AT&SF 2926 Is...
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BIG STEAM NEWS

NEW MEXICO STEAM LOCOMOTIVE
&
RAILROAD HISTORICAL SOCIETY
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SUPERHEATER PIPE FABRICATION COMPLETE

Pipes Are Ready For Hydrostatic Test And Reinstallation.

The last issue of this newsletter drew attention to a turning point in the 2926 restoration—reinsertion of the flue tubes. That step was considered a milestone because there was a significant difference between flue tube installation and other tasks. It started the clock running toward the next boiler rebuild in 15 years, as required by the Federal Railroad Administration (FRA). That newsletter, now posted on the web at ***www.nmslrhs.org*** *contained drawings and pictures descriptive of the superheater pipes installed in the flue tubes to increase steam temperature and boost performance. The following article is about the superheater pipe fabrication, the volunteers who performed the task, and the conditions under which they worked—Editor*

Introduction

For the 2926 volunteers, this task was very different from what it would have been seventy years ago. When the 2900 Class locomotives were operational, a complete Class 5 service (complete overhaul) took thirty days in the AT&SF backshops in Albuquerque. That meant superheater pipe fabrication was done in a couple of weeks or less. The backshops were equipped with all the necessary parts, materials, tools and infrastructure, and staffed 1500 experienced employees working 24/7. The shops differed by several magnitudes from a bare concrete slab with no infrastructure, tools or materials, and only a handful of volunteers working two days per week outside in all kinds of weather.

Also, the 2926 volunteers themselves were starting from scratch. Though individually skilled in many different disciplines, they could hardly be considered steam locomotive boiler specialists. They had to learn, develop a plan, and improvise. Then they had to acquire tools and materials, devise a work station and get busy. It took some time—BUT THEY GOT 'ER DONE!!!

The superheater pipes were pulled out through the smokebox after removal of the smokestack and other components, along with ankle deep soot from the smokebox. (See previous newsletters and photos on web site.) The last bundle was pulled on 12/29/2007. The pipes were stacked, soot was hosed off, and portions that could be reused, pipe headers and the returns on the smokebox end, were cut off. Those reusable parts were stored along with new stock for flue tubes and pipes that arrived in 2009..

Task Preparation

A plan was needed. Secure storage was necessary for the newly fabricated pipe bundles. The work site was no longer a big open slab of concrete. It had become quite crowded. Work space was becoming scarce. Volunteers working only two days per week meant the task would be a long running one, and would be a potential interference with other on-site activity. The task would mean constantly moving a few hundred 20 foot sticks of metal about the crowded work site. That could create problems. It all meant careful planning.

In a rather cramped space between the locomotive and one of two storage units to be used for the finished pipe bundles, a work station was established. A metal work table was built. It was equipped with an arrangement of jigs, clamps, and other accessories necessary for the fabrication process. To provide some creature comfort, a canopy was added. The work station is pictured at right with a completed pipe bundle.

The next planning step was the order in which the bundles would be handled. Each pipe bundle is unique. That uniqueness is defined by header length. That length determined by the distance between the header mounting point on the manifold and the flue tube in which that particular bundle resides.

The task began in the smokebox with the fit and measurement process, identifying first and last bundles in order of reinstallation. To avoid confusion in handling, the fabrication and storage process must reflect that order. The bundles to be installed last would be fabricated first, and stored in the back of the container. Those to be installed first would be made last and stored in the front of the container. In the picture at lower right, John Roberts is shown inside the smokebox taking measurements between the superheater manifold and the front flue sheet.

The Fabrication Process

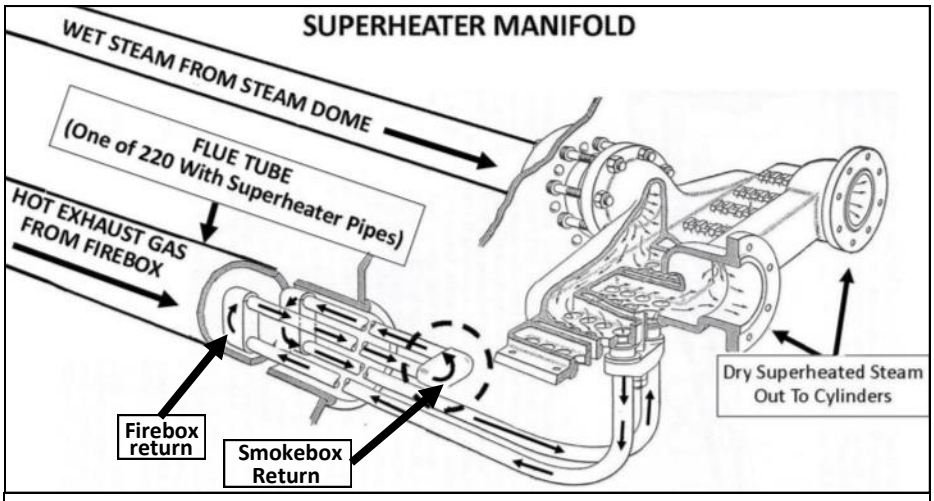
Fabrication was a bit like doing the same jigsaw puzzle over and over. The team became more skilled as they proceeded, but the process was still a tedious one that seemed to have no end. Key pieces, some new and some old, included the straight new sections of pipe, returns for both firebox and smokebox ends of the pipes, and the pipe headers to connect each bundle to the superheater manifold. There were also lots of metal clips used to stabilize and space the pipes inside the flue tubes.

(Continued On Page 2)

(Continued From Page 1)

The new sections of pipe, along with the headers and returns for the smokebox end of the pipes had been stored for quick access. The new pipe sections had been swaged on one end to fit the smokebox returns. (The swaging task and a boiler diagram depicting a typical superheater system was described in Vol XIII, No. 3 of this newsletter, available on the web at www.nmslrhs.org.) New cast steel returns for the firebox ends of the pipes, and new clips were purchased. Those basic ingredients for the superheater pipe recipe are pictured below, along with an early (circa 1920) depiction of the superheater header that was used in a previous newsletter.

The drawing is included for two reasons. 1) It is a good visual description of a superheater system, and, 2) It reflects a difference between what is shown in the drawing and what the superheater team found in the 2926. In removing the old pipes, it was noted that the returns at the firebox and the smokebox ends of each bundle are quite different.



The drawing above shows a cast return on the smokebox end that is identical to the one on the firebox end. The 2926 superheater system does not have the same returns on each end.

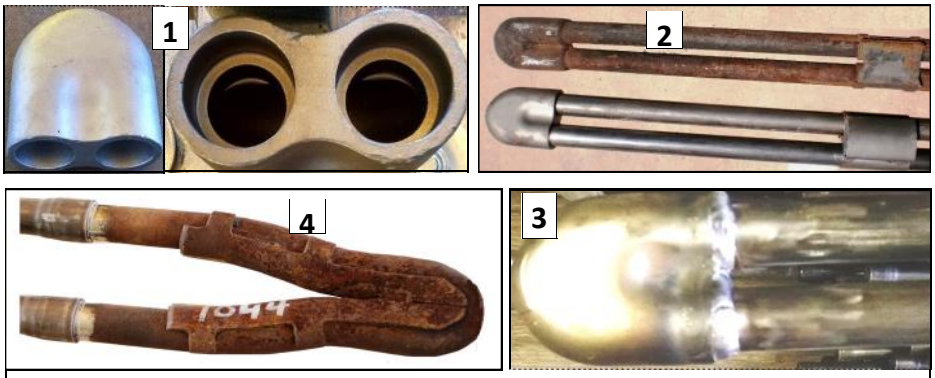
Composition and quality of the returns is important. A combination of high heat and sand thrown in the firebox to clear soot from the flues would quickly destroy unprotected pipes. That is especially true at the firebox end where the heat is much higher.

The drawing depicts both ends as identical cast returns. The 2926 system to be replaced employed a pipe bend creating a hairpin shaped pipe pair. That bend served as the smokebox return. The bend was protected from grit/sand by a saddle type shield inserted inside the bend. When the old pipes were pulled, those returns were cut off and stored for reuse. (See picture below).

Due to extremely high heat, the returns for the firebox end are cast steel, machined to provide a snug fit for a pair of pipes.

To assemble, two pipes are mounted in the jig on the work table. A return is slipped on the pair, tapped down, and then backed off 1/8th of an inch, and securely welded.

Shown in the photos at right are: 1) Two views of a new firebox end return; 2) An ***'old and new'*** picture of a firebox end pipe pair showing a spacer clip and return in place on a new pair ready to be welded; and 3) A finished weld.



The photos depict the difference between firebox and smokebox returns in the 2926 boiler..

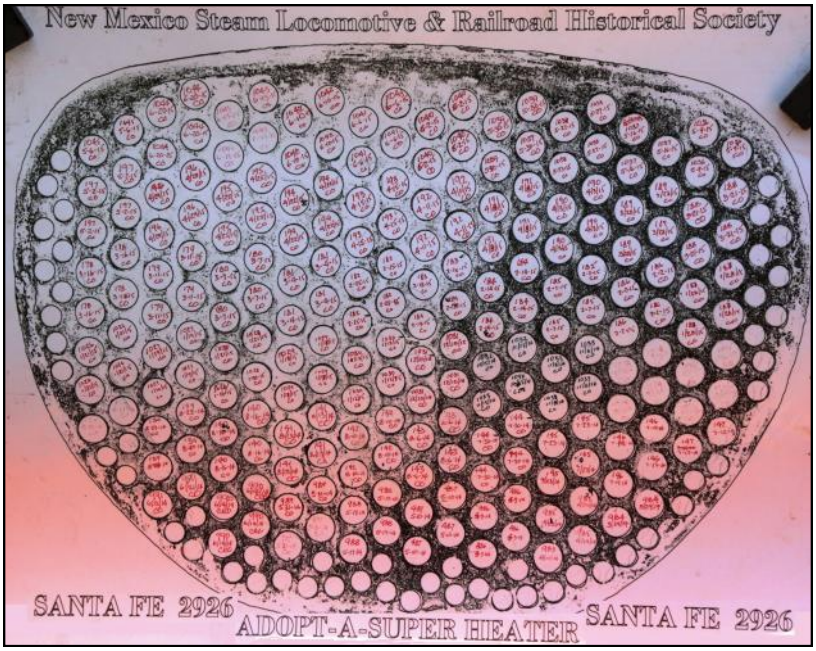
The other image, (4) is a reused smokebox end that has been welded into the swaged ends of new pipes.

Getting It Done

The pictures on pages 4 and 5 show the superheater pipe team involved in various steps of the reassembly. Unlike their predecessors—*24/7 shifts with same experienced people and same routine*—in the AT&SF backshops seventy years ago, it was a very flexible team.

One inflexible member, in both presence at each work session, and in assuring quality of finished work was master welder Carlos Osuna, AKA chief superheater pipester. With pipe welding experience ranging from nuclear power plants to food processing facilities, Carlos led the superheater pipe team from start to finish.

Some tasks, like pulling pipe stock and parts from storage, taking measurements, cleaning pipe ends, setup for welding, etc. were easily done by one, two, or three people. On the other hand, moving a finished superheater bundle to its assigned storage place required five or six people. That job would have been done in the shops by specifically designed lifting equipment. At the 2926 site, Carlos and his assembly crew had to call for help.



The image at right has been a valuable tool in the superheater task. It is a photo of the front flue sheet taken in the smokebox after removal of the flues and pipes. A poster size print was originally used to record 'Adopt-A-Superheater' donations. A copy was made and posted at the superheater work site as a guide for the team to maintain order in handling of the pipe bundles.

FINISHED, DONE, COMPLETE

Those Are Welcome Words Describing A Wide Range Of Restoration Tasks

For years, those words were not a part of the 2926 restoration crew vocabulary. Instead, words like remove, disassemble, repair, and replace seemed to rule. Now the words of completion are heard at virtually every work session. The superheater rebuilding featured here was not the only task completed during the past few months. There were myriad smaller tasks involving staybolts, shims, lube lines, brake components, et al, that required acquisition, fabrication, cleaning, painting, and installation. Below are pictures of tasks at the point where a volunteer could say—**its done!!** More such photos can be seen on the web at **www. nmslrhs.org**.

Finished Tasks

1. Julie completes painting the tiny air reservoirs for the 26L brake system. She had already completed painting of all the renovated lube distribution units.
2. Lube distribution unit ready to be installed: The last step in this task was applying safety wiring to the distribution unit.
3. & 4. Two final steps on the long running flexible staybolt replacement task.

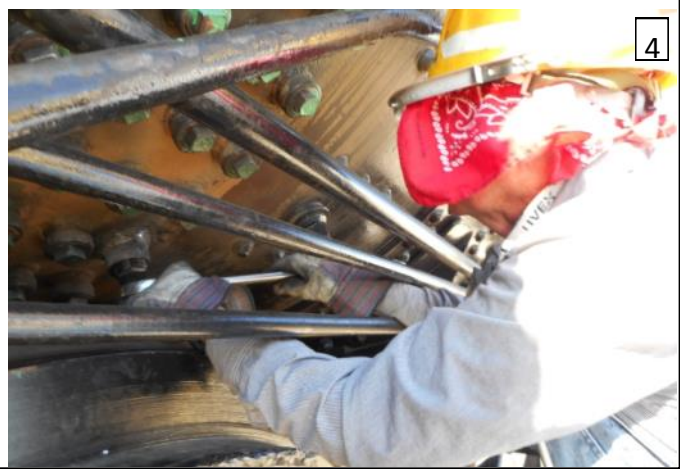
In image 3 Danny uses an inspection mirror to look at the weld on the back side of ***the last flexible staybolt sleeve repair.***

In image 4, reaching into cramped space, Tom torques the last flexible staybolt cap to complete a task that involved everything from fighting rust to parts manufacture.


1


2


3


4

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STEAM LOCOMOTIVE NUMBER 2926

LAST OPEN HOUSE

AT THE RESTORATION SITE

When AT&SF 2926 Steams Up Later This Year It Will No Longer Be A Restoration Site

It Will Become THE 2926 OPERATION STATION

COME DOWN SATURDAY SEPTEMBER 26

Help Celebrate The 21St Century Rebirth Of A Steam Railroad Icon

FREE FOOD

Visit the 2926 store
Shop for 2926 memorabilia.
Hats, Pins, T-Shirts,
Cups, Books, Toys,
Rail Art, and Photos.

BRING THE WHOLE FAMILY

BRING YOUR CAMERA

GET AN UP CLOSE LOOK AT 2926
HEAR THE 2926 WHISTLE
RING THE 2926 BELL
SEE MODEL TRAINS RUN

GOOD MUSIC

The address is:
1833 8th St NW
and
The gates are open from
9:00 AM until 4:00 PM

A BRIEF PICTORIAL LOOK AT THE SUPERHEATER PIPE PROJECT.

The following pictures below and on page 5 reveal just a few of the steps that had to be repeated over and over to rebuild the pipe bundles that will reside inside the 250 flue tubes of the 2926 boiler. It would have been many times easier in a professional shop designed for such purposes, but the determined superheater pipe crew proved that "those guys banging on a 2900 in Albuquerque" could get it done. The entire superheater team and all who assisted them can feel quite satisfied with a job well done.

Above Select, measure twice, cut once, and mark.

1. Pipe sections are selected from stock, measured, cut to length as necessary, and placed in jigs on the work bench.
2. Welder Carlos Osuna watches as Chip Kizer sets up pipes for welding.
3. Team Member Ken Dusenberry measures and marks pipes for attaching the spacer clips.

Above: Rebuilding the smokebox end of a superheater pipe pair.

1. A return to be reused is cleaned and prepped to fit inside the swaged ends of the pipes.
2. Two new pipes are in a jig on the table, and the swaged ends are cleaned and burnished with a steel brush.
3. The return is slipped into the swaged ends and securely welded.

Storage order photos 1, 2, 3:

The varying lengths of the header pipes dictate the order in which they must be reinstalled. Bundles with short headers like those in Photo 1 were finished last and will be reinstalled first. The ones with the longest headers Photo 3 will be installed last.

The bundles will now undergo hydrostatic testing before their reinsertion into the flue tubes.

The boiler will be hydro tested before the superheater pipes are installed.

THE LAST BUNDLE: *In photo 1, Carlos applies a weld to spacer clips that stabilize the pipes inside the flue tube. In Photo 2, he is welding one of the smokebox returns into the swaged end of a pipe.*

1

2

3

4

Finished: *Photos 3, 4, and 5 show three views of that last bundle. In Photo 3, Carlos checks his most recent work.*

Photo 4, The finished bundle is alone on the work table. Since that particular bundle represented the end of a long journey, the crew is probably somewhere outside doing a happy dance. The bundle can be identified as one of the last by its short header connectors

5

Photo No.6: After a call for help, some muscle shows up to carry the bundle from the work area to its storage niche.
Photo No. 7: The last bundle is slid into its place in the storage container.

6

7

MARLIN ALLISON

November 6, 1955—-June 26, 2015

Santa Fe Number 2926 has lost a lifelong fan. The 2926 restoration crew has lost a good friend and valuable member of the crew, and the country has lost another armed forces veteran.

Marlin was born and grew up in the town of Española. He first knew 2926 as a youngster when his mother would bring the kids along on shopping trips to Albuquerque. In those pre-I-25 days, the route into Albuquerque from Española and Santa Fe to the north passed near Coronado Park, home to 2926. Marlin's mom always stopped at the park to allow the kids to play on the huge locomotive.

Marlin grew up, left Española, and enlisted in the U.S. Air Force in late 1974. He met Barbara in 1975. They were married in 1977, and his military career continued until an accident and Muscular Dystrophy brought medical retirement in 1992.

After retirement, Marlin and Barbara returned to Albuquerque and Marlin enrolled at the Albuquerque Technical Vocational Institute where he also put his computer skills to work for the institute. Then, in 2003 he reconnected with his childhood friend—Santa Fe 2926.

He joined the 2926 crew to help bring his old friend back to life.

Marlin And The 2926 Restoration

While working at TVI, Marlin became involved with an amateur radio club. One club member, Travis Atwell, also a member of the NMSLRHS told him about the effort to restore 2926. Marlin remembered well his big friend from childhood visits to Coronado Park in Albuquerque. He showed up at the 2926 site immediately and signed on as a member of the restoration crew, renewing his acquaintance with that old friend. This time the relationship with 2926 wasn't play. It was a labor of love to help bring his old friend back under steam as an important icon of New Mexico's rail heritage.

The timing for both Marlin and the 2926 crew could not have been better. Just short of a year into the restoration project, the work was beginning to generate a lot of information. The project was in need of an IT specialist to manage that information. Putting his computer skills to work, Marlin quickly established an IT system, including both internal files and a web site, that has been one of the key elements of success in the 2926 restoration. Without effective cataloging and management of information, such a complex project dealing with obsolete and forgotten technology is prone to failure.

Marlin Allison, from Española, New Mexico played on 2926 as a young boy. He grew up to be a **real big boy** working on **real big aircraft**. But he came back to help save his old friend—Santa Fe 2926. The IT system he built is still delivering support critically needed for the restoration effort, with Rich Bugge handling the web site. As time goes by upgrades are made, but Rich continues to operate the system Marlin created as his contribution to restoration of an old friend.

Marlin And A Big Aircraft

During his Air Force years, Marlin was involved with numerous aircraft. First trained as a maintenance specialist, he worked on F-4s, F-111s, F-105s, Canadian F-83s, and German F-104s. While stationed in England he even participated in restoration of a couple of WWII survivors, a B-17 and an A-26.

But in 1981, he met and learned to love a big aircraft. It was the U.S. Air Force's huge Lockheed C-5 Galaxy. Marlin served as a flight engineer on various C-5s until his medical retirement in 1992. They took him to all continents, and into places many folks never heard of, as well as some places he could not talk about. Marlin's C-5 involvement leads to the following story of his relationship with one particular C-5 at Kirtland Air Force Base in July 2006. Those of us who were with Barbara and Marlin that day remember well the big guy and his reunion with another old friend—his big ride.

Kirtland Air Force Base July 2006

A number of U.S. aircraft were scheduled for public display at a Kirtland Air Force Base airshow in July 2006. There were F-117 Stealth, VTOL Ospreys, and others, along with a performance by the Air Force Thunderbirds. And yes, there was a giant C-5 Galaxy. Discovering that a C-5 would be among the aircraft displayed, the Kirtland Protocol Officer in charge of the display was contacted. He was told that among our 2926 crew was a former C-5 crew member who would like to attend, but he could walk only short distances, and that wheel chair access would be necessary. The officer went out of his way to accommodate. He came off base to deliver passes for two vehicles and passes for the occupants to the VIP hanger.

Marlin and Barbara arrived at the VIP hanger in his large van. He unloaded his other ride, a big powered wheel chair. We joined him there and entered the hanger. Outside, the temperature was beginning to reach normal early July levels. The C-5 was parked on hot concrete about a hundred yards from the hanger. The heat had driven many of the airshow attendees to the shade of the huge aircraft's wings and fuselage.

It was cool inside the hanger, but Marlin was eager to take a look at the C-5. He had not been near one in 14 years. He rolled out from the hanger toward the C-5 on the ramp. About half way from the hanger to the C-5 Marlin's wheel chair suddenly came to a stop. When asked why he stopped, he said, "That is the same aircraft I trained in at Altus Air Force Base in 1982". He had spotted the C-5s tail number and realized it was another old friend.

(Continued On Page 7)

(Continued From Page 6)

Marlin navigated his wheel chair through the crowd under the C-5's wing to the rear of the aircraft. The rear ramp was deployed for public access. He parked the chair, and using a cane, walked slowly up the ramp to be greeted by the current crew, some of whom were still in grade school when Marlin trained in that aircraft. That crew, and those of us with Marlin received a very special tour of the aircraft. Marlin knew every detail of the heavy lifter. He is pictured below returning from his visit with an old friend.

Accompanied by Travis Atwell, Marlin heads back to the hanger after his visit with the C-5 in which he trained more than two decades earlier.

The day at the airshow ended with Marlin and those accompanying him having lunch in the hanger with another former U.S. military aviator, Tuskegee Airman Bob Lawrence. The conversation between two flyers from a different era with two very different aircraft was captivating. But that's another story. Too bad no one recorded it.

Marlin had many friends, including a couple of very big machines and the folks operating and restoring them. Those who knew and worked with him are certainly better off for having experienced his friendship and eager assistance. Among the 2926 crew, he will be sorely missed. Certainly, his old friend, Santa Fe 2926 is better off for its relationship with the boy from Española.

* * * * *

Lil' Twister Update

A Visit With The Other 1944 "War Baby" Undergoing Restoration

The last issue of this newsletter addressed the parallel restoration of two very different machines representing the middle of the last century when the country was involved in WWII. The two machines are: 1) AT&SF Steam Locomotive 2926; and 2) Douglas A-26 Invader aircraft 44-35643. Both served honorably during the latter years of WWII and the Korean war. Both avoided the scrap yard, 2926 residing on Coronado Park in Albuquerque, and the A-26 serving during the Viet Nam war, and then retiring to private service as a Monarch conversion. Both are coming back to life as icons of their respective areas of service.

On Saturday June 20, while on a trip to Oklahoma, Ernie Robart and I dropped by the hanger at the Guthrie/Edmond OK airport where the A-26, now named Lil' Twister, is under restoration by the Sierra Hotel A-26 Invader Chapter of the Commemorative Air Force. The following photos of Lil' Twister were shot by Ernie.—-*Doyle Caton*

Left: Lil' Twister Propellers Were Just Mounted *Right: Restored instrument panel in the A-26 cockpit.*

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LOOKING DOWN THE TRACK

A Secure Home For 2926

Santa Fe 2926 will return to action later this year. Many 2926 fans would like to see the classic locomotive reside in the iconic AT&SF backshops between the Barelas-South Broadway neighborhoods where it once lived.

At this time, that simply cannot happen. Whatever terms one choses, i.e. renovation, reclamation, redevelopment, restoration, etc. it will be a long time before the backshops will be suitable for 2926 to take up residence there.

Though the vision of someday moving to the shops remains alive, 2926 needs a home with security and protection from the elements ***SOON***, as in a matter of months.

Two or three years ago, the NMSLRHS began looking at options from which 2926 could begin excursion operations when the restoration was complete.

Staying at the current site was one option. Integral to that option were three requirements. Those requirements were: 1) Replacement of the decades old track on the site; 2) A secure protective cover for the fully restored locomotive; and 3) Approval by the owners of the site.

A plan addressing those issues was prepared and submitted to the site owners, the Bureau of Indian Affairs, (BIA) and General Service Administration (GSA). The two organizations have been very supportive over the years. They approved the plan.

The plan consisted of two specific projects. First, the old deteriorated track from 8th St NW to the GSA warehouse would be replaced. Built in 1937, it was definitely not suitable for regular movement of the locomotive.

Second, a secure cover would be built on a portion of the new track. It would serve as an operational home for 2926 for at least a few years. The cover would be so designed that it could be relocated if or when necessary.

Last year, thanks to an anonymous donor, the track was replaced. Now the venerable locomotive needs that shelter. The NMSLRHS Board of Directors chose to initiate a GoFundMe project to raise funds for construction of the much needed shelter.

The crowd funding campaign can be found at **http://www.gofundme.com/SantaFe2926**.

Please go there and help us build a cover for 2926 before the snow flies.

ADDED ACTION AND COMING ATTRACTIONS

From A Secluded Lot On 8th St To Broader Horizons

Since May 2, 2002, when Santa Fe 2926 was gently nudged through the gate by BNSF diesel No. 2628—*with Santa Fe paint scheme, of course*—-the restoration site at 1833 8th St NW has seen a lot of action. In the total rebuild of a locomotive, a lot of work activity is to be expected. But the on- site action went well beyond regular work sessions by dedicated volunteers. There has been a lot of visitor action at the site. The locomotive became a tourist destination without moving, and members of the restoration crew became tour guides.

The visitors came from all points. A couple of years ago, review of an 18 month segment of the 2926 visitor register revealed that 2926 had visitors from all U.S. States and 15 foreign countries. Coming individually and in groups, they would sign in, put on a hard hat and receive a tour of the site. Based on that tourist action, and many hits on the 2926 web site, the action is expected to increase exponentially soon.

After well over a decade on site, 2926 will soon be able to leave the site and reach out to those who would like to see and experience a closer association with the rail heritage icon. Then, any place the locomotive stops, and all points in between, will see a lot of action. Seems everyone loves big steam.

A few years ago, anticipating the additional role as a major *mobile* tourist attraction, members of the NMSLRHS began active association with tourism and hospitality organizations. One such organization is the American Association Of Private Rail Car Owners (AAPRCO). Many AAPRCO members have previously visited the 2926 site, and some are also NMSLRHS members.

In April, a number of AAPRCO members converged on Albuquerque to assemble an excursion train with classic passenger coaches. Pulled by an Amtrak diesel, they headed for Houston and San Antonio. As on previous such occasions, the group was invited to the 2926 site for a barbecue lunch. This time, the list of invited guests was expanded.

New Mexico Secretary of Tourism, Rebecca Latham, other state tourism officials, and members of the New Mexico Hospitality Association were invited. With good food, good weather, and lots of time to visit, the event was a success. Everyone could see the action that lies ahead.

Jen Schroer, CEO of the New Mexico Hospitality Association, and New Mexico Secretary of Tourism Rebecca Latham stand next to 2926 with Bob DeGroft. Both are supportive of the 2926 project, and the big locomotive's role in New Mexico tourism.

The April event might be considered a major step toward a second role for the 2926 volunteers—the role of Big Steam Tourist action. For those who like to wield tools, there will always be lots of action maintaining the big locomotive. But operating 2926 on excursions as a mobile New Mexico tourist attraction will open up new tasks for current NMSLRHS members and future members who would like to join the increased action.

The interest shown by the above organizations is very welcome. Their support, and that of other public and private organizations will be critical in moving from 8th St. to a role as New Mexico's flagship steam locomotive.

Support by many 2926 friends and visitors over the past decades has helped bring the big locomotive back to life. Now, with the additional support, 2926 can steam up and head for broader horizons.