

Book 'Operation Pluto' : E.W.Middleton

Chapter headings and wordage :-

	Pages	Words	Headings
Chapter 1	14	pp393920	'The essence of victory'
33	2	19	5320 'Combined Operations HQ'
"	3	12	3360 'The steel pipe conundrum'
"	4	11	3080 'Making the HAIS cable'
"	5	11	3000 'Pluto ships and craft'
"	6	16	4480 'Force Pluto'
"	7	12	3400 'Trials and training'
"	8	22	6160 'The Underworld & Overlord'
"	9	17	4830 'Operation Dumbo (Dungeness)'
"	10	15	4200 ' ditto (Cont) '
"	11	9	2660 'Pipelines to the battlefields'
"	12	10	2940 'Conclusions'
		<u>47,350</u>	

Synopsis:

Operation Pluto traces the story of this imaginative and brilliantly executed idea from the the original fuel requirements stated by the planners of Overlord to the final pumping of the fuel from the Mersey and Avonmouth direct to the armies of the Rhine.

The planners estimated a demand for 2,000 tons of fuel a day in the early stages of the assault increasing to 7,000 tons a day when all the forces were deployed. In the event this figure was almost doubled. The main concern was the vulnerabiliyuof tankers and ships loaded with cased fuel to air attack and the fact that it almost certainly would not be possible to use harbours until cleared of wreckage and mines.

Combined Operations HQ was charged with the duty of finding

a suitable method of complying with these demands and quickly ruled out an original proposal that petrol in these quantities should be transported in the standard 4 gallon tins owing to their tendency to leak with its attendant dangers. Ship to shore pipelines were the subject of experiments and trials and proved successful on sandy beaches. The jerrycan was considered to be the best container for use in action and a method of providing bulk supplies was sought. The problem was put to *Geoffrey Lloyd by Admiral Mountbatten who asked for an oil pipeline across the Channel. Oil experts were consulted and most were of the opinion that it could not be done under war conditions. But A.C.H. Hartley, Chief Engineer of Anglo-Iranian suggested using a large deep-sea cable containing a lead pipe and trials by Siemens and Post Office cable ships proved it practicable. Siemens Bros. of Woolwich had many years of experience in manufacturing and laying deep sea cables and did all the original experimental work on the HAIS cable as it was code named and initiated a number of modifications. One of the most important steps was the production of a coupling to join lengths of cable together and capable of passing round the drum of a cable ship. The internal lead pipe also underwent modifications and eventually a seamless extrusion was produced by other cable manufacturers.

A 1,500 ton coaster was converted for cable laying and took on board a 30 mile length of 2 inch HAIS cable. This was used in a full scale trial from Swansea to Watermouth in Devon. Pumping started at 750 psi and was increased to 1500 psi. After a test with water, petrol was pumped from the Llandarcy refinery at the rate of 56,000 gallons per day to Watermouth where it was distributed by tankers to normal outlets.

The original requirement had been for lines to be laid

(3)

across the Dover Strait but this was later altered to the Isle of Wight to Cherbourg, roughly treble the distance. This produced a number of problems. The amount of HAIS cable required increased similarly and this was well beyond the capacity of Siemens so a number of other cable manufacturers were brought in, including some in America. The available cable-laying ships could not carry the lengths necessary and others had to be designed and converted. Even when pumping at very high pressures the line friction reduced the flow considerably so that the throughput of a 2in HAIS over the 65 miles to Cherbourg would be very small. Siemens were requested to produce a 3in pipe and this proving successful the 2in was then abandoned in its favour.

As a back-up for the HAIS cable an entirely novel idea for a cross-Channel pipeline was proposed by two very experienced oil men B.J.Ellis and H.A.Hammick. In the oil fields they had noted that long lengths of small diameter steel pipe were remarkably flexible. As a result experiments were carried out by Stewarts and Lloyds of Corby and it was found that 3in ID mild steel pipe could be coiled round a drum 45 feet in diameter. Ellis suggested that for laying the pipe the drums must float on their own and be towed by tugs. Much to the surprise of most of those engaged in the Pluto project tank trials proved that the idea was practicable. Eventually six enormous drums, 52 feet in diameter to the flanges and 90 feet long were built and loaded with 90 mile of HAMEL pipe as it was code named. At Tilbury in Essex two stacking and welding plants were built with special decks with gantrys to hold the Conundrums as they were code-named while the pipe was wound on. There were 14,000 welds in each eighty mile length of HAMEL pipe.

Both systems having passed their initial tests the ways and

(4)

Having decided that both the HAIS and HAMEL pipelines would work it became necessary to examine the means of laying them across the Channel. The increased distance now proposed meant that all original estimates were now superseded. Advised by the Post Office cable ships section the Director of Naval Construction gave the problem to the Royal College of Naval Constructors who quickly and efficiently designed the fleet required. This ranged from the converted hopper barge which laid the first HAMEL lines to the massive Conundrums and a number of merchant ships which were fitted with cable laying gear capable of handling the large HAIS cable which weighed 65 tons to the mile. In addition there were numerous unusual craft required for the ship-to-shore pipelines (code name 'Tombola'), handling the shore end connections, accommodation vessels and many more. Connecting up with the shore at the end of both HAIS and HAMEL lays was never easy and gave trouble right to the end. Chapter Five gives full details of the work of DNC.

The Admiralty then became involved in manning this rather motley fleet and appointed Captain J.H. Hutchings, a retired submariner, as Senior Naval Officer and more or less told him to get on with it. As by this time it was well into 1943 time was a major factor. But Hutchings dived into the task with an enthusiasm which soon became almost an obsession. A religious man he was convinced that Pluto was going to be the key to success in 'Overlord' and that the Lord was on his side. With the invasion within sight manpower had already become a problem so the requirements of Pluto were very unpopular. But the men were found somehow with Hutchings treading on a few toes in the process.

Then of course training had to begin as soon as possible. This consisted of Tombola trials with the Royal Engineers, HAMEL trials with HMS 'Persephone', the converted hopper

(4)

barge and a highly concentrated spell of training in HMS 'Latimer', a HAIS cable layer, on the Clyde. Under the direction of Commander Treby Heale a very experienced cable ship captain every possible type of operation which might have to be carried out in earnest was demonstrated and tried. Only five miles of HAIS had been allocated for this work and this was laid, picked up and laid again several times. This was a mere four months before the landings took place.

Meanwhile training of the units (RASC AND RE) which were going to handle the shore ends of the lays was going ahead at the Llandarcy refinery and elsewhere. Men with only slight experience of the oil industry were roped in and anyone with some practical engineering knowledge asked to volunteer - perhaps with a little persuasion. The trials - of the tribulation variety - encountered during the training would make a book on their own. Hutchings seemed to thrive on it.

As D-day approached it became clear that a number of those in high places were less than happy with Pluto. Possibly because intelligence had shown that the Luftwaffe was too involved on the Russian front to prove the threat to tankers that had been expected. Admiral Ramsey, Naval Commander Expeditionary Force, is reported to have called Pluto his biggest headache and said he could make better use of the ships and men. But even at the last moment the Germans might have switched enough planes to have proved a serious menace. Without the fuel the Allied armies could not have advanced.

D-day came and Hutchings reported Force Pluto ready for action. Tombola was due to commence work on D+10 and as soon as Port-en-Bessin was reported clear Hutchings led his team into action. Unfortunately the beach off the port had rocky

(6)

outcrops and hauling the 6 in pipes out to the tanker moorings was not as easy as it had proved on the beach at Westward Ho! A fleet of coastal tankers manned by splendid crews of volunteers were loaded and ready and were soon forcing their way into the little harbour of P-en-B and unloading at speed. Returning to the Hamble they re-loaded and repeated the drill. In their enthusiasm a good deal of bumping and boring went on and at one time nearly a third of the fleet was undergoing repairs.

At Cherbourg there was little but frustration for Hutchings. The Americans who were clearing the harbour of wrecks and mines did not appear to want Pluto and with his superiors dragging their heels it almost looked as if Pluto would be a non-starter. Due to start the first lay on D+8 it was D+63 before Hutchings got the go-ahead.

Two Hais lines were laid from Cherbourg to Sandown Bay in fourteen hours in each case only to be damaged by attendant craft at the end of the lay. The first line was soon closed down as useless; the second was more successful and petrol was pumped at 750psi over the 65 miles to Cherbourg for about a week when pumping pressure was increased to 1,000 psi after which the line soon failed. Both failures apparently due to damage after laying.

HAMEL was if anything less successful. The first attempt led to all sorts of difficulties, possibly due to tidal conditions. For the first few miles the first HAMEL lay proceeded smoothly until suddenly with a loud crack the steel pipe parted. Subsequent examination of the end left of the Conundrum proved this was due to a faulty weld - the only one found out of the many thousands made. The second HAMEL lay went off

(7)

without a hitch but the line later developed faults. As by now the Allies were in command of the whole of the Channel coastline Pluto moved to Dungeness for Operation Dumbo. This proved much more successful in spite of the fact that the weather deteriorated steadily and working off the beaches was often hazardous Dungeness in particular being usually a lee shore. Times of leaving Dungeness and arriving at Boulogne had to be timed accurately in order to have water over a shoal and also to be able to slip the end of the pipeline off Boulogne within a margin of 50 to 100 yards. Navigation generally had to be extremely precise. The HAIS cable ships did not suffer anything like the difficulties that the unwieldy Conundrums did ~~but~~ thanks to the skill of the tug skippers and barge crews only one Conundrum was lost. This was due to a combination of gale force winds, wires parting and general mayhem.

Ten HAIS lines and seven HAMEL lines were laid successfully with varying ease or difficulty but it was 10 October before the first HAIS line was laid from Dungeness to Boulogne delivering about 450 tons of petrol a day. Ostend had been captured and the first tanker discharged in the port on 29 September.

But Pluto went ahead, weather permitting, there being gales with snow showers interspersed with thick fog. The story of Operation Dumbo is a fascinating record of splendid seamanship and dogged determination on the part of the members of Force Pluto.

On 1 June 1945, 24 days after the official end of the war in Europe the Pluto weekly report stated that of the 17 lines laid 11 were functioning at full efficiency and 21,003 tons of fuel had been pumped across the channel the previous

week Pluto having achieved a throughput of a million gallons a day. 800 miles of new and difficult cable and pipelaying had been carried out with the loss of one Conundrum and without losing a single man. In fact the enemy appeared to have ignored Pluto entirely. Perhaps they did not think it would work.

The work of the army in laying the pipelines on shore has not been given in detail but there is a general description of the undertaking. 6 inch pipes with victaulic joints were used with storage and pumping stations at intervals. Details of the pumps used and pressures required are given. The fuel originated from Stanlow, Avonmouth, Shellhaven and the Isle of Grain. The army contributed a number of stories, most of them humorous about sabotage or 'borrowing' by the black market from the pipelines and inadvertant damage by our own mortar bombs.

The final chapter offers conclusions as to the need and value of Pluto and its contribution to Overlord. The difficulties experienced in linking up the shore ends is discussed. It is mentioned that the Americans had a plan to manufacture six mile lengths of 6 inch pipe across the Channel using grasshopper joints to connect them. It was abandoned in favour of Pluto.

Finally it cannot be said that Pluto made a major contribution to the success of Overlord. Not because the system failed but because due to the virtual absence of the Luftwaffe tankers were able to go about their business unmolested. As far as is known not one was lost.