

## Preserving History of the Nuclear Fuel Trains in the Carolinas

*By R Victor Varney, North Carolina Railway Museum (formerly East Carolina Chapter NRHS)*

You may recall two earlier NRHS News articles I submitted about the North Carolina Railway Museum's (NCRM's) effort to rescue ten railroad cars trapped in a nearby nuclear power plant. That effort called "Save the 10" resulted in all ten cars being moved in 4 days from the plant over five miles of public roads to our museum in May 2022. Six of these rail cars had been used to move spent nuclear fuel between three Carolina Power & Light Co (later called Progress Energy, and now Duke Energy) nuclear power plants in North and South Carolina. Two of these rail cars are cabooses that were modified to serve as fuel train "rail escort vehicles" which over the past year have been meticulously restored by our volunteers.

The fuel train consist was usually a single locomotive, a flat car idler, one or two special purpose flat cars carrying the nuclear fuel in special casks, another flat car idler, and then the escort caboose. (See picture.)

The trains (ran) on CSX lines between the three nuclear plants in North and South Carolina. The rail cars on these trains were owned by Carolina Power & Light Co. (later Progress Energy) hence the CPRX name on each. The fuel train fleet consisted of four idler flat cars, three flat cars with fuel casks, and two escort cabooses. Thanks to a generous donation by Duke Energy, the NCRM now has the entire CPRX fuel train fleet except for the three nuclear fuel carrying flat cars. Those three do remain at nearby Harris Nuclear Plant (HNP) and there is a possibility for them to be donated to the NCRM once the casks have been removed and the flat cars are deemed clear of any residual radiation.

The nuclear fuel casks were designed to safely carry spent fuel assemblies with no radiation leakage, and to withstand damage that might occur from a derailment, impact from other rail equipment or a vehicle at a grade crossing. The cask itself can be rotated upwards 90 degrees for loading and unloading the spent fuel assemblies within a secure location inside a nuclear plant. *(Continued on page 3.)*



**FUEL TRAINS IN OPERATION EARLY 2000'S.**  
*(Photo from the NCRM's collection.)*

# NRHS NEWS – AUGUST 2023

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## Upcoming NRHS Conferences & Conventions

### September 1 - 6, 2023, NRHS Annual Convention

<b>CONVENTION INFORMATION</b>	<p><a href="https://nrhs.com/convention/">https://nrhs.com/convention/</a></p> <p>The convention website is now open to make your reservations. Visit the website for access to the convention booklet and the convention registration forms.</p>
<b>HOTEL INFORMATION</b>	<p><b>DoubleTree by Hilton Hotel Deerfield Beach - Boca Raton</b>                  100 Fairway Drive, Deerfield Beach, Florida 33441 +1-954-427-7700</p> <p><i>Hotel reservations may be made by calling the hotel directly (ask for National Railway Historical Society rate code CDTNRS) or booking online.</i></p>

## Upcoming Deadlines

<u>Issue</u>	<u>Submit by</u>
September 2023 issue (online pdf)	August 30, 2023
October issue 2023 (online pdf)	September 22, 2023
December 2023 (mailed issue)	November 10, 2023

# Preserving History of the Nuclear Fuel Trains ...

(Continued from page 1.)



Below is a link to a page with diagrams of a nuclear fuel flat car and how the cask would rotate vertically for load/unload, and then back down for transport.

Click on the diagrams to enlarge to see details.

<http://southern.railfan.net/flat/cars/cprx/cprx10000.html>

**FUEL TRAIN NUCLEAR FUEL CASK CARRYING FLAT CARS, EARLY 2000's.**  
(Photo from NCRM's collection)



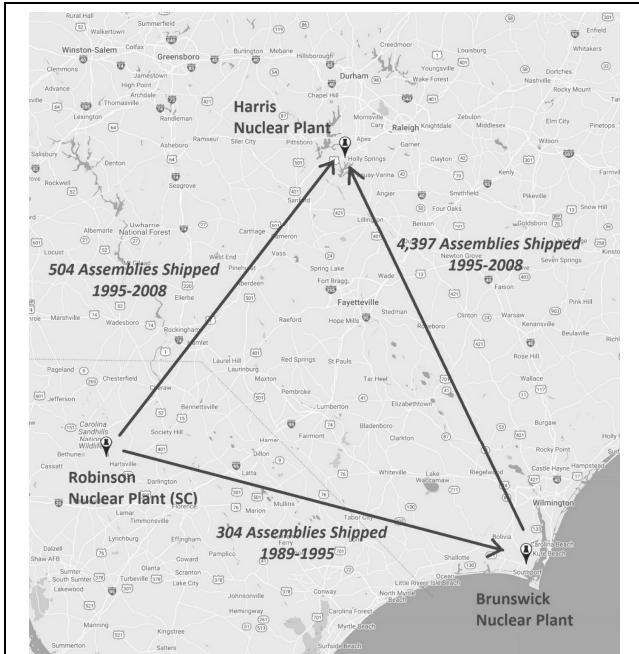
**CPRX 1000 NUCLEAR FUEL CASK FLAT CAR IN THE 1990'S.** (Photo courtesy NC State Highway Patrol)



**FUEL TRAIN WITH ESCORT CABOOSE CPRX 10009 - Leaving CSX line and proceeding down siding about two miles to the Harris Nuclear Power Plant in the early 2000's.** (Photo from NCRM's collection.)

The spent nuclear fuel trains ran between 1989 and 2008. Their purpose was to move spent nuclear fuel rod assemblies stored in cooling pools at one plant to another plant with more cooling pool capacity for "interim storage." These trains started running before onsite dry fuel storage was a viable option and then continued as a safe, and more cost-efficient alternative to onsite dry storage. The initial operations between 1989 and 1995 focused on moving 304 spent nuclear fuel assemblies from the Robinson Nuclear Plant (RNP) in South Carolina to the Brunswick Nuclear Plant (BNP) in North Carolina. Starting in 1995 and until 2008, the spent nuclear fuel was all shipped from RNP (504 assemblies) and BNP (4,397 assemblies) to the Harris Nuclear Plant (HNP) located twenty miles southwest of Raleigh, NC. HNP was the newest of the three plants and built with far more spent fuel storage capacity. (See map on next page.) The trains were discontinued in 2008 to preserve storage space for future needs at HNP.

THE STORY OF TWO CPRX FUEL TRAIN ESCORT CABOSES



MAP WITH NCRM ANNOTATIONS. (Source of Map: Duke Energy website.)

THE TWO CPRX FUEL TRAIN ESCORT CABOSES - They were first found in Nov 2019 at Harris Nuclear Plant. (Photo by R. Victor Varney.)

The two CPRX fuel train escort cabooses numbered 10002 and 10009 were acquired by Carolina Power & Light Company as surplus after no longer being used by US railroads. They were then modified to serve as escort cabooses.

CPRX 10002 was built in 1968 by International Car Co. in Kenton, Ohio for the Chesapeake & Ohio Railway. It was numbered 3124 in a series numbered between 3100-3325. It was painted in C&O blue with yellow lettering and assigned to operations out of Grand Rapids, MI. In 1979 it was repainted in Chessie System yellow with blue lettering and the "Chess-C" logo. In 1982 it was renumbered by CSX as 903124.



C&O 3124 (Photo courtesy C&O Historical Society)

C&O 3124 (Photo courtesy C&O Historical Society)

In 1989 the caboose was acquired by Carolina Light & Power Co. and repainted in red with white lettering as CPRX 10002. Initial upgrades included installing new back up batteries, a battery charger, and a solar charger while retaining the original railroad Spicer #2 wheel-driven generator. In early 1989, 12V DC to 120V AC converters, charging circuits for portable radios and portable radiation monitoring equipment, two UHF radios installed for communication to the CP&L Energy Control Center (ECC), one VHF radio for communication with the NC State Highway Patrol, and a CB radio to communicate with local law enforcement agencies were all installed.

On May 12 1989 CPRX 10002 was dispatched to the Brunswick Nuclear Plant (BNP) to begin escorting spent fuel trains from Robinson Nuclear Plant (RNP) in South Carolina to BNP. In 1998 it was upgraded with a new diesel generator (wheel-driven generator removed), new wiring and an RV style AC unit. In 1999 and 2001 additional wiring and circuit breaker upgrades were completed. A microwave, chilled water dispenser, and refrigerator were also installed.



***CPRX 10002 INTERIOR - As originally found Nov 2019, and curating contents after moving May 2022. (Photos by R. Victor Varney.)***

We believe the very last fuel train run for CPRX 10002 was in 2007, It was subsequently moved to HNP around 2016 where it was to be scrapped. Remarkably, when the NCRM first visited it at HNP in late 2019, much of the contents left by the last fuel train crew were still inside. Nothing had been disturbed after the last crew left and locked it up. These included Fig Newtons left behind in the refrigerator (which still looked edible given what must be amazing preservatives).



CPRX 10009 was built in 1966 by International Car Co. in Kenton, Ohio for the Denver & Rio Grande Western Railway. It was numbered 01510 in a series numbered between 01500-01514. It was rebuilt and repainted by the DRGW in 1973. We believe it was acquired from the DRGW by an individual after 1996; then, subsequently acquired by a rail car broker. In late 2001, it was acquired by the Carolina Power & Light Co. In a photo on the next page, it is about to leave Pueblo, CO in January 2002 for North Carolina.



**UPGRADES AND HISTORICAL TREATS, ALL INTACT – CPRX10002 came ‘well-stocked’. (Photos by R. Victor Varney.)**

In April 2002 it was inspected and serviced by CSX for CP&L. It was painted and renumbered CPRX 10009. Upgrades by CP&L contractors included a new diesel generator, electrical system, backup battery system, two RV style HVAC units, Microphor railroad toilet, four air suspension seats, and radios for CP&L and NC SHP. Other modifications included removal of the original railroad stove and smokestack. A long storage area with a padded bench on top, desks with storage, and a large metal cabinet was installed for more storage space. Other installed items were a refrigerator, chilled water dispenser, and microwave.

We believe the very last fuel train run for CPRX 10009 was in 2008. Like CPRX 10002, when CPRX 10009 was first visited by the NCRM much of the content left behind by the last crew was still onboard. Only the radio equipment, refrigerator, microwave, and water dispenser had been removed. for photos of CPRX 10009 when it was still on the DRGW, see the links below.

<http://www.rrpicturearchives.net/rsPicture.aspx?id=277802>

<http://rrpicturearchives.net/showPicture.aspx?id=3036378>



***NUCLEAR FUEL TRAIN ESCORT CABOOSES - CPRX 10002 & 10009 after restoration, May 2023. (Photo by R. Victor Varney)***

Nuclear fuel and weapons trains still use escort vehicle cabooses today. The designs are far more sophisticated than CPRX 10002 and 10009. See an example of a modern escort caboose at the link below.  
<https://www.energy.gov/ne/articles/rail-escort-vehicle-fact-sheet>

### **THE CREWS OF SPENT FUEL TRAINS**

The crews on the spent nuclear fuel trains were a combination of utility, security, and railroad personnel. Typically, there were 3-4 Carolina Power & Light Co (later Progress Energy) staff onboard to monitor the spent nuclear fuel during transport. They also maintained constant contact by radio with the utility's Energy Control Center in Raleigh, NC to provide status and location information as the train traveled. The security team members were North Carolina State Highway Patrol troopers and officers specially trained to escort hazardous materials transported by rail or truck.

When the trains operated in South Carolina an equivalent team was provided by the South Carolina Highway Patrol. They traded duties when the trains crossed the state line. There were usually three troopers or officers with weapons to guard the fuel trains. One would always ride in the locomotive cab with the engineer, and two would ride in the escort caboose. The gun mounts in the cabooses were used to hold the rifles the Highway Patrol carried with them. In addition, the Highway Patrol would have several others in marked and unmarked vehicles and often a helicopter to protect the trains. The Highway Patrol radio system on the escort caboose was used to maintain contact with local Patrol offices, others escorting the trains, and local law enforcement agencies.

Responsibility for running the train was handled by the CSX train crews in the cab and onboard the escort caboose. Keep in mind that by the time the fuel trains were running in the Carolinas, the CSX like most other railroads no longer ran cabooses on their trains. In pictures of these trains, you'll see the by then standard rear end device at the rear of the train on the escort cabooses.

After 9-11 in 2001, Progress Energy (formerly CP&L) wanted to upgrade the rifles carried by the NC State Highway Patrol security detail on the fuel trains to AR-15s. At the time the North Carolina State Highway Patrol did not have these rifles in their inventory or the budget to purchase them.



**FUEL TRAIN SECURITY TEAM MEMBER IN THE 1990'S** (Photo courtesy of the NC SHP.)

The utility offered to donate three AR-15s to the NC SHP. It had to go all the way up to the North Carolina Attorney General's office to get approval for the Highway Patrol to accept the rifle donation. Whenever the fuel trains ran after that, there were always three AR-15s onboard (plus other Patrol weapons).

In July 2022, several of our members had the opportunity to meet with Col. Freddy Johnson, Jr who runs the NC State Highway Patrol and earlier in his career had worked on the nuclear fuel trains. He shared many of his recollections about the trains.

It could be a tough duty. The trains starting at BNP headed to HNP required the crews to arrive at 3 am. The trains could sometimes take 18 to 20 hours or more to arrive at HNP (vs about three hours by car). We were surprised to hear that the fuel trains did not have any "priority" status and could often be held up due to other CSX train operations.

We asked him about the rifles that were used by the NC SHP on the fuel trains as we were interested in getting a couple blue plastic practice rifles to put on display. Col. Johnson offered to provide a couple surplus AR-15s to display. "Oh no!" we explained -- we can't display real rifles. So instead, he offered to donate some practice rifles (which we did get later).

During our discussions with Col. Johnson, we also learned that by the time we met him there were only two other people still with the NC SHP that had worked on the fuel trains. All the rest had either left the Patrol, retired, or passed away. With our interest in preserving history, we floated the idea of organizing an event to recognize NC SHP, Duke Energy, and CSX fuel train veterans once we restored the cabooses and help us inaugurate the escort cabooses into service on the NCRM's historic New Hope Valley Railway. He enthusiastically supported the idea.

The **Fuel Train Event** happened on May 20, 2023. The cabooses looked beautiful. Our guests included eleven fuel train veterans, their families and friends, and several North Carolina State government dignitaries with their families. Overall, about fifty people attended the event.

Speakers at the event recognized and thanked the veterans. The speakers included Tom Haaf, the plant VP for Duke Energy's Harris Nuclear Plant, Col. Freddy Johnson, Jr. of the NC SHP, Ben Moss from CSX and a NC State House Rep, and Dan Gurley, Deputy Chief of Staff for the NC Speaker of the House.





**MAY 20, 2023 WAS A BRIGHT DAY FOR OUR GUESTS AND THE ELEVEN FUEL TRAIN VETERANS - Caboose looked beautiful for our guests which included the veterans, their families, friends, and several North Carolina State government dignitaries with their families. (Photo by R. Victor Varney)**

After the recognition presentation, the veterans were able to board the two escort cabooses set up in a train with two of the actual idler flat cars as our “simulated nuclear fuel train.” A second train also departed with family members, guests, and others to meet at the north end of our line for a run by of the two trains. Lots of smiles, waves, and photos taken. Plus, some great drone footage.



**ELEVEN FUEL TRAIN VETERANS ONBOARD CPRX 10002 AND 10009 – May 20, 2023, Inaugural run on the NCRM’S New Hope Valley Railway. (Photo by R. Victor Varney)**

Now that the fuel train escort cabooses have been inaugurated into service on our New Hope Valley Railway, they will become available for our visitors to see and ride. The cabooses also have displays inside to tell the story about the fuel trains in the Carolinas and the crews that worked on them. That includes the many items left behind by their last crews along with the blue plastic AR-15s. With the generator and AC working on CPRX 10002 it will be the first to go into service this summer, CPRX 10009 will follow in the fall but requires a new generator (est. cost \$15,000) which is going to take some fundraising.

NRHS members interested in supporting us can donate on our website, our Facebook page, or send a check by USPS. Designate your donation for the ESCORT CABOOSSES.

More details about the fuel trains, the Fuel Train Veteran event, info about how to see and ride on the escort cabooses plus more photos and drone footage can be found on our website [www.triangletrain.com](http://www.triangletrain.com)

## President's Column – Good Things Are Happening!

By TONY WHITE, President, NRHS

I am pleased to write this report because there are good things happening within the NRHS. First, I would like to thank everyone for renewing their memberships and to say, "welcome to the new members."

The 2023 RailCamp has been completed and it was highly successful on both coasts. We have forty new members joining us. Many thanks to the staff on both coasts for giving up a week of their time to give these campers a firsthand knowledge of railroading. There will be an extensive report with pictures in our next online issue of the News.

The convention is coming up quickly. There remains some opportunities to take part in the activities.

Conventions are learning opportunities, fun to hang with members whom you have not seen in a while and to see and explore new places. This year's convention has rare miles and high speed!

We will have the mandatory meetings. Everyone is welcome to attend these meetings. Next, the trips start.

Yours truly will be at the convention hotel from Thursday evening August 31 through September 7. Stop and chat with me. I cherish the chance to meet each one of you and for those I already know, it will give us a chance to catch up.

Many of you are collectors and you shop for special unique items. We are hoping to have a joint conference in 2024 with a premiere group where each of you collectors can have a shopping frenzy. We will also have a trip planned. Stay tuned for Bob Bitzer's article on this conference for next year.

We are still looking for volunteers in many of the areas throughout each year within the NRHS. Please share with our current volunteers your appreciation for all they are doing.

Finally, we are already having communications for next year's convention out of Harrisburg, PA.

Everyone loves that area and we intend to take advantage of every neat railroad and museum near Harrisburg. The Harrisburg Chapter will be actively involved in the planning. So, stay tuned!

## About the NRHS News

The *NRHS News* is published nine times a year by the National Railway Historical Society. A full-color issue is published each even-numbered month and is available as a pdf file on the NRHS web site. The three remaining issues are printed black-and-white and mailed to members in March, July and either September or November.

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