

CHAPTER 24

FUELING BILL
(PLATE XX)

24-1 GENERAL:-

The conditions of war present many problems in connection with the fueling of vessels. The Fueling Bill sets up the procedure to be followed and assigns the necessary personnel for fueling under all conditions that may arise.

24-2 CONDITIONS OF FUELING:-

The following conditions of fueling are considered:

- (a) Fueling at dock.
- (b) Fueling from barge, tanker or another vessel in port.
- (c) Fueling from tanker or another vessel at sea.
- (d) Fueling a shore station.
- (e) Fueling another vessel in port.
- (f) Fueling another vessel at sea.

24-3 DIESEL OIL FILLING CONNECTIONS:-

The Diesel oil storage tanks are filled through 2-1/2" deck filling connections fitted with caps and chains. TABLE 24-1 shows the location of these filling connections, their control valves and the fuel oil tanks they serve.

TABLE 24-1

DIESEL OIL FILLING CONNECTIONS

LOCATION OF CONN.				D.O. FILLING CAP			D.O. TANKS & 95% (GALS.) CAPS.
CONN. NO.	P/S	FRAME	DECK	INSCRIPTION	P/S	FRAME	
0	P	13-14	Super.	D.O. Filling A-902F	P	13-14	A-902F 4751
1	S	13-14	Super.	D.O. Filling A-903F	S	13-14	A-903F 4530

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TABLE 24-1 (cont'd.)

24-3

DIESEL OIL FILLING CONNECTIONS

CONN. NO.	LOCATION OF CONN.			D.O. FILLING CAP			D.O. TANKS & 95% (GALS.) CAPS.
	P/S	FRAME	DECK	INSCRIPTION	P/S	FRAME	
2	P	13-14	Super.	D.O. Filling A-904F	P	13-14	A-904F 4530
3	S	15-16	Super.	D.O. Filling A-905F	S	15-16	A-905F 5014
4	P	15-16	Super.	D.O. Filling A-906F	P	15-16	A-906F 5105
5	S	15-16	Super.	D.O. Filling A-907F	S	15-16	A-907F 5105
6	P	17-18	Super.	D.O. Filling A-908F	P	17-18	A-908F 1727
7	S	19-20	Super.	D.O. Filling A-909F	S	19-20	A-909F 3408
8	P	17-18	Super.	D.O. Filling A-910F	P	17-18	A-910F 3408
9	S	27-28	Super.	D.O. Filling C-203F	S	27-28	C-203F 9135
*10	P	20	Super.	D.O. Deck Filling	P	19-20	See Note -

* This is a 2" cut-out valve for deck filling and discharge line terminating with 1-1/2" hose connection for motor-boat servicing. Fuel oil transfer by portable submersible pump of LSM tanks shall be made through same connection.

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24-4 LUBRICATING OIL FILLING CONNECTIONS:-

The lubricating oil storage tanks are filled through 2" deck filling connections fitted with caps and chains. TABLE 24-2 shows the location of these filling connections, their control valves and the lubricating oil tanks they serve.

TABLE 24-2

LUBRICATING OIL FILLING CONNECTIONS

CONN. NO.	LOCATION OF CONN.			L.O. FILLING PLATE			L.O. TANKS & 95% (GALS.) CAPS.
	P/S	FRAME	DECK	INSCRIPTION	P/S	FRAME	
*1	S	20-21	Super.	L.O. Fill. & Disch. to Deck	S	20-21	A-213Lub. 1934
*2	P	19-20	Super.	L.O. Fill. & Disch. to Deck	P	19-20	A-215Lub. 685

* These same connections are also used when discharging.

24-5 DIESEL OIL STORAGE TANKS SOUNDING TUBES:-

The Diesel oil storage tanks are fitted with 1-1/2" sounding tubes. A Sounding cap is fitted to the top of each pipe. TABLE 24-3 shows the location of these sounding tubes.

TABLE 24-3

DIESEL OIL STORAGE TANKS SOUNDING TUBES

TUBE NO.	LOCATION OF TUBE			SOUNDING TUBE PLATE			D.O. TANK
	P/S	FRAME	DECK	INSCRIPTION	P/S	FRAME	
0	P	11-12	Tank Well	Sounding A-902F	P	11-12	A-902F*

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TABLE 24-3 (cont'd.)

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DIESEL OIL STORAGE TANKS SOUNDING TUBES

TUBE NO.	LOCATION OF TUBE			SOUNDING TUBE PLATE			D.O. TANK
	P/S	FRAME	DECK	INSCRIPTION	P/S	FRAME	
1	S	11-12	Tank Well	Sounding A-903F	S	11-12	A-903F**
2	P	11-12	Tank Well	Sounding A-904F	P	11-12	A-904F**
3	S	14-15	Main A-103L	Sounding A-905F	S	14-15	A-905F**
4	P	14-15	Tank Well	Sounding A-906F	P	14-15	A-906F**
5	S	14-15	Tank Well	Sounding A-907F	S	14-15	A-907F**
6	P	17-18	Tank Well	Sounding A-908F	P	17-18	A-908F**
7	S	17-18	Tank Well	Sounding A-909F	S	17-18	A-909F**
8	P	17-18	Tank Well	Sounding A-910F	P	17-18	A-910F**
9	P	27-28	Tank Well	Sounding C-203F	P	27-28	C-203F**

* Diesel oil tank capacities are given in TABLE 24-1.

24-6 LUBRICATING OIL STORAGE TANKS SOUNDING TUBES:-

The lubricating oil storage tanks are sounded by means of trycock level indicators which are connected with hand pump and sight flow which in turn is provided with a return pipe. This arrangement is located on the forward engine room bulkhead, starboard side.

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24-6 LUBRICATING OIL STORAGE TANKS SOUNDING TUBES:-

These tanks, A-213Lub. and A-215Lub., are provided with individual, combination overflow and air escape lines terminating on the starboard bulkhead of the Tank Well Deck, between frames 18 and 19.

24-7 PUMPING EQUIPMENT:-

The arrangement of the piping and valves of the Diesel oil system is such as to permit pumping Diesel oil from the vessel's tanks to another vessel or shore station. Flexible fueling hose is provided for fitting to the 2" filling and discharge connection, indicated as connection No. 10 in TABLE 24-1.

The pumping power is furnished by the temporary connection of a hose on the discharge side of ballast pump. This arrangement consists of a blind flange with connection for the hose.

24-8 FUELING PROCEDURE - GENERAL:-

(a) The Executive Officer (First Lieutenant) will be in general charge of fueling operations in so far as seamanship is concerned. He will be responsible for:

- (1) The handling of all lines and tackle.
- (2) The placing of fenders.
- (3) Putting chafing gear on fuel hoses as necessary.
- (4) That the draft of the ship is taken before and after fueling and reported to the Officer of the Deck.

See C&R Manual, Article 1421; BuShips Manual, Chapter 55.

(b) The Engineering Officer will be in charge of the actual fueling operations in so far as concerns the following:

- (1) That the instructions contained in Navy Regulations, Manual of Engineering Instructions, and all other orders issued by competent authority are complied with.

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FUELING PROCEDURE - GENERAL:-

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(b) (cont'd.)

- (2) That all safety precautions coming under the Engineering Department are rigidly enforced.
- (3) That all oil tanks, prior to fueling, are trimmed in such a manner as to permit fueling rapidly.
- (4) That soundings of tanks and tests of fuel are carefully made.
- (5) That the Officer of the Deck is kept informed of the progress of fueling; the times of starting and completion and the amount of fuel taken or discharged.
- (6) The Engineering force will connect and disconnect the fueling hose.

See MEI, Article 5-135; C&R Manual, Article 1421, BuShips Manual, Chapter 55.

(c) The Officer of the Deck is responsible for the enforcement of safety measures which principally concern the deck force and the ship as a whole. It is his duty to see that the following measures are complied with:

- (1) That smoking lamp is out.
- (2) That no naked lights are within 50 feet of fueling hoses or oil tank vents.
- (3) That powder flag is hoisted.
- (4) That high frequency radio is secured.
- (5) That all electrical appliances and machinery likely to spark that are within 50 feet of fueling hoses or oil tanks vents are secured.
- (6) That draft of ship before and after fueling is entered in the log.
- (7) That the time of starting and completion of fueling and the amount of fuel taken or discharged are entered in the log.
- (8) That a watch is maintained on all open man-holes.

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24-9 FUELING IN PORT:-

Fueling in port requires consideration of the following conditions, any of which may become necessary:-

- (a) Fueling at a dock.
- (b) Fueling from a barge, tanker or another vessel.
- (c) Fueling a shore station.
- (d) Fueling another vessel.

The fueling operation in port offers no particular problem and with minor exceptions as noted, is substantially the same for all the conditions listed above.

The handling of lines and fueling operations will be done in the same manner and by the same details as given in TABLE 24-4 following.

The fueling hose will be connected and disconnected by the engineering force.

24-10 FUELING AT SEA - GENERAL:-

Naval operations, under the present conditions of war, frequently make necessary, the fueling of ships at sea and often under the most difficult circumstances.

Instances have occurred where fueling has been accomplished at night, during darkened ship, at fifteen knots and zig-zagging.

Under the best conditions, fueling at sea calls for cool-headedness, first class seamanship and the cooperation and coordination of all hands concerned.

Only two lines are used in fueling at sea, the tow line and the spring line.

Where the fueling ship has no boom to handle the fueling hose, a third line is necessary to support the hose.

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24-10 FUELING AT SEA - GENERAL:-

The tow line is almost always set at a predetermined length and should need little or no tending.

The spring line is always tended on the fueling ship. The purpose of this line is to prevent the head of the vessel being fueled from taking an erratic swing away from the fueling vessel and swinging her stern against the side of the fueling vessel.

The tow line should be passed first with the spring line always under the tow line.

Normally, the distance between the sides of the fueling vessels is between twenty and fifty feet depending upon conditions at the time of fueling.

The location of fenders along the side is important in case the two vessels come together as often happens; two portable fenders should also be ready for use.

All lines are normally furnished by the fueling ship.

24-11 LSM FUELING AT SEA FROM TANKER:-

(a) PREPARATIONS ON FUELING SHIP

- (1) Fueling Details man their stations.
- (2) Break down the life lines on the fueling side; rig temporary lines inboard if necessary.
- (3) Rig 70 fathoms of 6" or 8" manila, through most forward chock on fueling side for towing line. Bring back along outside of rail so that 90 feet is available as towing line; stop off along rail. Attach 25 fathoms of 3" or 4" manila messenger below eye of towing line. Attach 2" or 2-1/2" manila messenger with heaving line to the 4" messenger and have ready for passing to the LSM.

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24-11 LSM FUELING AT SEA FROM TANKER:-

(a) (cont'd.)

- (4) Rig 25 fathoms of 6" manila through chock next to the most forward on fueling side for breast line.
- (5) Rig give cane fenders along the fueling side, spaced at equal intervals and about halfway between the waterline and the main deck. Have three small portable fenders ready for use on the fueling side.
- (6) Rig fueling hose with saddles. Attach quick releasing coupling to end of hose. Rig 25 fathoms of 4" manila secured 20 feet from outboard end of hose with a clove hitch; stop off at three foot intervals to bitter end of hose. This line should be clove hitched at about its center so that it can be tended on the fueling ship as well as the ship to be fueled. Attach 25 fathoms of 2-1/2" manila messenger with heaving line to 4" manila hose line. The inboard end of the 4" manila is lead through a snatch block at the boom head and back down to a cleat on the opposite side of the ship. As the ship to be fueled hauls in on the fueling hose this line is paid out.
- (7) The first outboard hose saddle should be rigged at the center of the second length of hose. The second saddle should be rigged at about the center of the entire length of fuel hose.
- (8) Rig 20 fathoms of 5" manila secured to the outboard hose saddle and rove through a snatch block near head of boom and back down to the deck through a fair lead block to the nigger head of the winch. Rig 3/4 inch wire whip, lead through a fair lead block on the boom to the inboard saddle.
- (9) Seize a small bag containing nuts, bolts, gaskets, etc., to the 2-1/2" manila messenger on the fuel hose.

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24-11 LSM FUELING AT SEA FROM TANKER:-

(a) (cont'd.)

- (10) Rig distance line marked off at one foot intervals.
- (11) Rig 25 fathoms of 2-1/2" line rove through a snatch block located at a high point for sending over a telephone line to the ship to be fueled.
- (12) Have line throwing guns and heaving lines ready on forecastle and at fueling stations.

(b) PREPARATIONS ON LSM

- (1) Fueling Details man their stations.
- (2) Break down the life lines on the fueling side; rig temporary lines inboard if necessary.
- (3) Have tools, tackle and straps available and ready as required.

(c) FUELING OPERATION

- (1) Fueling ship stands steady on predetermined course at speed of 8 knots. Hoists "ABLE" on side chosen for fueling, when everything is in readiness.
- (2) The LSM will take station 200 to 300 yards on the fueling quarter of fueling ship and checks course and speed. Hoists "ABLE" at dip when everything is in readiness.
- (3) When starting the approach, the LSM will two-block "ABLE", increases speed slowly so as to come up parallel to the fueling ship with about 80 feet distance between sides of the ships. Avoid being caught in the screw suction of fueling ship during the approach. Be at fueling speed when slightly ahead of fueling position.
- (4) Fueling hose positions will be marked by red flags on fueling and fueled ships.

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24-11 LSM FUELING AT SEA FROM TANKER:-

(c) (cont'd.)

- (5) The LSM adjusts speed so as to take up her final fueling position. This position will usually be when the bridges of the two vessels are directly abreast of each other. In any case, whatever the predetermined final position of the LSM is it should be closely maintained throughout the fueling operation.
- (6) When the LSM has gotten into position, the fueling ship will pass the 6" or 8" towing line. The LSM takes this towing line through the chock at frame 12 on the fueling side. When secured, the towing line is tended on the fueling ship to assist the LSM in maintaining the proper distance. The LSM should maintain station with small course and speed changes.
- (7) Fueling ship passes fueling hose, tending bight of hose with whips from boom near fueling station. LSM attaches hose to fueling line.
- (8) Fueling ship passes telephone line and distance line.

24-12 LSM FUELING ANOTHER VESSEL AT SEA:-

When the LSM fuels another vessel at sea, the same procedure is followed, with exceptions as noted below, as given in paragraph 24-11, except that the LSM is now the fueling ship.

As the LSM has no boom, the fuel hose to the ship being fueled must be entirely supported by the fuel hose messenger. Also the LSM is only able to pump and discharge fuel to another vessel through the 4" hose connection on discharge side of ballast pump.

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24-13 FUELING STATION ASSIGNMENTS:-

The assignment of stations for fueling will be in accordance with TABLE 24-4 below. It is to be noted that the forward fueling detail is assigned to the Diesel oil tanks as given in TABLE 24-5 which follows. The after fueling detail is assigned to the Diesel oil tanks and the Lubricating oil tanks given in TABLE 24-6 which follows.

TABLE 24-4

FUELING STATION ASSIGNMENTS

DIVISION	RANK OR RATE	STATION	DUTIES
<u>OFFICERS</u>			
Commanding Officer		Conning Station	In general charge.
Executive Officer		Superstructure Deck	In charge deck force.
Gunnery Officer		Bridge	Officer of the deck.
Engineering Officer		General	In charge fueling details.
<u>DECK FORCE</u>			
(a) Bridge Detail			
SC	QM1c	Pilot House	Steersman.
SC	SM3c	Pilot House	Visual signals & relief steersman.
S	Y2c	Bridge	Annunciators.
SC	RM1c	Radio Room	Operator.
SC	RT2c	Radio Room	Radio repairs.

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TABLE 24-4 (cont'd.)

FUELING STATION ASSIGNMENTS

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DIVISION	RANK OR RATE	STATION	DUTIES
		<u>DECK FORCE</u>	
		(a) Bridge Detail	
SC	RdM2c	Radar	Operator.
SC	RdM3c	Radar	Relief operator.
SC	SM2c	Bridge	Visual signals.
SC	RM2c	Bridge	Telephones & relief radio operator.
S	SK1c	Bridge	Telephones & relief annunciators.
SC	QM3c	Steering Engine Room	Stand-by steering engine; telephones.
		(b) Deck Detail	
D	CBM	General	Petty officer in charge; takes ship's draft before and after fueling
D	BM1c	Super. Deck Forward	Petty officer in charge forward
D	BM2c	Super. Deck Aft	Petty officer in charge aft.
D	Cox	Super. Deck General	Line handling.

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TABLE 24-4 (cont'd.)

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FUELING STATION ASSIGNMENTS

DIVISION	RANK OR RATE	STATION	DUTIES
		<u>DECK FORCE</u>	
		(b) Deck Detail	
D	S1c	Super. Deck Forward	Line handling.
D	S1c	Super. Deck Forward	Line handling.
D	S2c	Super. Deck Forward	Line handling.
D	S2c	Super. Deck Forward	CO ₂ extinguisher.
D	S1c	Super. Deck Aft	Line handling.
D	S1c	Super. Deck Aft	Line handling.
D	S2c	Super. Deck Aft	CO ₂ extinguisher.
		<u>ENGINEERING FORCE</u>	
		(a) Engine Room Detail	
E	CMoMM	General	Petty officer in charge.
E	MoMM1c	Engine Room	Starboard throttle.
E	MoMM2c	Engine Room	Port throttle.
E	MoMM3c	Engine Room	Pumps.
E	EM1c	Engine Room	Distribution on board & generators.

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TABLE 24-4 (cont'd.)

FUELING STATION ASSIGNMENTS

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DIVISION	RANK OR RATE	STATION	DUTIES
		<u>ENGINEERING FORCE</u>	
		(a) Engine Room Detail	
E	F1c	Engine Room	Telephones.
		(b) Forward Fueling Detail	
E	MoMM1c	Forward Super. Deck	Petty officer in charge.
E	MoMM2c	Tank Well Deck	Sounding tubes for tanks listed TABLE 24-5.
E	MoMM3c	Forward Super. Deck	Tends hose & fueling valve.
E	F2c	Forward Super. Deck	Tends hose & fueling valve.
E	EM2c	Forward Super. Deck	CO ₂ extinguishers.
SC	RM3c	Forward Super. Deck	Telephone to bridge.
		(c) After Fueling Detail	
E	MoMM2c	After Super. Deck	Petty officer in charge.
E	MoMM3c	Tank Well Deck	Sounding tubes for tanks listed TABLE 24-6.

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TABLE 24-4 (cont'd.)

FUELING STATION ASSIGNMENTS

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DIVISION	RANK OR RATE	STATION	DUTIES
		<u>ENGINEERING FORCE</u>	
		(c) After Fueling Detail	
E	F1c	After Super. Deck	Tends hose & fueling valve.
E	F2c	After Super. Deck	Tends hose & fueling valve.
E	EM3c	After Super. Deck	Telephone to bridge.
D	GM2c	After Super. Deck	CO ₂ extinguishers.
		<u>SPECIAL DETAIL</u>	
S	SC1c	Galley	Regular.
S	SC3c	Galley	Regular.
D	S2c	Galley	Mess cook.
D	S2c	Galley	Mess cook.
E	F1c	Galley	Mess cook.
S	StM1c	Ward Room	Regular.
S	StM2c	Ward Room	Regular.
S	PhM1c	Hospital Room	Regular.

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TABLE 24-5

FORWARD FUELING DETAIL

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CONN. NO.	LOCATION OF CONN.			D.O. FILLING CAP			D.O. TANK
	P/S	FRAME	DECK	DESCRIPTION	P/S	FRAME	
0	P	13-14	Super.	D.O. Filling A-902F	P	13-14	A-902F*
1	S	13-14	Super.	D.O. Filling A-903F	S	13-14	A-903F*
2	P	13-14	Super.	D.O. Filling A-904F	P	13-14	A-904F*
3	S	15-16	Super.	D.O. Filling A-905F	S	15-16	A-905F*
4	P	15-16	Super.	D.O. Filling A-906F	P	15-16	A-906F*
5	S	15-16	Super.	D.O. Filling A-907F	S	15-16	A-907F*

TABLE 24-6

AFTER FUELING DETAIL

6	P	17-18	Super.	D.O. Filling A-908F	P	17-18	A-908F*
7	S	19-20	Super.	D.O. Filling A-909F	S	19-20	A-909F*
8	P	17-18	Super.	D.O. Filling A-910F	P	17-18	A-910F*
9	S	27-28	Super.	D.O. Filling C-203F	S	27-28	C-203F*

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TABLE 24-6 (cont'd.)

AFTER FUELING DETAIL

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CONN. NO.	LOCATION OF CONN.			D.O. FILLING CAP			D.O. TANK
	P/S	FRAME	DECK	INSCRIPTION	P/S	FRAME	
10	P	20	Super.	D.O. Deck Filling	P	19-20	See Note +
1	S	20-21	Super.	L.O. Fill. & Disch. to Deck	S	20-21	A-213Lub**
2	P	19-20	Super.	L.O. Fill. & Disch. to Deck	P	19-20	A-215Lub**

NOTE: * The location of sounding tubes for these D.O. tanks is given in TABLE 24-3; capacities are given in TABLE 24-1 and 24-2.

+ This is a 2" filling and discharge connection directly connected to the D.O. Transfer and D.O. Service Piping.

** Regarding sounding tubes for these Lub. Oil tanks, see paragraph 24-6.

24-14 UPON COMPLETION OF FUELING:-

Upon completion of fueling, hoses are disconnected and passed to fueling ship; spring line is cast off followed by towing line. As towing line is cast off, increase speed to two or three knots over fueling ship's speed and change course two or three degrees away from fueling ship. Do not attempt to clear side at high speed or sharp angle. When clear of fueling ship's side and well ahead, maneuver to resume formation position.

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