

338 miles, and is divided into two engine districts at Horace. Before water treatment it was necessary to take out a "V" of flues every four to six months and clean out the scale, and to renew the entire set after 10 or 12 months' service. The flues in locomotive boilers are now run from 30 to 42 months. Instead of $\frac{1}{4}$ -in. scale on the flues when they are removed there is less than $\frac{1}{16}$ -in. scale. An engine running on one district could not work on another without several weeks of bad leaky troubles but engines are now operated through from Hoisington to Pueblo without any difficulty.

On the district between Kansas City and Omaha, we formerly experienced considerable trouble with leaky staybolts, making it necessary to hold an engine for staybolt inspection and repairs about three days per month. Since the complete treatment of water supplies was put into effect we have practically eliminated the leaky staybolts and engines can be returned to service in much less time.

As an example of water treating results for stationary boilers at our Sedalia, Mo., power plant, where water is treated for five Babcock and Wilcox double-deck water tube boilers of 275 hp. each, about 650 of the 840 four-inch tubes were in service 12 years, using treated water. The raw water here contains about 20 grains per gallon of incrusting matter or nearly three pounds per 1,000 gal. and with its use untreated, tube failures were frequent and the scale heavy and very hard.

Many such individual instances can be cited but it is probable that any other railroad, which has given careful attention to its water problems, can do likewise. In fact, although we cannot say our scale troubles have been eliminated, they have been materially reduced. Also although engine failures from leaking have not been entirely eliminated, it is a fact that they are becoming very rare.

A factor which must be given attention in the correction of water supplies is the matter of organization and supervision. The best and most expensive apparatus will not give results unless operated correctly and regularly. If a water treating plant is not run properly it is worse than useless. Not only is the investment a loss but expected results are not secured and the entire plan is discredited. Only by careful and systematic organization and by placing definite responsibility, can good results be secured. The methods which have been established and worked out for taking care of these facilities on the Missouri Pacific are as follows:

The water supply supervision is centered in the engineering department, an engineer of water service being placed in direct charge. Small laboratories in charge of traveling chemists have been installed at Little Rock, Kansas City and Osawatomie, Kan. Samples of both raw and treated water are sent from each treating plant to the designated laboratory on each Wednesday and Saturday where tests are made promptly and reports are furnished to all concerned. Any indication of unfavorable tests results in an inspection of the plant on the ground. The treatments are governed largely by the inspection of conditions in boilers and the chemical tests are made to assure water being maintained in a condition found to be most favorable. The traveling chemists in the course of their inspection, consult freely with operating officers, general and division master mechanics, roundhouse and boiler foremen and others interested and any complaint is taken care of without delay. The engineer of water service and general boiler inspector co-operate with each other and all concerned. In this manner water troubles are adjusted and minimized.

A point which is always brought up in a discussion of water treatment is the question of foaming. It is a fact that as a general rule when a water softening plant is put in service considerable foaming complaint results. This is also more or less true when an engine is transferred from one district with one quality of water to another with different water. In most cases, this trouble stops after a few

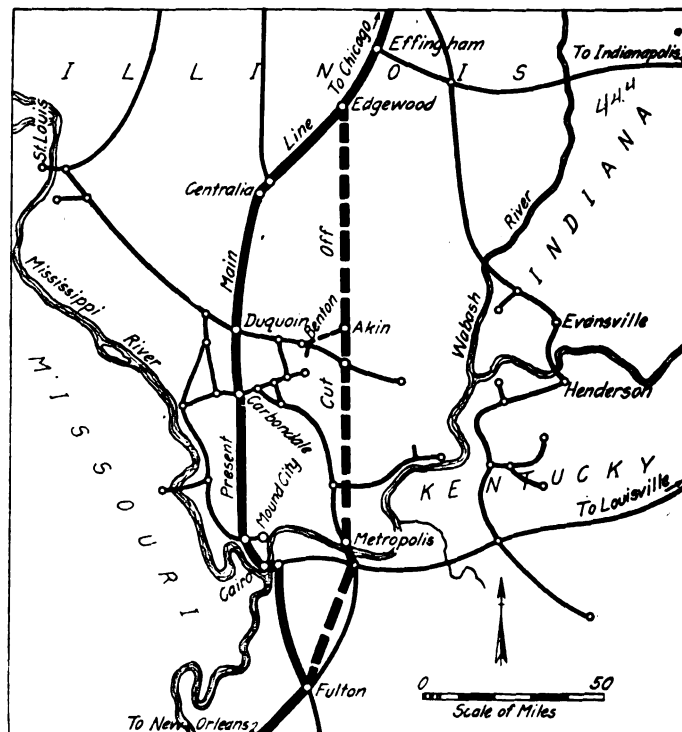
weeks. We have had some foaming trouble on the Missouri Pacific but with the use of an anti-foaming preparation, which is essentially a weak acid emulsion of castor oil made up by our chemical department, this trouble has been kept at a minimum.

The chief difficulty encountered with boiler waters at present is pitting and corrosion. The solution of this problem is still under study to determine the cause more exactly, but in this connection it can be said that while our present system of treatment has not eliminated this trouble, the improvement in conditions has been very marked.

In summarizing, permit me to emphasize again the importance of careful and conscientious study of water supply problems by a specially trained organization. This, together with close co-operation between the water service, operating and mechanical departments, will insure remarkable and satisfactory results and economies. Our experiences on the Missouri Pacific, where treating plants have been installed and properly supervised, have proven conclusively that these results can be accomplished.

Illinois' Central Preparing to Build Big Cut-off

ONE OF THE LARGEST engineering projects undertaken by a railway in recent years is the construction of a new single track line by the Illinois Central from Edgewood, Ill., to Fulton, Ky., a distance of 168.6 miles. This line will be in the nature of a main line cut-off, shortening the distance between Fulton and Edgewood by 22 miles.



The Relation of the New Line to the Old

It will also afford a reduction in grades from a maximum of 1.2 per cent on the existing main line to a maximum of 0.3 per cent and in addition will eliminate heavy curvature. A distinctive feature of the line will be a tangent 60 miles long extending from Edgewood south to Akin, where a connection will be made through Benton with the coal mining district of southern Illinois. From Akin the line will extend

generally southward to Metropolis where the Ohio River will be crossed by means of the Metropolis bridge, in which the Illinois Central has acquired a joint interest with the Chicago, Burlington & Quincy and the Nashville, Chattanooga & St. Louis.

The project is primarily the culmination of efforts to relieve congestion on the existing main line, which crosses the Ozark mountains and runs directly through the southern Illinois coal fields, which are largely served by the Illinois Central. Although this line is double-tracked throughout with three tracks for a part of the distance, it is taxed to its capacity, the coal business originating in the vicinity and the consequent switching required having so increased as to interfere seriously with the movement of the heavy trunk line business, a large part of which is fruit and other perishables, requiring high speed movement. The new line eliminates the necessity of building additional third track, revising alinement and grades and improving terminal facilities, all of which it was estimated would cost more and be less satisfactory than the plan adopted.

A collateral feature which entered into the consideration of the new line was the desirability of providing a shorter haul for a large volume of coal mined in southern Illinois and moving to Chicago. The advantage of securing this shorter haul, it is estimated, in itself justifies the building of the new line from Akin to Edgewood. Another feature which also entered into the plan was the desirability of increasing the capacity and otherwise improving conditions on the line from Fulton, Ky., to Louisville, Ky., over which a heavy business is also handled. The new line will cost in the neighborhood of \$15,000,000.

Controversy Over Central Pacific Settled

WASHINGTON, D. C.

PRACTICALLY ALL OPPOSITION to the Southern Pacific's application for authority to acquire the Central Pacific was withdrawn when the case came before the full membership of the Interstate Commerce Commission for argument on January 19. Instead of presenting arguments on the merits of the case, which had caused an acrimonious controversy between the Southern Pacific and the Union Pacific, in which a large number of the shippers and business men's organizations and State authorities of the West had taken sides, the time was devoted to a discussion of the proposed conditions to be imposed in case the commission's decision is favorable to the application, which were submitted to the parties in the case in a letter from Chairman Meyer of the Commission on January 3, as reported last week. The Union Pacific announced its readiness to withdraw its opposition if these conditions were made a part of the order and a general acquiescence in this plan was expressed by all interests except the Oregon railroad commission, which is attempting to make use of this opportunity to secure the building of more railroads in Oregon by insisting on a condition in the order requiring the Southern Pacific to allow joint use over a proposed extension of the Central Pacific's line into Oregon, known as the Natron cut-off, to railroads that shall build across Oregon from east of the mountains in order to give them entrance into the Willamette Valley and to coast points.

The proposed conditions are designed to secure for the future complete equality of rates and service via the Central Pacific's Ogden gateway and the Portland and El Paso gateway, thus removing the Union Pacific's objection to Southern Pacific control of the Central Pacific on the ground that it would give the Southern Pacific an opportunity to subordi-

nate the Ogden route in favor of its Southern route. The Interstate Commerce Commission has not yet announced whether it will approve the Southern Pacific's application, but the discussion before the commission was based on the assumption that the commission would issue such an order subject to the conditions outlined. None of the representatives of the shippers that had testified at the hearing made an appearance at the argument, but their views had been expressed in letters and telegrams to the commission.

It is understood that the plan was proposed to the commission by the Southern Pacific after the assent of the Union Pacific had been obtained and it was then submitted to the various intervenors in the case in the form of the notice from the commission on January 3 that it had been suggested to it for specific consideration in case it decided favorably on the Southern Pacific application. Any order from the commission, however, will be submitted to the courts, as the Supreme Court has ordered a separation of the Southern Pacific and the Central Pacific under the Sherman law.

F. H. Wood, commerce counsel of the Southern Pacific, said that the Southern Pacific had seen most of the replies sent to the commission in response to the notice of January 3 and that their tenor appears to be general acquiescence in the suggestions except in a few instances where additional conditions or modifications of the conditions had been suggested and that he was prepared to say that the entry of an order under the conditions suggested would be acceptable to the Southern Pacific. Chairman Meyer said that a later telegram had been received from the Chicago Association of Commerce cancelling its previous telegram and stating that it is now in accord with the provisions of the commission's memorandum. Commissioner Potter said, however, that the previous telegram of January 16, which took the position that the plan had still left the possibility of Southern Pacific control of the Central Pacific being used to the detriment of connections other than the Union Pacific at Ogden and Salt Lake City, had left an impression on his mind that had not been removed by the second telegram and that he would not be willing to sign an order deliberately discriminating against the other lines. Mr. Wood replied that a similar objection had been made by St. Louis but that in his opinion the Central Pacific route would be open to all connections.

The replies indicate, Mr. Wood continued, that there is now no dissent to the proposal that the Central Pacific remain in the control of the Southern Pacific; the principal objection was that of the Union Pacific, which took the position that such control would deprive it of the rights it claimed under the Pacific railroad acts and would put it in the power of the Southern Pacific to subordinate the Ogden route in favor of the El Paso route, to the detriment not only of the Union Pacific but of other connections primarily dependent upon the Ogden route. The proposed conditions meet this objection by insuring equality of rates, time and service over these two routes, he said, because they completely protect the Union Pacific in its rights acquired by the Pacific railroad acts as well as the public interest in the Ogden route and prevent the Southern Pacific from subordinating the Ogden route in any way to the El Paso route. They are also designed to prevent the Southern Pacific from undertaking to neutralize the effect by solicitation to prevent the normal flow of traffic which would seek the Ogden route under an equality of opportunity. Mr. Wood added that of course the shipper is in no way deprived of his legal right to route his freight. That the plan is in the public interest as well as in the interest of the Southern Pacific and the Union Pacific is demonstrated, he said, by the attitude in which the public has received the proposal.

When Commissioner Eastman asked what would be the effect of a violation of any of the conditions Mr. Wood said that it would be within the power of the commission to withdraw its authorization and revoke the lease. Returning