



LITTLE RAILROAD, BIG CHALLENGE

How a Class 1 yard maintained by a short line got out of the gumbo

By David C. Lester, Managing Editor

In 1996, the Southern Pacific Railroad built a storage-in-transit (SIT) yard in Dayton, Texas, named Robinson Yard. When the proud, long-standing road that Edward Harriman declared “an empire” when he purchased it in 1901 was finally acquired by Union Pacific (UP) in 1996 (fulfilling Harriman’s dream of bringing the roads together), Robinson Yard became a UP yard. Robinson became a staging area for chemical plants served by UP in the Houston area. In 2008, when the short line industry had become a significant player in the U.S. rail network, providing both line-haul and switching service to customers, UP granted Anacostia Rail Holdings’ (ARH) Gulf Coast Switching (GCS) the opportunity to operate and maintain Robinson.

This yard is significant from the standpoint of its size and the traffic it handles. Robinson has a capacity of approximately 2,700 plastic pellet hopper cars, about 39 miles of track, and comprises two main switching leads, two long running tracks, 74 yard tracks, and 99 turnouts.

“Gulf Coast Switching currently operates with three two-person RCL crews; it is a seven-day-a-week operation, and we have a three-person track crew that maintains the yard. Union Pacific operates Tracks 1-20, and Gulf Coast Switching operates on Tracks 21-74, and Gulf Coast Switching is responsible for maintaining all 74 tracks,” Leigh Walters, president of GCS, told RT&S. In addition, Walters added that GCS utilizes 2-SD-40 locomotives equipped with Cattron remote-control technology that

allows for a safer, more efficient operation.

“Being under the umbrella of Anacostia Rail Holdings enables us to pull knowledge and resources from our safety and engineering group along with five other short line railroads, too,” Walters said. ARH, headquartered in Chicago, comprises the Chicago South Shore & South Bend Railroad (freight only), the Louisville & Indiana Railroad, the Pacific Harbor Line, New York & Atlantic Railway, Northern Lines Railway, in addition to GCS.

When Southern Pacific built Robinson Yard in 1996, the construction standards used were not those of the UP Railroad today. “After a few years of operation, it became apparent that routine maintenance was insufficient to hold track surface. Mud and gumbo rose to the surface after every

subgrade had resulted in overstressing of the subgrade.

The conclusion was that the mud resulted from ballast degradation and global pumping of the underlying mud up through fissures in the lime-treated layer and the sub-ballast.

In 2010, GCS undertook a significant project to undercut and stabilize the No. 91 lead, which is the main switching lead for the storage portion of the yard. It is heavily used by GCS to make up trains for the UP. Coordination with operations was critical as GCS's obligation to provide a train to UP each day did not change. Crews undercut nine turnouts and inside switch panels (and the track in between) using track hoe-mounted undercutter bars. All material was handled by truck since the operation could not accommodate work trains.

Then, crews installed a GEA-designed drainage system utilizing geotextile fabric and graded longitudinal drains, and applied sufficient new ballast. This work corrected an unstable trackbed that would fall out of compliance after every heavy rainstorm. With routine cross tie and surfacing maintenance, this solution has proven effective over the last decade.

"Over the next few years, additional turnouts were undercut using a track-mounted switch undercutter. These efforts were difficult to coordinate with the operation and resulted in significant machine downtime waiting on trains. By 2019 it was apparent that the north ends of Tracks 1 through 6 were sinking into the muck. These 5,000-ft tracks are heavily used daily by the UP to arrive and depart trains. Track surface would fall out of compliance after every rainfall, and the constant maintenance effort was affecting the operation. The undercutting, surfacing, and ballast replacement deficit was manifesting with unplanned maintenance interruptions and emergency remedial actions," said Walters. Crews could not adequately inspect some segments due to the mud in the track hiding tie and fastener conditions. As with the switching leads, a lack of ballast under the ties and a poor drainage plan resulted in track that was very difficult to maintain.

Furthermore, due to operational restrictions and low contractor availability due to Hurricane Harvey, the bulk of the 2017 planned work pushed into 2018, and 2018 pushed into 2019.

The deterioration of the heavily used UP Tracks 1 through 6 caused by lack of attention to the causes of fouled ballast,

inadequate renewal rate of the turnouts, joint accumulation, and significant cycle tie deterioration are of most concern looking forward. On the long tracks (1-6), recently surfaced segments continued to need repetitive surfacing to stay compliant, disrupting the operation, and are not cost-effective.

According to Paul Fetterman, in 2019 the plan to attack these deficits was twofold. First, an intensive maintenance effort got underway:

- Repaired 30 frogs;
- Upgraded 13 point protector plates;
- Installed seven complete point protectors;
- Installed a lubricator ahead of the main switching lead;
- Installed large double-shouldered plates ahead of each switch point; they received five spikes per plate to resist gage widening ahead of the points;
- Purchased a stock rail grinder to remove metal flow from all special trackwork throughout the yard; and
- Installed two new frogs, 11 guard rails, and 12 switch point/stock rail sets.

Second, a major contracted effort to correct the deficiencies in Tracks 1 through 6 began. GCS engaged Foster Jones Associates (FJA), a rail engineering consulting firm, to design and manage the renewal of these tracks. First on the priority was an under-track drainage system that would remove water from the roadbed quickly after rainfall. FJA built on the initial concept with longitudinal underdrains feeding lateral drains, which directed water to ditches at the exterior of the yard. These perimeter ditches also were cleaned and regraded to improve flow conditions. Another critical aspect of the design was ensuring the designed profile of the rehabilitated tracks resulted in minimal disturbance of the underlying hardpan while remaining in compliance with UP gradient standards.

The scope of this project was such that working under traffic was not practical. GCS acquired all the ballast and tie and stockpiled them clear of the worksite. Material was to be moved by off-road trucks and loaders approximately ¼ mile to and from the jobsite. Project details included:

- Removal of 16,000 ft of CWR track and all fouled ballast down to the subgrade elevation;
- Install 9,000 ft of drainage pipe and 73 rolls of geotextile fabric;
- Pre-ballast the track and grade to 2 in. below final surface using GPS-guided equipment, reinstall the 16,000 ft of track,

Gulf Coast Switching begins the process of restoring Tracks 1-6 in Robinson Yard.

rain, and the frequent tamping corrections were beginning to interfere with operation," Paul Fetterman, president of Triple Crown Track, who has served as an engineering consultant for ARH for the last 11 years, told RT&S. To ensure an effective solution, GCS engaged David Coleman of GEA Associates to diagnose the cause of the track instability.

Sample pits were dug, and soil samples were analyzed. A thin ballast layer along the switching lead was underlain by an 8- to 9-in.-thick sub-ballast layer. There are indications that the silty clay subgrade soils may have been lime-treated. It appeared that the relatively thin ballast and sub-ballast sections, combined with heavy rail traffic, deteriorated drainage conditions over time, and the moisture-sensitive silty clay/clay



Workers installed 9,000 ft of drainage pipe for an under-track drainage system to remove the water quickly after rainfall.

and change 3,100 defective ties; • Dump remaining ballast (25,000 tons total) and surface track to final grade; and • Destress the CWR and eliminate 291 joints by electric-flash butt welding.

UP was consulted early on and agreed to a 60-day relocation of their operation

so the project could proceed with 24-hour track occupancy.

After receiving bids from various track contractors, GCS awarded the project to Choctaw Construction Services (CCS). CCS hit the ground running with the equipment and workforce necessary and worked long hours (typically 12+ hours

per day) to restore Tracks 1-6 and return them to active service in just 51 days. Due to limited working room and the intense volume of construction traffic, conventional construction staking was not possible. CCS machine operators and FJA field management personnel worked together closely to keep alignments and grades on target and execute design changes when field conditions warranted it.

The crew used conventional GPS rovers and GPS-guided construction equipment loaded with the designed surface model. FJA adjusted final track profiles on the fly to keep the subgrade above the existing hardpan and redesigned portions of underdrain systems in the field to avoid utility conflicts.

One key to getting ahead on the schedule early in the project was CCS's use of specially designed and fabricated spreader bars attached to large excavators, allowing them to lift and remove the existing track quickly.

This method allowed the tracks to be removed and reinstalled without cutting

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Track Safety Standards, contains all the Track Safety Standards, Subparts A-F, for Classes of track 1-5. The standards cover general information, Roadbed, Track Geometry, Track Structure, Track Appliances and Track-Related Devices, and Inspection. Includes Defect Codes. Updated January 11, 2021.

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them into panels, and a minimal amount of stress applied to the track structure.

Additional thoughts and comments related to the project:

- The aggressive schedule and limited working room made this a very unique and challenging project;
- It was a very cooperative team effort by the personnel of Gulf Coast Switching, UP, FJA, and CCS;
- CCS had an excellent approach to the project and executed its plan well. They supplied the project with the necessary well-maintained equipment. There was minimal downtime due to equipment failures. RTS did a great job with their tamper and regulator;
- CCS did an excellent job in looking ahead on the project. They would work the hours necessary to set their plate for the next day's work to be as productive as possible;
- Having knowledgeable engineering personnel managing the project on a day-to-day basis was essential. We were able to adjust the design on the fly to accommodate the construction methods and



Workers installed 73 rolls of geotextile fabric to help shore up Tracks 1-6.

sequencing and to mitigate unforeseen field conditions without sacrificing the quality of the end product and without delaying the project's progress.

The project required only 51 days.

Today, the yard is approaching a normalized maintenance schedule.

The last two years the work has consisted of track raising and tie changeout along with routine surfacing and turnout maintenance.

The challenge from now on will be to address tie conditions as most of the once-new ties from 1996 deteriorate around the same time. **RTS**

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