WET CLEANING

BY

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When the Author was a Lieutenant (E) and Engineering Mechanics were Stokers, then bilges, boilers and fuel tanks were all things that had to be cleaned by the Engine Room Department. Usually this had to be done at the moment that the First Lieutenant had wangled a few days extra leave for the ships company. In later years, rumour had it that there were such things as Tank Cleaning Vessels. Such craft had never been within a mile of any of the Author's ships, and he therefore remained ignorant and slightly sceptical about what they were supposed to do.

This state of affairs changed one day when instructions were received that tank cleaning vessels were to be taken over by the Captain of the Dockyard, and were no longer to be operated by the Royal Navy.

It was quite straightforward to commission another yard craft vessel with a complement of officers, seamen and stokers. The ratings in yard craft begin either as seamen or stokers, and the latter have not changed their name, because they still shovel coal from time to time in the more senior tugs. The problem of the men in the tank cleaning party was not so simple. They were obviously neither seamen nor stokers and therefore had to be classed as labourers ; and, what is more important, they had to be paid as labourers. (Later on it was approved that they should be rated skilled labourers, which meant a pay increase of a few shillings a week). Consultation with the regulations showed that the pay of a labourer was slightly under £8 per week, but he could earn an extra £1 per week for working in exceptionally obnoxious conditions. It was evident that men would not volunteer to take on the unpleasant task of tank cleaning for £9 per week.

One way to increase their pay would be to work a considerable amount of overtime, but this would be unpopular with the seamen and stokers who are paid on a special yard craft agreement ; they would have to work longer hours without getting an appreciable amount of extra money. It was also evident that 44 hours a week would be somewhere near the limit of physical endurance if the cleaners worked really hard. It was therefore decided to increase the pay packets of the tank cleaners by working ' job price contracts '. Devonport were able to take advantage of being the last southern yard to operate a T.C.V., and it was therefore possible to get many useful tips from Chatham and Portsmouth.

It is probable that many readers will know more about job price contracts than the Author, but for the benefit of those who do not, it is necessary to explain that a fixed sum of money is given for a formal contract to do so much work. The sum is fixed by the management, and must be acceptable to the men. The sum of money offered is based upon the estimated time for the job. If the men finish exactly in the time estimated, they receive the money in addition to their ordinary wage. (It is not really quite as simple as this, but the explanation must be kept brief, and this article must be kept to the subject under discussion). If the men finish before the estimated time, they get the sum of money laid down in the contract, but they are free to start immediately on another contract ; this results in a fatter weekly packet. If they fail to finish on time they cannot take on another contract until they do finish, and their weekly pay packet is therefore leaner.

The operation of a tank cleaning vessel can, consequently, be regarded as a reasonably sporting gamble. It requires a fair amount of trust and good under-

standing between both parties to the contract if it is to be successful. Before a ship is cleaned, an impartial ' runner ', who does not share in the contract, is sent to the ship to find out what is required. The T.C.V. Engineer and the men's representative sum up the information supplied by the ' runner ' and a contract is then typed and signed for a fixed sum of money. At Devonport, the contract is then passed to the Engineer Officer on the Staff of the Captain of the Dockyard ; he scrutinizes the price and the conditions of the contract before signing. The contract is finally passed to the Expense Accounts Officer but is not closed until the ' customer's ' Engineer Officer signs that he is satisfied with the work that has been done on his ship.

To work the system effectively it is essential that each contract is precise, agreeable to all concerned, and lodged with the Expense Accounts Officer before work starts. It is also necessary that the contract can be closed within a few days of work being started, otherwise the men won't get their money for this contract in their pay packets. It is the practice at Devonport to make out at least one and often two contracts for the cleaning of a small ship. For an aircraft carrier, contracts are made out for perhaps three or four tanks or a pair of bilges. The contract is based upon the times given in A.F.O. 515/57 plus a little extra time for rigging and unrigging hoses ; a further allowance is made if the tanks are known to contain heavy sludge.

T.C.V. *Switha* at Devonport got off to a good start and was greatly helped by two key naval ratings who stayed on in the vessel for the first month of the civilian commission. At first, work was only on oil fuel tanks but soon bilges were included. Later an aircraft carrier required several of her Avcat tanks to be cleaned.

It was not long before it became clear that there were two or three points that needed close watching if the T.C.V. was to be successful. The first point was the importance of getting a full order book for at least six weeks ahead, otherwise the tank cleaning party dropped about 40 per cent of their pay on any day that the vessel did not clean tanks. It was therefore considered necessary to press forward with water washing boilers. Fortunately an approved A. and A. came out at this time authorizing the necessary extra fittings for water washing and the *Switha* was laid off for a few days to enable the dockyard to do the necessary work.

The first boiler to be washed was in a *Daring* Class destroyer. To a person who had never before seen a boiler washed the results were remarkable. The tubes looked like new, and their original coating of thin zinc was visible. The aluminium funnel gleamed in the light of a wandering lead. The task was easier than had been expected, and conditions were far more agreeable than those experienced when working in double-bottom tanks. A little experimental work with various nozzles on the upper deck showed that it was an advantage to have larger hoses and bigger holes in the lances than were provided in the store pattern articles ; the T.C.V. having no need to limit the amount of water that she uses. The tank cleaning party preferred to use their tank cleaning jets as much as possible because a good solid jet of liquid seemed to have a better scouring effect than any type of diffused spray. It was found comfortable to work with water up to 180 degrees F. ; above this the nozzle became too hot to hold. The pressure of 150 lb/sq in, which is normal for the T.C.V. pumps, seemed to be about right. It was found that each boiler needed about five tons of water to wash it.

It was easier to wash the boiler if all the bottom casings were removed to allow the water to flow freely into the bilge. The water in the bilge was sucked back into the T.C.V. It was evident that this procedure partially cleaned the bilges and that very little extra time was needed to make a ' proper job ' of it whenever the boiler was being washed.

The ship's staff were required to remove the casings and seal the brickwork the day before work was due to start. They also accept each portion of the boiler before the cleaners move on to the next. After the cleaners have finished, the ships company replace the casings and flash up the boiler.

The procedure for recovering the liquid used for washing boilers or bilges varies slightly in each of the Home Dockyards ; a meeting was recently held by E.-in-C. in order to determine which method was the best. At Devonport, it is the practice to recover all the liquid used for washing boilers, bilges or tanks. It is passed through the T.C.V. vacuum and settling tanks and is then used again. More Teepol is added whenever the tank cleaners decide that the mixture is too weak. There is no short, simple and scientific method known to the Author of determining the exact amount of Teepol present, but it should be about 2 per cent. The oil is taken off in the settling tanks and burnt in the furnace of the T.C.V. boilers. The other substance recovered is sludge. This too well known compound is probably a mixture of fuel oil, lubricating oil, soot, paint, evaporator scale and perhaps a little sand. There may well be other even more unattractive constituents but the matter has not been investigated very fully because the sludge is given to S.N.S.O., and becomes diluted by the other liquids in the sullage barges and is no longer the concern of the Captain's Department.

The first boiler to be washed was subjected to a mixture of water and Teepol, but a few discreet enquiries among members of the Scientific Service made it clear that Teepol was not the best thing to use because it could contain salt. The amount of salt in Teepol and water could not readily be measured, but it was certain that salt was good for neither boiler tubes nor boiler bricks. Further enquiries still failed to find anyone except the tank cleaners who thought Teepol ought to be used for washing boilers. It was known that the Fleet had been using pure water for several years, and were getting good results.

It was, therefore, considered advisable that T.C.V. *Switha* should use the soft local water in future. Local shore water is used in the water-tube boilers of Devonport yard craft, and it was known to need very little chemical treatment to maintain it within the limits considered by I.C.I. to be suitable for water-tube boilers. The water used for washing boilers is now drawn from shore and kept in a special tank. From the tank it is heated and discharged against the boiler tubes. It is recovered by the T.C.V., passed round her tanks, and is used for tank washing, but never again does this water get near a boiler tube.

Another job for which the T.C.V. proved suitable was to clean the bilges, internal fuel tanks and the lubricating oil tanks of a submarine. The whole task took about two days. There is every reason to believe that Devonport was not the first yard to clean submarines. Some of the fuel tanks in our first customer were very awkward, and it was generally agreed that the smallest man in the cleaning party had done far more than his normal share of the work, while cleaning this submarine.

The tank cleaning vessel has now become popular with other dockyard departments at Devonport because it is realized that it is far better to work in machinery spaces that are clean and dry. Perhaps the day is not far off when clean bilges will have to be guaranteed by the ships' officers before a ship is allowed to pass into dockyard hands.

A problem that needs unrelaxing attention is the T.C.V. programme. This programme has to be frequently rearranged, and is usually full of minor amendments within a week of being typed. One carefully planned programme became out of date during the three hours that it lay in the office awaiting its turn to go on the typewriter. The full two-months warning, as required by A.F.O.2974/56, is very necessary, and late requests cause the maximum trouble.

On receipt of a request for a T.C.V., it is necessary to consult the Planning Department of the yard in order to see what other ships are likely to be in at that time, and also to check that the ship making the application is planned to be in the refit programme. If she is in the refit programme her docking date is checked ; if she is not in the programme the ship will get far less weight given to her requirements but, so far, no applications have had to be entirely refused. If no other ship has an overriding claim to the T.C.V. during the period, the customer is put down in the T.C.V. programme and a reply is made to her signal.

About a fortnight before the ship is due at Devonport, it is necessary to consult the Movement Officer and work out with him if it is possible for the ship to be in an outside berth with a clear side on the day selected for her to be cleaned. These arrangements are liable to drastic alteration if there is a strong wind or some of the many other reasons crop up to alter the movement of one big ship. A big ship movement requires most of the tugs and riggers, so these are not available to move several small ships at the same slack-water period.

At Devonport, it is always preferable to clean a ship while she is in tidal water because the T.C.V. is then free to move on to the next job as soon as the present one is completed. If it is essential to bring the T.C.V. into a non-tidal basin, there is only one time each day when this can be done, and on certain days the basins are not opened.

It takes about an hour to move from one ship to another in tidal waters if one counts the time lost from the moment the last hose is inboard until the moment when the first hose goes out again. It takes nearly three hours to get to a ship in a basin. The total wage bill, exclusive of overhead and fuel costs, is about £8 per hour so that it costs an extra £16 to move in and out of a basin. If the basin opens in the afternoon there is often insufficient time remaining to make it worth while to start cleaning on the same day, so the cost may increase even more for a basin movement.

When a ship arrives at Devonport it is usual for ' the runner ' from the T.C.V. to go onboard. If this does not happen within a few days it is as well for the ship to send a petty officer to the T.C.V. to get the necessary information concerning the date that the T.C.V. will come alongside. The programme is very likely to change more abruptly for ships about due for cleaning than it will for those whose turn is not for another month. Ships should be prepared for the T.C.V. to arrive a day earlier than expected or occasionally a day later. The T.C.V. may want to work on till 2000 some nights especially if water washing boilers, because this takes more than eight hours and is a job that must be completed on the same day that work starts.

It is perhaps as well to point out that the real task of a T.C.V. is to degrease rather than to clean ships, and there are certain tasks for which it is uneconomical to use a T.C.V. Cursed by all tank cleaners will be the ship that orders a T.C.V. when she should have ordered a sullage lighter. If the T.C.V. has to take in an excessive quantity of water or fuel she will have to discharge the liquid into a lighter. While sucking out liquids from a ship the tank cleaners are mostly idle and unable to start the work they have contracted to do. Only one or two men are required to tend the suction hoses while emptying a vessel of liquid. To the tank cleaners, pumping out a vessel means loss of money, and to the management it means that the T.C.V. is liable to get astern of her schedule and may have to work overtime in order to catch up.

Cursed also is the ship that orders a T.C.V. when she should have asked for a mechanical excavator. Occasionally complaints have been received that certain bilges have not been cleaned properly because they still had several

inches of evaporator scale in them. It is fair to say that if the scale is no longer geasy then the T.C.V. has carried out her part of the bargain. If a nut or a bolt or a chunk of evaporator scale is sucked back by the T.C.V. hose it will lodge in the filters. It will consequently be necessary to clean the filters periodically. The contents of the filters have to be carried across the T.C.V. and the ship being cleaned until they can be dumped in the nearest available gash compound. Bilges with excess solids can cause the filters to need cleaning several times each hour instead of once a day. There is nobody available for frequent filter cleaning except the chief stoker. This is because the stokers in a T.C.V. work eight-hour watches with only one relief for the whole department. The relief makes it possible for the stokers to get their meals one at a time. When off watch the extra stoker is expected to clean filters and do all the odd jobs that need doing.

It is known that when H.M.S. *Switha* was operated by the Royal Navy, she did excellent work and had a great many signals thanking her for services rendered, but before the summer of 1956 there were many more ships being refitted by contractors, and these all had to be cleaned before they left their home ports. It was also necessary for the naval ships companies to have leave three times a year, so it is probable that the services of the T.C.V. were not always available at the time they were required by ships of the Fleet. Whether this was the reason or not, it did seem to the Author that, when T.C.V. *Switha* started work in December, 1956, there was some reluctance on the part of certain small ships to make full use of the services offered. This reluctance is believed to be no longer evident, and ships of the Fleet now provide the majority of the work. Work is welcomed because it means extra money to the tank cleaners and the management have no desire to have the T.C.V. idle but costing over £60 a day in wages. Bilges that are cleaned at regular intervals can be cleaned again far quicker than those that have the rust and dirt of years in the corners. The contract price does not usually make any allowance for the state of the bilges to be cleaned, the tank cleaners, therefore, make the most profit when working on regular customers.

In conclusion, it is perhaps as well to offer some quotations for the benefit of new customers. The times quoted are in days, but these days can be anything from eight to twelve working hours. It is only by frequent adjustment to the length of the working days that it is possible to keep anywhere near the dates shown on the programme.

Battle Class Destroyer	Clean all bilges—one day. Clean all tanks—three days. Water wash both boilers and clean boiler bilges—one day.
'Algerine' Class Minesweeper	Clean all bilges—one day. Clean all tanks—one day. Water wash both boilers and clean boiler bilges—one day.
'T' Class Submarine	Clean bilges and lubricating oil tanks—one day. Clean all internal fuel tanks—one day.

New customers are welcomed.
Regular customers are welcomed with a smile.