(*d*) Rearrangement of pipe lines, including reversals, relocations, loopings, and extensions.

(*e*) Construction of one or more new pipe lines.

Through established industry committees under the Office of Petroleum Coordinator, all movements of petroleum are being directed generally east and north. Cross hauls and back hauls are being eliminated with all possible dispatch. These procedures save transportation and in effect produce ton-mile movement generally eastward.

As efficiency of the facilities to deliver petroleum and petroleum products to the eastern seaboard is the most important factor, the Office of Petroleum Coordinator has examined the proposals now before this committee principally from that point of view.

Our investigations have developed the following information concerning the relative efficiency of steel, which would be required to move 300,000 barrels per day of crude oil from Texas to the Philadelphia-New York area:

1. We have derived these figures, which have increased in significance, from shipments by barge from Port Arthur, Tex., via Gulf Intracoastal Waterway and Mississippi and Ohio Rivers to Pittsburgh; thence by pipe line to the East—0.50 of a barrel per day per ton of steel employed.

2. By tank car, including power, but exclusive of the steel in the rails—a ton of steel will move 0.52 of a barrel per day per ton of steel employed.

3. By pipe line (the proposed 24-inch line from Longview, Tex., to the East)—0.86 of a barrel per day per ton of steel employed.

4. By tank ship, under efficient convoy, but with no allowance for steel in convoy vessels or probable sinkings—a ton of steel will move 0.87 of a barrel per day per ton of steel employed.

From the above it should be noted that the least efficient method in terms of the use of steel is steel barge expansion, although it may still be the cheapest method in money cost.

Mr. RANKIN. If you went down through the Intracoastal Waterway, and through the Florida Canal, what would be the steel usage per barrel?

Major PARTEN. We made an appraisal of the comparative figures that were submitted by Mr. Buckman, in company with Senator Pepper, and taking the identical figures submitted by Mr. Buckman, the tonnage of steel involved to move 250,000 barrels—not 300,000 barrels—by combination of barge and pipe line, or by barge across Florida and by barge up to the Intracoastal Canal and on to New York, was 450,000 tons of steel in the barge program and pipe line. Placing that against your 250,000 barrels per day, you have an efficiency figure of 0.55.

Mr. RANKIN. That is where you would have to have a pipe line and several barge lines, but if you could transport it across Florida, what would the figures show? In other words, you have taken the most treacherous route there by the Mississippi, the Ohio, and Monongahela Rivers, and you would be traveling upstream all the time.

Major PARTEN. I would say, Mr. Rankin, that it would improve the efficiency of the figures to some point. It would probably be some point about 0.6.

Mr. RANKIN. You have based your figures entirely on the use of steel barges?

Major PARTEN. Yes, sir.