



## LONG NIGHT OF THE TANKERS: HITLER'S WAR AGAINST CARIBBEAN OIL

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## WHITE CHRISTMAS

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The Hollywood blockbuster for the fall of 1942 was the musical *Holiday Inn* with Bing Crosby, Fred Astaire, Marjorie Reynolds, Virginia Dale, and Walter Abel. Released in August, the picture became a national phenomenon in just a few months. As summer gave way to fall the movie's big number, "White Christmas," written by Irving Berlin and sung by Crosby, became the unofficial anthem of the holiday season for the rest of the war. By the end of November 1942, more than 600,000 records as well as more than a million copies of the sheet music had been sold. "White Christmas" became the longest-running song ever played on the weekly radio show "Your Hit Parade." In that dreary Christmas of 1942 – the second Christmas coming in the midst of war in the United States – Berlin's melancholy words gave voice to the heartfelt wishes of millions of Americans, at home and overseas, for a Christmas more joyous and brighter than the one they were about to celebrate.

A modern American Christmas is a holiday of light – the colorful Christmas lights of homes and businesses, shop windows all ablaze, every city and town putting a tableau of the manger in Bethlehem by the old court house or town square, home fireplaces and Yule logs, and the national Christmas tree on the White House grounds. But that year the deepening energy crisis in the United States, and especially in the country's most populous region and the heartland of its industry – the northeast and the Ohio River Valley – made Christmas a lot darker. Outdoor holiday lights were dimmer where they were found at all. Posters everywhere exhorted Americans to save energy for the fight at the front and for the production of the machines of war that would ensure victory. Coal, oil, and gasoline for personal civilian use were tightly restricted. Car trips

to visit family were virtually out of the question. On top of all that, it was a cold and dry winter with little snow. Well did Americans wish for a white Christmas that year.<sup>1</sup>

The severe energy and particularly oil shortage in the American northeast (and eastern Canada) was the inevitable result of the war that Admiral Karl Dönitz's "gray sharks" had been waging against all shipping since September 1939, but especially against tankers. Tanker losses had started to mount over the winter of 1939–40, but the Anglo-French allies had initially been able to counter those losses by leasing neutral tankers, rationalizing tanker traffic, convoying, and other means. The constant struggle to preserve tanker capacity, and possibly to build more tankers than the enemy was destroying, suffered a severe blow with the entry of the United States into the war. Suddenly, every tanker in the Atlantic, the Gulf of Mexico, and the Caribbean was at risk.

Shortly after his American offensive began, Dönitz told the German people over the radio: "Our U-boats are operating close in shore along the coast of the United States ... so that bathers and sometimes entire coastal cities are witnesses to the drama of war, whose visual climaxes are constituted by the red glorioles of blazing tankers."<sup>2</sup> Those "red glorioles" erupted 64 times between mid-January and mid-June 1942, when as many tankers (along with 62 other ships) were sent into Davey Jones' Locker off the US east coast.<sup>3</sup> But these were not the only tankers lost in American waters or in proximity to American waters; from the opening of the submarine offensive in the Caribbean on February 16, 1942, until the end of that year, another 75 tankers were destroyed in the Caribbean, along with 310 other ships.

Every tanker loss meant that nearly 100,000 passenger cars on the east coast would be devoid of gasoline; 35,000 homes or small businesses would suffer with little or no heating oil for up to a year. The average tanker on an east coast run carried 80,000 barrels of oil up from the Gulf or the Caribbean every 20 days, thus delivering 4,000 barrels a day. This translated into 1.5 million barrels per year of carrying capacity.<sup>4</sup> When multiplied by the 222 US, British, and other Allied or Allied-chartered tankers lost in 1942,<sup>5</sup> the impact was staggering – 330 million barrels of carrying capacity lost. The Germans did almost no damage to the drilling, lifting, or refining capacity of the United States, Venezuela, or Trinidad.

But they were making it very difficult to get any of that oil to points vital to the Allied war effort.

The result of the great damage to the transporting capability of the tanker fleet was felt up and down the line. In the first six months of 1942, Venezuela was forced to curtail production by 12.5 million, Mexico by 2.95 million, Colombia by 1.15 million, and Trinidad by 0.2 million barrels. The oil could not be shipped, so it had to be left in the ground – “shut in” – or stored somewhere near the drilling site.<sup>6</sup> No one had foreseen the need for major oil storage facilities, so the oil was left in place. Local and even national economies suffered. United States production destined for the northeast was drastically cut back. No pipelines existed to carry oil from Texas or Louisiana to New York or New Jersey.<sup>7</sup> Daily tanker shipments from the Gulf of Mexico to the eastern seaboard dropped from the 1941 average of 1.42 million barrels per day to just 391,000 barrels in 1942.<sup>8</sup> The excess was either shut in or stored in local tank farms.

Here, too, production stopped, workers were laid off, local economies suffered. As early as the beginning of March 1942, Texas oilmen began to talk about reducing production by at least 10 per cent to ease the growing demand for above-ground storage.<sup>9</sup> As early as the end of the first week of March 1942, US east coast stocks were 10.74 million barrels lower than they had been the previous year. British imports of both crude and petroleum products fell from 12.3 million tons in 1941 to 9.9 million in 1942, while total imports of refined gasoline, for both motor and aviation use, dropped from 4,768 tons per week in 1941 to 4,115 per week in 1942,<sup>10</sup> even as demand rose. Put simply, the Germans were sinking tankers far faster than Allied shipyards could replace them.<sup>11</sup> On March 12, 1942, Prime Minister Winston S. Churchill wrote President Franklin D. Roosevelt: “I am most deeply concerned at the immense sinkings of tankers west of the 40th meridian and in the Caribbean Sea.”<sup>12</sup> General George C. Marshall, Chief of Staff of the US Army and Roosevelt’s chief military advisor, was somewhat less prone to dramatic statements than Churchill, but even he told Admiral Ernest J. King in June 1942, “The losses by submarines off our Atlantic seaboard and in the Caribbean now threaten our entire war effort.”<sup>13</sup>

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For civilians in the United States, Great Britain, and Canada, the most direct link between the slaughter of the tankers and their daily lives was the elaborate system of rationing and controls over energy consumption that would ultimately limit their ability to drive their cars or heat their homes and workplaces. But civilian demand was not a significant part of the problem. It was the newly and greatly expanded demands for war production – oil for everything from chemicals to explosives, plastics, and rubber; to pave new runways; to provide rainproof ponchos for the infantry; hydraulic fluid for brakes for motor vehicles and aircraft; and, most importantly, aviation gasoline for bombers and fighters. The ultimate solution to these shortages was to destroy the Nazi regime and the submarine fleet it had created; everyone knew that would take some time. In the interim, there were three solutions: in the short term, rationing; in the intermediate term (for the United States), transporting oil without tankers; and in the long run, building more tankers and sinking more submarines. Britain had imposed rigid controls over consumption, distribution, transport, and storage of oil and petroleum products almost as soon as the war began in the fall of 1939. In July 1942, even further cuts were made and no gasoline was allowed for civilian uses except for 40,000 individuals living in remote areas of the British Isles who were allowed to drive up to 120 miles per month.<sup>14</sup>

In the late winter and spring of 1942, Americans too began to feel the pinch. An immediate halt in the manufacturing of private cars and the shift of the auto industry to army vehicle and aircraft production essentially froze potential growth in the number of civilian vehicles on the road. On April 16, 1942, supplies of gasoline to retail dealers was curtailed by one third. A month later a temporary ration of five gallons per week for civilians was imposed on the east coast. On July 1, a permanent limit of 16 gallons a month was imposed on drivers west of the Appalachians; 12 gallons a month for those on the eastern seaboard.<sup>15</sup> Fuel oil to heat private homes was also cut; citizens were told to convert to coal and to keep their thermostats at 65° F during the daytime and 55° F at night.

The British, Americans, and Canadians faced two separate but related problems. For Britain, the tanker shortage meant less oil and petroleum products, period. For Canada and the United States, lost tankers created internal distribution problems of the first magnitude. Sufficient

oil was produced and refined in the Canadian West to take care of local demand, but eastern Canada was heavily dependent on tanker-borne supplies from the Caribbean. Tanker losses – and shifting tankers from the eastern Canadian trade to other purposes – put enormous pressure on Canadian supplies. In the United States, the tanker shortage had its most serious impact on the east coast because of the roughly 576,000 barrels a day that flowed into the region; 414,000 barrels from the Gulf of Mexico and 115,000 from the Caribbean came by tanker and only 46,000 barrels by rail, truck, barge, or pipeline.<sup>16</sup> The challenge, then, was to replace as much of the tanker-borne oil flowing to the east coast as possible by other means.

Railway tank cars were the most obvious replacement. In June 1941, Harold L. Ickes, Roosevelt's Interior Secretary and recently appointed Petroleum Coordinator for National Defense, began to press the oil companies to make greater use of tanker cars to supplement sea-going tankers. But Ickes faced several obstacles. First, it was at least ten times as expensive to move oil by rail as it was by sea. Second, any open move to coordinate the flow of oil by rail between the largest oil companies and railroads might easily be construed by the Department of Justice as a form of trust or monopoly, and thus prohibited by America's tough antitrust legislation. Third, the railroads had little infrastructure to handle large traffic in oil, either loading and storage facilities or branch lines to enough terminals. Ickes thus urged the Interstate Commerce Commission to allow railroads to set rates for petroleum shipment that would produce richer returns while he won permission from the Department of Justice to encourage the major oil companies to pool reserves and coordinate shipments with the Association of American Railroads.<sup>17</sup> At the same time, grain cars and liquid gas cars were converted to oil carriers.

Ickes' campaign produced quick results. By March 1942, some 13,500 tanker cars a week brought more than 435,000 barrels of oil to the east coast. Given the greatly increased wartime demand for oil and petroleum by-products in March 1942 over March 1941, it wasn't nearly enough, but it was a start. Tanker trucks were also used to supplement rail deliveries – the War Production Board issued exemptions for the manufacture of tank trucks while states (Pennsylvania Turnpike) suspended rules that barred tanker traffic from some trunk highways.<sup>18</sup> Another, though much slower,

alternative was to ship oil and other petroleum products by barge up the Mississippi and via the great rivers of the eastern and central states such as the Ohio and the Tennessee, as well as the extensive barge canals built in the nineteenth century. A barge starting at Corpus Christie, Texas, might make its way as far as Pittsburgh, or via the Missouri River, the Illinois Waterway, and the Great Lakes to Cleveland and even Buffalo.<sup>19</sup> Lake tankers were pressed into service to off-load oil from barges at major terminuses and carry it to lakeside cities such as Chicago. In June 1941, about 95 per cent of the petroleum deliveries to the east coast were made by tanker. In April 1945, only 22 per cent were brought by tanker, while 30 per cent came by rail and 8 per cent by barge. But, by then, the remaining 40 per cent came by pipeline.<sup>20</sup>

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There were about 100,000 miles of oil pipelines moving more than three million barrels of crude oil and petroleum products in the United States in 1940, none larger than eight inches in diameter, and none from the major oil-producing regions in the southwest to the east coast. The trunk lines that did exist connected loading facilities in Texas, Louisiana, Oklahoma, and New Mexico to the Gulf of Mexico and its large tanker loading docks. A number also connected the southwest to California and to mid-west refineries.<sup>21</sup> The heavy reliance on sea-borne oil to sustain the east coast posed no significant inconvenience to the oil industry or the public until the start of the war in 1939, and most particularly the surrender of France in June 1940. The subsequent slaughter of the tankers in the North Atlantic and off the US east coast after Pearl Harbor as well as in the Caribbean after February 16, 1942, convinced almost everyone involved in the business of organizing wartime energy supplies that the only real way to replace the tanker traffic was via a new emergency pipeline from Texas to the east coast.

Ickes had warned Roosevelt in July 1940 that “the building of a crude oil pipeline from Texas to the East might not be economically sound [in peacetime]; but in the event of an emergency it might be absolutely necessary.”<sup>22</sup> The problem was that the United States was not yet at war and in 1940 no one could foresee if it would join the conflict, or when. In the



meantime, the president's chief objective was to begin the long and complex job of building up American military strength. The United States was so weak in the summer and fall of 1940 that it could barely field a single modern, well-trained, armored division.

On May 27, 1941, Roosevelt declared an unlimited state of national emergency; the next day he named Ickes oil tsar. Ickes' war emergency duties were aided by the establishment by executive order of the Petroleum Administration for War (PAW) on December 2, 1941, with him as Petroleum Coordinator for War. As Secretary of the Interior, Ickes had been a strong conservationist and no friend of the oil industry, but he saw immediately that he could not succeed in preparing the United States to fight a modern oil-based war without industry's cooperation. He overcame Big Oil's misgivings by inviting the managers of the nation's largest companies to join him to coordinate war supplies for energy, while he also persuaded the Department of Justice to relax its investigations, and prosecutions, of companies that cooperated with each other, especially in the shipping of oil.

The companies responded with the creation of the Petroleum Industry War Council, a voluntary association of all the major American oil producers, with several important subcommittees such as the Petroleum Economics Committee and the Transportation Committee. Their intention was to help the war effort in any way possible but primarily to – in effect – create one large oil consortium for the duration. As one dramatic example, companies even pooled gasoline, despite the near religious fervor with which one company's brand had been extolled over another's during peacetime. Ickes and the oil industry accomplished a great deal before the United States was dragged into the war, but it was not nearly enough to offset the disastrous loss of tankers that began in February 1942.

When the impact of the tanker losses was first felt, Ickes and the oil companies bore down hard on solving the growing shortage of east coast oil by using existing pipelines, railroads, and barges; by pooling, exchanging, and sharing facilities and equipment; and by speeding up construction of tankers, of which more than 800 were built by the United States alone by 1945.<sup>23</sup> But Ickes remained convinced that a war emergency pipeline from Texas to the east coast was the only long-term answer. As early as September 1941, he had formally requested the Supply Priorities and



Allocations Board (SPAB) – responsible for allocating all strategic materials and supplies in the immediate prewar period, soon to be replaced by the War Production Board – to provide enough steel to build a 24-inch pipeline under the auspices of the newly incorporated National Defense Pipe Lines Company. The SPAB had rejected the request.

Ickes pushed on. He had the authority to quickly get rights-of-way for construction from the Cole Pipeline Bill, signed into law by FDR on July 30, 1941, which bestowed on the president the power to designate any proposed pipeline as necessary to the nation's defense and to confer on its builders the right of eminent domain – that is, the right to expropriate property at fair market value, if necessary, over the objections of the property's owners.<sup>24</sup> The pipeline industry was heavily involved in Ickes' bid, with eleven companies offering to finance and build the new line. Such a project would require hundreds of thousands of tons of new steel for pipe, pumps, valves, storage tanks, and loading facilities. The SPAB rejected the project again. As far as it was concerned, the steel was needed for more important things – ships, tanks, aircraft, guns, helmets, even bayonets. Oil transportation would have to make do for the moment. Two days after Pearl Harbor, the National Defense Pipe Lines Company was dissolved.

The SPAB held fast to its opposition to the pipeline through the rest of the fall of 1941 and into the first half of 1942 – by which time it had been transformed into the War Production Board (WPB). On February 24, 1942, the latter rejected a third proposal for a Texas–East Coast pipeline. As *The Oil Weekly* declared in its edition of March 9, 1942:

In turning down Ickes' application [of the previous week], WPB accepted the SPAB [Supply Priorities and Applications Board] ruling of last November that the value of the line as a defense project was not great enough to justify the high priority ratings that would be necessary, and pointed out that materials shortages since that time have increased rather than decreased.<sup>25</sup>

On March 23, engineers and management representatives of 67 oil and pipeline companies, all members of the Petroleum Industry War Council, gathered for three days at the Mayo Hotel in Tulsa, Oklahoma, to hammer out a domestic pipeline strategy for the war emergency

period. The Petroleum Industry War Council's Temporary Joint Pipeline Sub-Committee was made up of some of the industry's foremost experts in pipeline construction and management, storage and shipment, and traffic control. They examined virtually every mile of existing pipe, every pumping station, every tank farm, and drew up a plan to effectively re-jig the existing national network for moving oil so as to increase the amount flowing to the northeast and to other areas where vital war activities such as ship construction were going on.

The resulting Tulsa Plan contained numerous recommendations for the reconfiguration and extension of existing pipelines, the increased use of alternate means of fuel delivery, specific measures to be taken by companies to increase the efficiency of supply, the use of old pipe, pumps, and meters on new lines, the reversal of pumping direction on some lines, and the tearing up of old pipe to extend existing lines. Even if those measures were to be adopted, however, the Transportation Sub-Committee concluded that the east coast would still be left far short of its minimum daily oil requirements. "There does not seem to be any solution but to build two big pipelines from the Texas area thru to the Atlantic Coast if tankers are not going to be available."<sup>26</sup> The Tulsa Plan was warmly received by the industry and accepted by Ickes on May 11, 1942. *The Oil Weekly* was optimistic that the next time Ickes, armed with the plan, went to the WPB for steel, his reception would be somewhat warmer: "It is expected the Office of Petroleum Coordinator will make another effort and there are indications that WPB may now adopt a more liberal attitude toward the project."<sup>27</sup>

Ickes did go back to the War Production Board on May 25. This time his argument was strongly supported by both the army and the navy. It was also dramatically illustrated by the brutal reality that some 100 tankers had been sunk off the east coast, and in the Caribbean, since the beginning of 1942. On June 10, the WPB approved a 24-inch crude oil pipeline – dubbed Big Inch – but only from Longview, Texas, to Norris City, Illinois. There, the WPB proposed that the pipeline feed into a tank-car loading facility for rail transportation further east. Four months later, the Petroleum Administration for War urged the WPB to approve allocation of steel and other materials for the line's extension to the east coast. Permission was granted on October 26 for a single 24-inch line

from Norris, Illinois, to Phoenixville, Pennsylvania, where two 20-inch lines would be built to New York City and Philadelphia.

At the same time, PAW told the Board that a request for a second line would shortly be made. That line, the Little Big Inch, was to be a 20-inch pipeline for carrying refined petroleum products from Beaumont, Texas, to Linden, New Jersey. PAW made the application on January 18, 1943. It was initially granted permission for the line to be built to Norris, Illinois, but then, on April 2, received the WPB's blessing for its extension to Linden, New Jersey.<sup>28</sup> Thus, whereas in the fall of 1941 the United States had no pipelines to carry crude or crude products from Texas to the east coast, now there were to be two large lines with a potential capacity of half a million barrels of product delivered every day. Concurrently, other national emergency pipelines and extensions of previous pipelines were built – such as the Plantation Line from the Gulf Coast through the Old South to Richmond – which considerably alleviated the oil shortage in the southeast.

But how to finance, build, and manage the Big Inch and Little Big Inch, and do so quickly enough to offset the growing tanker shortage?<sup>29</sup> That was the next and greatest challenge by far.

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The \$35 million cost for the first stage of the Big Inch line was advanced by the government-owned Depression-Era Reconstruction Finance Corporation. For the duration of the war, the line was to be owned by the Defense Plant Corporation and managed by War Emergency Pipelines, Inc., a consortium of 11 companies. WEP was also the prime contractor for the construction of the line, using dozens of private companies to do the surveying, trenching, pipe-laying, backfilling, and other essential work, including bridging and underground boring. W. Alton Jones, President of Cities Service Oil Company, was named president of WEP; Burton E. Hull as vice president and general manager.

A bluff, weather-beaten Texan, Hull had graduated from Texas A & M University in 1904 with a degree in engineering. Short and stocky, he was plain-spoken, energetic, and a born leader. He was considered one of the best pipeline engineers in the business and was determined to bring

the line into operation on time and on budget. On June 23, 1942, three days before the official contract was even signed, he put 15 surveying parties into the field to stake out a 531-mile right-of-way between Longview, Texas, and Norris City, Illinois. Williams Brothers, one of the country's most experienced pipeline layers, was selected as prime contractor. The National Tube Company, a subsidiary of US Steel, shipped the first train-load of 24-inch seamless pipe, 3/8-inch thick, on July 18; on August 3, construction got under way near Little Rock, Arkansas.

Hull's assistant, Major A. N. Horne, arrived in Little Rock on July 1 with nothing but a briefcase; Hull joined him two days later. The two men worked out of a steamy hotel room, sending telegrams and letters, making phone calls and hiring a traffic manager to work with them as they assembled the management team they would need to get construction launched. A few days later, they went to an auction to buy some used office furniture. On July 11, Hull summoned to Little Rock representatives from every pipeline contractor in the nation with the men and ability to handle heavy pipe; together they formulated a plan to get the job done by the beginning of January 1943.

The Big Inch line was to run 530.36 miles along a right-of-way 75 feet wide with pumping stations approximately every 50 miles. Eight principal pipe-laying crews, each between 300 and 400 men, worked on different sections of the pipe at the same time. Other crews – 18 of them – tackled the 33 river and stream crossings that were necessary, including one under the Mississippi River. It took 11 weeks to blast a trench in the river bottom and prepare it for the pipe. The standard method of construction on land was to dig a trench four feet deep and three feet wide, and lay the pipe into the trench with a side-boom tractor, usually from truck trailers. The inside of each section of pipe was swabbed by pulling a (necessarily small) man through the pipe on a cleaning pad with rags on his hands. The ends were then prepared for welding, after which the pipe was coated, wrapped and covered, laid back in the trench, and backfilled. Most of the necessary pipe bending was done on the spot. Rivers were crossed using 4,800-pound river clamps to hold the pipe to the bottoms.<sup>30</sup>

The pipe was laid through forests and swamps, over the Allegheny Mountains, across rivers, lakes, creeks, and tidal marshes, beneath streets and railroad rights-of-way, and through backyards. It traversed 95 counties

in ten states. At the same time, work began on large tank farms in Longview, Texas, and Norris, Illinois, and at a large facility at the latter to load tank cars either directly from the pipe or from the storage tanks. It was an incredible feat of wartime construction – some five months after the work on the initial section of the pipeline had begun, the first flow of oil from Longview to Norris (about 60,000 barrels a day) started through the pipe. The line had been completed so fast that sufficient storage tanks were not yet ready at Longview or Norris. No matter, oil was immediately transferred to tank cars and sent east. At the same time, construction on the eastern connection to New York and Philadelphia, started in November 1942, proceeded at a rapid pace. Most of this line was welded, not seamless, pipe supplied by Youngstown Sheet and Tube.

On July 19, 1943, the final weld was made on this eastern extension of the Big Inch at Phoenixville, Pennsylvania. By that time, 100,000 barrels a day were already being pumped into the pipe from fields near Longview, Texas, and from other fields in the state connected to Longview by newly built pipes. It moved along at 40 miles a day; when the pipeline was filled from end to end, it held five million barrels of oil. The trick was to run the pumps and operate the valves in such a way as to reach its full capacity of 300,000 barrels a day, which was done by the fall. At the same time, Little Big Inch construction moved rapidly ahead. This pipe was to carry gasoline, heating oil, and other products using rubber balls slightly larger than the diameter of the pipe, and inserted into the pipe, to separate the products being sent through. It could also carry crude, if necessary. The combined carrying capacity of the two lines was 500,000 barrels a day.

In the words of one major survey of the American oil industry in World War II, “The completion of Big Inch [in July 1943] marked the beginning of the end of the supply problem on the East Coast.”<sup>31</sup> The completion of Little Big Inch to the east coast in March 1944 “virtually solved the transportation deficiency to the east coast,”<sup>32</sup> according to the official history of the PAW. Although these two pipelines (and many others) that had been rushed to completion or extended added capacity that had not existed before 1941, older means of shipping also improved greatly. By 1944, pipelines delivered 662,559 barrels a day to the east coast (38.7 per cent of the total), rail cars 646,113 barrels or 37.7 per cent of the east coast supply, and barges and lake tankers (via Lakes Michigan, Erie, and



Pennsylvania section of the war emergency 24-inch pipeline to carry oil from Texas fields to eastern refineries, completed in July 1943. Willis Garner about to tack weld a section of pipe. Source: Library of Congress, Prints & Photographs Division, FSA/OWI Collection [reproduction number LC-USW3-015067-D (b&cw film neg.)].

Ontario) another 127,641 barrels or 7.5 per cent. Thus, the total amount of oil flowing to the east coast from overland routes was 1.4 million barrels a day by 1944, which was more than the total amount (tankers included) in 1942 or 1943.

The railroads did an outstanding job in collecting, modifying, and pooling tank cars and increasing tank-car deliveries to the east coast from 35,000 barrels a day in 1941 to 841,905 (or 61.3 per cent of the total) by 1943, but railway cars were in very high demand throughout North America to deliver all manner of war goods. Thus, as soon as the pipelines began to take up the slack with the completion of Big Inch and Little Big Inch, thousands of tank cars were diverted elsewhere to deliver other liquid goods or to be converted to carry dry goods.

The other factor that helped to ease the oil supply situation in the East was a crash program to build tankers. Sea-borne oil delivered to the east coast reached its high point in 1941, accounting for 1.4 million barrels a day or 92.5 per cent of the total. But that was prior to the war. After Pearl Harbor, tankers were sunk in large numbers, but tankers (including much new construction) were also grabbed up by the Royal Navy and the US Navy as fleet tankers. The US Navy had developed the art of refueling at sea in the interwar period in order to be able to reach the vast expanses of the Pacific Ocean. The Royal Navy was much slower to take up that challenge but was well into the practice by 1943. Hence, both used tankers for two purposes – to move supplies from port to port, but also to sail with their task forces and fuel at sea. Navies claimed first priority on new tanker construction.

The world has long been aware of the incredible feats of ship construction in the United States, Great Britain, and Canada that, by early 1943, was launching many more new bottoms than U-boats could sink. US “Liberty” ships were mass-produced, sometimes in a matter of days. But so, too, were tankers. One of the best new modern designs was the T-2 tanker, adopted from two prototypes – *Mobilfuel* and *Mobilube* – whose construction had started before the war. They set the pattern for 481 other T-2s built by 1945, many of which were taken over by the US Navy. All were over 500 feet long, displaced at least 10,000 tons, and were powered by steam-turbine engines with maximum speeds exceeding 16 knots. Put simply, they were larger, faster, and more powerful than most tankers afloat in 1940. And that meant that one of the unforeseen side effects of Dönitz’s war against Allied tankers was the rebuilding of a major part of the prewar tanker fleet to deliver more product, more quickly. By 1945, tanker deliveries to the east coast had increased from an average of 159,563 barrels per day in 1943 to 450,665 barrels a day.<sup>33</sup>

By Christmas 1944, the holiday lights were on again in most of the United States and the United Kingdom. Both had more than made up for the huge losses in tankers suffered in 1942 and 1943 on the eastern seaboard of the United States, on the trans-Atlantic routes, and on the runs from Venezuela to the Netherlands Antilles and on to Canada, the US east coast, and the United Kingdom. The U-boats would continue to haunt the Caribbean in late 1942 and 1943 – indeed, they would in small



numbers revisit for most of the war – but the outcome of the struggle had already been determined by the rapid construction of just over 1,000 miles of pipeline. The virtual closing of the Caribbean oil supply in 1942 had been a brilliant feat of the German submarine service, but the industrial capacity of the Allies, especially the United States, was more than a match for the U-boats. When led, organized, and driven by men such as Harold Ickes and Burt Hull, the thousands of welders, pipe fitters, pipe layers, engineers, earth-moving equipment operators, truck drivers, surveyors, riveters, pile drivers, boring machine operators, drillers, and just plain laborers neutralized the largest submarine force the world has ever seen.

