:HECK SWITCH HEATERS NOW

\T&SF Tests Infrared Heaters

\ n entirely new approach to the \ problem of keeping switches free snow is being tested on the Santa Fe. involves the use of gas-fired infrared aters mounted overhead with the ,s being directed downward and ncentrated in the area of the switch.

The initial installation was made in :tober 1960 at a crossover switch in : westbound main track at Amarillo, x. Since that time the road has been nning a series of tests for the purse of developing an efficient basic sign, according to R. H. Beeder, sysn chief engineer of the Santa Fe.

The principle of the use of infrared aters is that the heat generated urms the track and ground objects thout heating the surrounding air. nce the energy waves emitted by the s generator strike the track, they are insformed into heat and the track aterials then act as radiators themves and reradiate heat.

Like light rays, infrared rays may directed and controlled. This is ne by means of reflectors which may straight sided to give a spread patrn, or parabolic where a more dictional pattern is desired. The units ay be mounted overhead or on the le at an angle. The Amarillo installan uses parabolic reflectors which are ounted over the tracks.

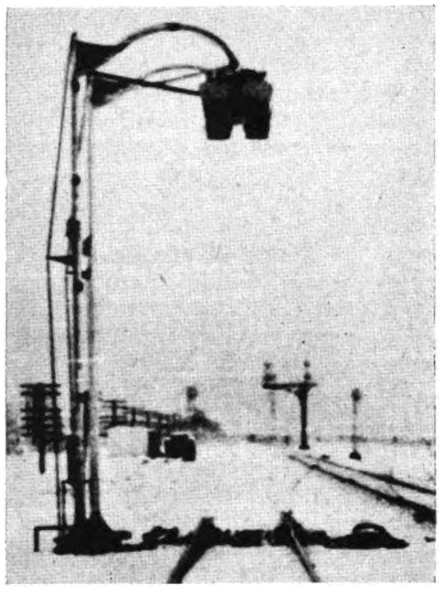
The heaters used in the Santa Fe tallation are the Schwank-Perfecn infrared generators manufactured Perfection Industries, Cleveland, hio. Both natural gas and propane s, the latter supplied in 1,000-gal nks, have been used for fueling them. hey are of the marquee type and are ounted in two banks of three generars each at a height of 23 ft above e track. The burners have a total put of 288,000 Btu per hr. About 50 r cent of this fuel energy is conrted into usable infrared radiant at. This amount is reported to be out twice the potential needed to ndle the heaviest snowfall in Amallo.

The heaters turn on and off autoatically. They are controlled by both mperature and moisture. Before the eaters will ignite, there must be a mbination of both low temperature nd sufficient moisture to activate a ermostat and a moisture-sensitive lectronic switching circuit at track vel. Low temperatures alone will not ctivate the generators.

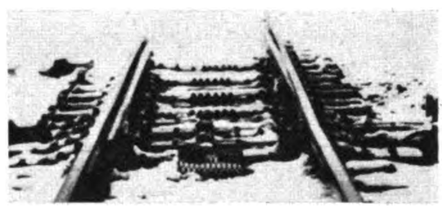
Reports are that the performance of the Amarillo installation has been encouraging. Although no really heavy snowfall occurred there last winter, 7 to 8 in. fell in 9 hr on March 17, accompanied by 30-mph winds. The heaters, it was reported, kept the area dry and free of the snow which had fallen.

To further the tests, additional units have been installed as follows: One at Joffre, N. M., two at Tejon, one at Mountainair, two at Keoto and one at Wootton, the latter three being on Raton mountain. These units are similar in design to the Amarillo installation except that they utilize a newer model generator that contains a motor and blower to pressurize the housing against wind. However, the road reports that wind has not been a problem with the older model installed at Amarillo. Even with 60 to 70 mph winds, the pilot flames remained steady.

It is reported that the major problem encountered so far has been one of reflector design. The reflectors on standard models spread the infrared rays over a 40-ft circle. To conserve this energy and improve unit efficiency, Santa Fe officers feel the rays should be concentrated over the switch only. The installations on the Santa Fe have full parabolic reflectors that tend to confine the rays to the switch area only. ●



Infrared heaters are mounted overhead so that heat is directed downward to the switch area. Radiation warms track and ground (below), but not air.



CHECK SWITCH HEATERS NOW

C&NW Fits Heater Power to Needs

A timing device which permits the power input to be regulated in accordance with prevailing storm conditions and keep maximum power demand at a minimum is a feature of an installation of electric switch heaters at an important interlocking on the Chicago & North Western. Another feature is that the heaters, which include ballast heaters, may be turned on and off by flicking a switch in the control tower.

The installation was made last year when the road consolidated four of its Chicago interlockings into one plant at Clybourn Junction. In connection with this project the snow-protection facilities at 21 of the turnouts were modernized.

A consideration in the selection of

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electric switch heaters for this installation was the fact that the road purchases power from a local producer for air conditioning the new interlocking tower, as well as for powering local signal facilities. Hence, even with the additional demand charge, a favorable rate was available which makes the use of electric switch heaters relatively economical. Furthermore, since the power company has a reputation for maintaining continuous service, the power source was considered highly reliable.

In the design of the new switch-heater system consideration was given to the fact that water from melted snow could build up in the ballast cribs and later freeze, with the possibility of icing in the switch rods and immobilizing the switch. To avoid this situation, Q & C ballast heaters were installed, with two being placed under each of the No. 0 and No. 1 switch rods. Water in these areas now either seeps into the ground or escapes otherwise from the cribs.

For heating the switches Chromalox electric heaters were used. These were installed along the outside of the stock and straight rails that mate with the points. They were positioned along the webs of the rails 1⅞ in. above the base of rail. The Racor Security rail braces supporting these rails were machined to provide a ⅜-in. slot for the heating cables. Lengths of the heating cables were varied to conform with the 19-ft 6-in. 25-ft and 30-ft switch points used in the plant layout.

Conservation of power was another design consideration. The C&NW wanted to provide enough heating capacity in the system to keep the switches operable under the most adverse temperature, wind and snow conditions which could be expected at this location. But, since the preponderance of storms could be expected to be less severe, it was also desirable to limit the use of power by installing an electrical system that could be easily adjusted to suit varying storm conditions. This problem was solved by incorporating an effective timing device in the system and installing it in the interlocking tower.

This device is a Zenith motorized cycle timer on a one-minute continuous rotation with a five-position selector switch. It regulates six control centers, each of which is activated to turn power on and off through contactors and circuit breakers to the switch and ballast heaters under control. The six control centers pow the heaters for the 21 switches, thr controlling three switches and th controlling four switches.

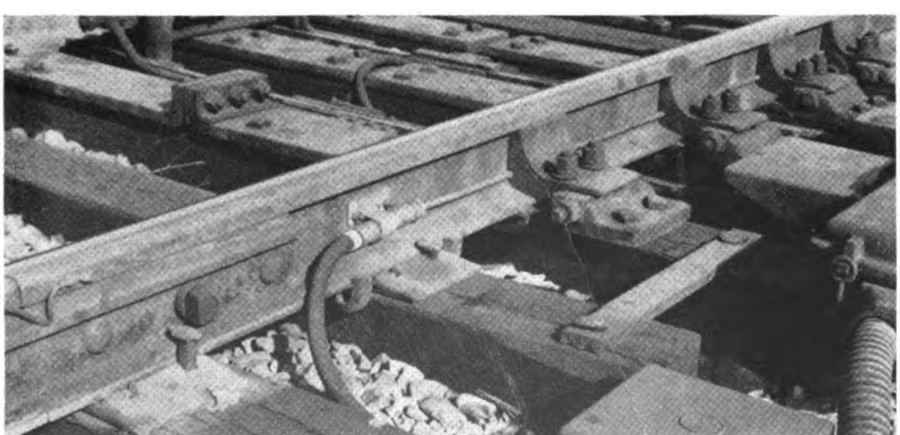
The timer is so constructed that directs each control center to ta power for a period of 20, 30, 40, or 60 sec, depending upon the positi at which the selector switch is set. any particular setting the timing mec anism is such that the heaters in ea control center are receiving continuo power for a portion of each min (20 sec, 30 sec, etc.). During course of each minute the power tates consecutively between cont centers on an overlapping basis. T arrangement assures a steady pow consumption.

When the selector switch is set its first position, one-third of the pe load is being used and two cont centers are taking power at the sa time. At the second position, one-h of the peak load is being consumed three control centers at one time. the third position, two-thirds of peak load is being taken by four co trol centers at one time. At the four position, 81.25 per cent of the pe load is being consumed for 45 sec each minute by five control cent simultaneously. When set at the fi position, the peak load is being us and all of the heaters are powered the full minute.

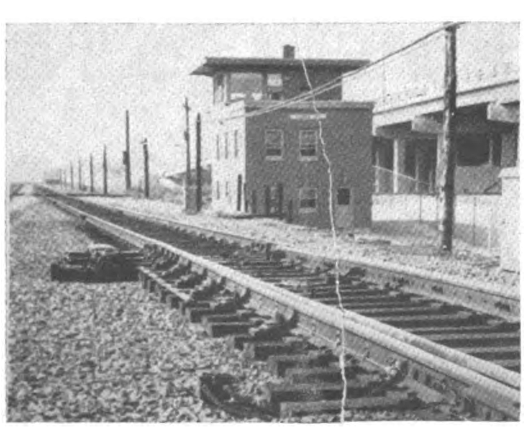
To activate the system, the tow operator throws a switch on the tim Initially, he sets the selector switch at the first position. If he observes th the snow is not melting fast enou and is accumulating at the switch after a reasonable period of operatio he then turns the selector switch to second position. He continues to o serve the snow-melting process and a justs the selector switch until switch points are clear of snow.

The timing device has indicati lights on its cover to reveal how it functioning. Five red indicating ligh show the position of the selector switc Also, there are six green indicati lights each of which lights up when t control center it regulates is taki power.

The road reports that its experien to date with this installation is limit owing to the fact that it has been service only during one mild wint However, the heaters functioned sati factorily during two bad snow storm one of which deposited an 8-in. sno cover in about 10 hours while the oth dumped 13 in. of snow in 20 hour The road also reports that the electr switch heaters proved economical.



Above: Switch heater cables are mounted along the web of the rails. A ⅜" slot was machined in the rail braces to take this cable.



Right: Controls in the interlocking tower regulate the flow and time power is fed to the heaters to meet the varied snow conditions.

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