LAST STAND FOR SOUTHERN PACIFIC SEARCHLIGHTS

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PHOTOS BY THE AUTHOR

ABOVE: Three newly rebuilt UP SD-59s lead the Redding Turn south past the searchlights north of Red Bluff, Calif., on April 1, 2015.

RIGHT: At dusk, UP's hot Lathrop, Calif.–Global 2 (Chicago) Z train has a high green at the west switch at Pequop, Nev., on June 13, 2014.

Since the Union Pacific takeover of Southern Pacific in 1996 there has been a steady removal of classic searchlight signals, cantilevers, and signal bridges throughout the system. At first, it was at a slow pace, then, with the advent of Positive Train Control, the removal picked up a great deal of urgency. Today, few examples remain along the former Espee lines operated by UP, and time is running out.

SP first began using the Automatic Block Signal (ABS) system in 1901 on the original Coast alignment from San Francisco to San Bruno over Oceanview Summit, utilizing semaphore signals that give indication based on the position of the arm. Shortly after Union Switch & Signal's introduction of the Style "B" semaphore in 1898, SP made exclusive use of this hardware across the entire railroad.

By 1907, the entire Coast Line was signaled from San Francisco to Los Angeles. Being a part of the Harriman Lines and influenced by UP control, SP was a real believer in safety early on and ABS signals were a huge leap forward in safety applications. Two of the last larger semaphore installations in service on SP were the Phoenix Line and the Tucumcari Line. The final SP semaphores lasted until 2007 on the Siskiyou Line operated by Genesee & Wyoming's Central Oregon & Pacific.

A Modern Advancement

The Hall Signal Company was behind the development of the searchlight signal, a vast improvement over its original "disc" signal. Hall developed a sophisticated system that included an efficient elliptical reflector mirror which focused the light on roundels. There was also a state-of-the-art lens system that further focused the light beam. That and the low-voltage lamp behind an almost miniature vane with three roundels projecting light through to the lens system were the real keys to the searchlight signal. There was a specially built bulb with a filament that concentrated light in a very specific area focusing on the roundels.

The small vane was constructed so that upon failure of the signal mechanism, it would always revert back to the most restrictive signal display. When no voltage was applied, the vane would fall back to the restrictive position due to gravity. There were separate relays that moved the signal head and lit the lamp. If just the lamp was lit, it would show the most restrictive indication — usually red — then by sending voltage to the relay that controls the vane, it would move to green. To get the yellow aspect the current was reversed.

In 1925, US&S purchased Hall Signal Company with the express purpose of obtaining the patent rights to the searchlight signal. This first searchlight had what was called an "H" signal mechanism. In later years, further improvements developed the "H-2" mechanism. This became the most commonly used railroad signal in the western U.S. General Railway Signal produced a similar searchlight signal system but it was never used on SP. The "H-5" was the final searchlight model produced by US&S; this was a larger and more effective signal but was not widely used on western roads with the exception of Santa Fe.

Southern Pacific Standard

In 1928, US&S introduced the modern searchlight signal that was much simpler to maintain than a semaphore. These signals could also be seen from much farther away, especially at night, a real safety advantage over the semaphore. Searchlight signals are said to be visible for more than a mile during daylight hours and much farther at night (hence their nickname).

Southern Pacific took notice and, according to my best research, the railroad

made its first searchlight installation on the West Valley Line between Davis and Woodland, Calif., for a short distance of nine miles; this was previously unsignaled "dark" territory. These signals immediately proved to be highly successful and later that year, the remaining 101 miles north to Tehama were under construction. At this same time, a second searchlight installation began on 105 miles of the East Valley Line between Roseville and Tehama. Both of these searchlight installations were completed by 1930.

With the success of these two installations, the searchlight signal became the standard hardware for all new signal installations. In later years, SP began to replace older semaphores with new searchlights. This did not happen immediately, and most of the semaphores lasted well into the diesel era.

In the late 1930s, railroads began to incorporate more and more signals on their main lines as safety became a major issue because trains were becoming heavier and longer and more frequent. The Interstate Commerce Commission issued new rules stating that signals must be above or to the right of the track they were controlling. This was so they could be easily seen by engineers on steam locomotives who had restricted vision since they could only see on their side of the engine.

Southern Pacific installed both signal bridges and cantilevers on most of its western lines. Signal bridges were often used in industrial areas where there were drill tracks on either side of a single- or double-track main line, because there was no room to put standing signals between the main and drill tracks. Signal bridges were also used where there was limited visibility or heavy snow in mountainous areas.

Cantilevers were usually installed at one end of a siding. If there was no room to incorporate a wide-out (where the siding swings out away from the main to allow placement of a standing signal), then a cantilever would be used to put the main line signal above the track. If room allowed, the wide-out was utilized. SP often would use dwarf signals in these installations. Cantilevers were common on SP's western lines.

OPPOSITE: An aging Caltrain F40 negotiates the maze of trackage leaving the San Francisco depot under the cantilever signal on November 29, 2017. Note the many dwarf searchlight signals still in use today.

RIGHT: A typical intermediate SP signal installation is located east of Holborn, Nev. Note the wires leading from the code line to the signal. Almost all code line has been eliminated on former SP lines.

Fading Legacy

Today, very few searchlights are still in service on former Southern Pacific lines. The searchlights on either side of the snowsheds at Norden, including the signal bridge on the west end, were replaced by modern signals on November 23, 2021. The wye at Davis, Calif., is still protected by searchlights. The Coast Line has a number of installations in the Salinas-Watsonville Junction area and on Cuesta Grade above San Luis Obispo. The largest group of remaining searchlights is on the Phoenix Line between Picacho Junction on the Sunset main line and Phoenix. There is a small group in the Los Angeles basin in Norwalk and Huntington Park. In San Francisco, at the Caltrain station, there are quite a number of dwarf signals and then a cantilever with searchlights. Finally, Lathrop south of Stockton has a few, as well as the line from there to Tracy. There are only a handful of original signal bridges still in use on former SP lines. The last two classic-style SP cantilevers standing are on Cuesta Grade above San Luis Obispo at Serrano siding and the Caltrain station in San Francisco.

With today's new technology including PTC, we may no longer see wayside signaling systems in the near future; there may be signal indications only on the computer screens in the locomotive cabs. Those lineside signals that we have dearly loved may become part of railroad history, as have so many other things in the railroad industry.

DAVIS TREASURES

Davis, Calif., is located at the junction of the former Southern Pacific West Valley Line now operated by California Northern Railroad (a Genesee & Wyoming operation) and the Union Pacific Martinez Subdivision running from Roseville to Oakland. UP has searchlight signals on their main line east and west of the depot including a signal bridge for the east crossovers. The wye and crossovers make this a rather complicated CTC interlocking. The real gem in Davis is the searchlight north of the wye; this signal was part of a group of the very first searchlights installed by SP in 1928, and is still in service today.

ABOVE: California Northern GP-38 1568 splits the searchlights at Davis, Calif., on the evening of January 12, 2018, working the Davis Job out of Woodland. This set of searchlights was part of the1928 first SP installation.

RIGHT: A classic SP-style triple searchlight signal sees the passing of the California Northern Davis Job as the train heads onto UP's Martinez Sub at Davis on March 2, 2015. Note the lower lunar signal is lit, giving the crew permission to enter the UP line.

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LEFT: An eastbound Capitol Corridor passenger train is approaching the crossovers west of the station. Another train is lined up westbound and has a green signal to leave the depot on February 3, 2015.

BELOW: Just before midnight on February 18, 2015, the northbound *Coast Starlight* departs Davis on a foggy night. Fog can provide the moisture for long beams of focused light cast by searchlight signals.