life—but first the RIP site demanded a little bit of attention.

That attention amounted to the job of clearing brush, cactus, weeds, and assorted trash from the site by some guys who thought their volunteer job was to work on a locomotive. The volunteers set to work clearing the original spur. It was not in great shape. In addition to all the brush and trash, the rails were actually buried at several points, and ties so rotted as to be invisible.

Finally, in May 2002 the site was cleared, and the rails uncovered. AT&SF 2926 was pushed by a BNSF diesel locomotive slowly and carefully across the older portion of the spur to the concreted portion with the challenging “S” curve.

It is not clear when the last box car rolled on this track. From the serious tilt of 2926 as it was pushed into the site, we knew the spur would someday need attention, but developing an infrastructure and getting the 2926 restoration underway came first.

The RIP site was improved greatly over the next 12 years with storage, machine shop, tool shop, and administrative buildings installed in trailers, transportainers, a crew shack, and a refrigerated box car. Three phase power was installed. A work pit and a crane were built. Two donated fork lifts, a car mover, air compressors, and fabrication tables were renovated.

**A NEW SPUR FOR THE 2926**

**OR**

**“I LOVE THE SMELL OF CREOSOTE IN THE MORNING“**

By Mike Hartshorne
Next came our machine shop with two metal lathes, a milling machine and related tooling. Air, hydraulic, electric and hand tools were gathered. Donations included hazardous materials cabinets, pumps, hand carts, welding equipment, work shades... the list goes on and on. Work on the 2926 requires a small industrial facility and the Society put it together piece by piece. But the track under 2926 was ready to fail. Gauge rods had been installed years ago as a temporary measure in the worst spots. Sinking track over rotten ties could not be ignored. Our locomotive might have gone on the ground.

Just in time an anonymous angel decided to help. With a gift of $100,000 in hand the Board of Directors decided in late 2013 to contract for rebuilding that spur. This wasn’t an easy decision. Some folks wanted to spend the money on the locomotive. Maybe the track would hold up a little longer and would not be great to have 2926 running a bit sooner?

Frank Gerstle and Don MacCornack agreed to run the job. It took one false start to establish that the Society did not have enough money to build both an engine shed and fix the track. The track work would have first priority. Soil testing was professionally done at intervals along the spur by the Geotech Company. With that and Frank’s survey of the track Don did the civil engineering plans and a contract was let with Klinger Constructors.

For the duration of the project the GSA kindly agreed to let the 2926, tender, and the car mover be stored along their loading dock west of the RIT site. In May, 2014 the project began with demolition of the old rails and ties from the southeast corner of the GSA loading dock to 8th Street. As they were ripped up the old ties were called a lot of names. Toothpick is one of the few polite ones. Some were so rotten they could be broken by hand. Bent gauge rods were dug up. Their condition revealed that it is a wonder that a million pounds of locomotive had not already settled onto terra firma.

As much rail and hardware as could be saved for reuse was cleaned up and stored by the on site volunteers. New rail joiners, tie plates, and spikes were ordered by Klinger. (Later, a change order was needed for some replacement rail when it became obvious that some rail could not be reused.) Universal Constructors were called in to do the dirt work. A broad ditch was dug where the spur had been. This was graded, compacted, tested and then lined with Geogrid before a base course made of ground up concrete grade crossing was laid.

Ballast graciously donated by Rocky Southway of Southway Construction went in and new ties were placed on 20 inch centers for the length of the spur. When the rails and tie plates had been roughly aligned a gang from Gandy Dancers arrived to spike down the track. They worked fast and long with a hydraulic jackhammer and old fashioned spike mauls nearly completing the whole job in a hot dawn-to-dusk working day.

With that done a new survey was performed and a plan was arranged with Klinger to optimize the grade from end to end. The short segment of rail over the work pit was raised three inches to minimize the slope of the track in both directions. Klinger’s iron workers used the air arcing technique to neatly separate welds at the top of the four steel columns that support the rail carrying I-beams across the pit. Three inches worth of jacking up those beams allowed placement of three inch steel caps for the columns and the beams were welded back in.

With that done a crew from Gandy Dancers showed up early one morning to tamp the ballast with “Henry” the 40 year old Jordan chase tamper machine. Heavy jacks were placed in pairs along the track and adjusted by laser to desired height. Then Henry picked along one tie at a time like a giant crustacean with four massive pairs of yellow-black claws poking and shaking ballast under each tie to lock them in place. Some shovel work later and the ballast was properly leveled and edged. Ties to make a grade crossings at the World Headquarters (WHQ) and 8th Street were placed and the double gate at the WHQ was rehung.

Cement for the concrete donated by Grupo Cementos de Chihuahua-USA (GCC) courtesy Rick Percival. A 60 foot rail crossing at the west end of the site and a 20 foot crossing east of the pit were formed up, poured and finished to complete the spur project. Now we can get back to work full time on the 2926.

The happy ending to this story? Simple. ATSF 2926 is NOT going to ground. What does she need next? A roof of course! But that will be another story.

ABOUT THOSE TIES AND THE SMELL OF CREOSOTE

The pungent smell of creosote from the new ties is like perfume to many of the 2926 volunteers. It adds a new sense of reality to the restoration effort. The old ties probably came from the tie plant once located in Albuquerque’s south valley. The new ones came from its still operating twin in Somerville, Texas. (See ‘The Santa Fe Railway In Texas’ article in this issue.)

The old ties had a variety of odors, but none were pleasant. Their creosote smell disappeared years ago. For quality control of the new tie smell, our resident radiologist, Dr. Mike Hartshorne, recommended the new ties receive a cat scan.—Editor
BIG MAIN LINE STEAM

Is There A Resurgence Of Big Main Line Steam Operations In the U.S.?

As the time approaches when our big 4-8-4 locomotive will be brought under steam again, many questions arise. We will have to find answers to them as we move forward. But, first, one generic, recurring question we have is: “What other locomotives of 2926 size or larger are in operating condition?” Just what sort of ‘club’ are we joining? The actual number seems a bit hazy at best.

We know well the San Bernardino Railroad Historical Society, our friends in Los Angeles with 2926’s older sister, AT&S 3751. They have been a great help to us. Everyone knows about Union Pacific’s historic steam program in Cheyenne, soon to have three operating big main line locomotives. The Oregon Rail Heritage Center in Portland and the Tennessee Valley RR each have two big ones. But just how many, and where they are seems to be a moving target. The “How Many?” question was the subject of an editorial by Jim Wrinn of Trains Magazine five years ago. Having a thorough understanding of the importance of big main line steam in American heritage, he asked: “How many mainline steam locomotives are really out there in the United States today?”

His big main line steam definition was: “A locomotive capable of pulling a good sized train -- 10 or more cars -- at track speed (think 40 mph plus) for several hundred miles in a day’s time. That puts us at least into the category of a big eight-coupled locomotive minimum. Secondly, the engines have to be roadworthy and not just "stored serviceable" so that leaves a lot of horses in the barn for this count.”

Using that definition, he came up with only seven at that time and speculated on other possibilities. His research and time elapsed since have indicated that the number is changing. As 2926 comes on line in a year or so, the number can be estimated at somewhere between 8 and 15—and even that estimate will start heated discussions among rail fans around the country.

At the time of the TRAINS editorial (June 4, 2009), AT&S 2926 was still in disassembly mode at its home in Albuquerque. Norfolk & Western Class J #611 was parked at home in the Virginia Museum of Transportation in Roanoke. Union Pacific’s Big Boy 4014 had been on display at Rail Giants Train Museum in Pomon, California since 1961. Within the next couple of years all three will once again be under steam and ready to run. This could indicate that there just might be a renewal of interest in rail heritage. That could mean continued operation of a few big main line steam excursions.

Rail heritage in the U.S., especially main line excursions, doesn’t appear to have the public interest found in many other countries. But nationwide, steam operations from small urban park trains to remote narrow gauge and ‘short run’ standard gauge operations are myriad. Many of the small (short run, narrow gauge, intermittent, etc.) rail operations around the country serve as both local attractions and tourist destinations. Along with the big main line locomotives mentioned above, they are all people magnets.

The big main line steam locomotives on static display in a museum or park will draw a crowd. When under steam they will draw a large crowd, especially when pulling a string of classic passenger cars. Though few in number, remembering those machines and the men who built and operated them is important. It was the big, strong, fast main line locomotives that contributed significantly to the westward growth and industrial development of the U.S. That is a major segment of our national heritage. Though it is doubtful more than a dozen of these big machines will ever be active at any given time, with 2926, 611, and 4014 (and possibly a couple or three others) coming alive, maybe there is a resurgence of interest in Big Steam.

Now back to all the other questions we have: Where can we operate? How do we relate to the busy freight main lines? How do we relate to other big steam operations? Since 2926 is a mobile tourist attraction, how do we relate to such fixed tourist attractions as Las Vegas, NM Harvey House, La Castenada, Santa Fe’s many attractions, Belen’s Harvey House, Spaceport America, and tourist sites in Las Cruces, Deming, and El Paso, TX? Can an operating 2926 provide a link between such locations? How do we market our excursions?

And a big question is: “As a non-profit organization, can we operate and at least break even financially”?

Those questions and myriad others will challenge the NMSRHS in the coming months. —Editor

This map shows locations where Big Main Line steam locomotives will be in or near operating condition in a couple of years. Nationwide, it will be a bit less tilted to the west than it was when Jim Wrinn wrote his editorial five years ago. There are numerous other big steam units listed as ‘under restoration’, ‘stored operational’, etc. at: www.steamlocomotive.com. Some may come alive again, and some currently listed as operational may be shopped for required maintenance.

By 2016, maybe a dozen of these icons of our national rail heritage will be steaming and offering rail fans and tourists an opportunity to see rail travel as it once was.
The New Mexico Steam Locomotive And Railroad Historical Society is facing a major change. For a decade and a half, the Society’s volunteer effort has been a mechanical project. The focus has been hands-on labor, solving technical problems, building mechanical devices and tools, and locating rare parts—all aimed at bringing back to life an icon of New Mexico’s rich rail heritage.

Sure, we have dealt with outside public interest. But that outward looking relationship has been primarily directed to obtaining support for the mechanical work, communication with other rail organizations, and hosting rail fans interested in the project. We have welcomed an increasing number of visitors from throughout the U.S. and other countries to the restoration site. However, that amount of public interface is small compared to the public attention that 2926 will draw once under steam and in operation.

There is a great difference between a mechanical project tucked away out of the mainstream, and a huge steam locomotive pulling highly visible excursions. The latter demands an outreach program commonly associated with tourism.

AT&SF 2926, and the few other large main line locomotives around the country are significant tourist attractions. But unlike most tourist attractions, i.e. museums, national parks, resorts, beaches, sports venues, the big steam locomotives are mobile. The fixed tourist attractions are permanently situated and waiting for visitors. The mobile attractions can meet tourists at different points, and allow them to experience rail travel as it once was. They can also transport tourists to, from, and between the fixed tourism sites.

To transition from a mechanical project to a public oriented program, the Society is increasing its outreach activity. That activity includes membership in the Tourism Association of New Mexico (TANM), liaison with city, county, and state tourist programs and commercial interests catering to tourism. During the past few months, NMSLRHS members have attended and/or participated in events in Belen, Las Vegas, Las Cruces, Ruidoso, and Santa Fe, as well as hosting museum and school groups at the site. (See pictures below). We will continue such liaison, and will provide more details in future newsletters, and on our web site.
ANNUAL MEETING
The Seventeenth, Really?

The New Mexico Steam Locomotive & Railroad Historical held its first annual meeting in 1998—seventeen years ago. Shortly after the second meeting in 1999, we purchased AT&SF 2926 from the city for $1. There would be two more annual meetings before we found a site where we could begin the restoration.

But here we are, within a year or two of having our big locomotive under steam. The Society is strong, still focused on the project at hand, and happily disproving more than a few critics—especially during the early years.

Yep, the “Guys Banging On A 2900” just held our 2014 Annual Meeting as required by New Mexico State Law. It was quite routine. Two Board members, Mike Hartshorne and Don MacCornack were re-elected.

The only change was that John Gibbons was elected to the Board when Ernie Robart chose not to run. After a large part of those seventeen years Ernie decided to vacate the Society’s Treasurer position. Newly elected John Gibbons agreed to take on that duty.

Now, after more than 105,000 volunteer hours, and a total project value of $1.7 million (backed by a clean audit), the volunteers can see the fruits of their labor.

Hopefully before the next Annual Meeting, an icon of New Mexico’s rail heritage will be under steam. Then after testing and shakedown runs, 2926 will be ready to operate as a major New Mexico tourist attraction.

* * *

LOOKING DOWN THE TRACK AND CHANGING PACE

After years of scraping paint, twisting wrenches, machining, welding, and other tasks that go with getting dirty and having fun working on 2926, our pace will soon be changing.

There will still be a lot of grunt work—just to operate 2926. But the Society’s volunteers now must face a very different challenge.

As owners/operators of a major tourist attraction, there will be public relations, marketing, customer service, and a variety local, state and federal involvements—as well as the necessary relations with the rail industry.

Are we ready for the change?
See outreach article page 7.

SUPERHEATER STORY CONTINUES

The last newsletter opened the story of the superheater tubes. It described the location and function tubes. It also made the point that replacement of the superheater tubes means a lot of work. It means lifting, holding, welding, and related heavy exercise in midsummer heat. To alleviate the heat exposure a canopy was set up over the assembly table that was designed for the superheater work. With Carlos the superwelder/pipelifter in charge, several of the volunteers are getting a hands-on course in pipelifting.