Commercial Aspects of Shipping – Bunkers

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The topic of bunkering is not only important from both the commercial and technical perspectives but is also challenging. We have seen earlier that in case of a time charterparty the responsibility of supplying bunkers rests with the time charterer and in the case of voyage charter, it is the ship owner or the disponent owner who supplies the bunkers. In this article and in possibly one more article, we will look at the commercial and technical issues that must be understood and addressed carefully to maximise earnings, not only by proper bunker-supply planning but also ensuring that the bunkers supplied are 'fit for purpose" and thus do not cause damage to the machinery. Further it is also important to pay attention to onboard bunker management – be it the compliance with the "charterparty warranty of fuel consumption" or receiving, storage, purification and mixing of the fuel oil.

Most ships today run their main (diesel) engines using Heavy Fuel Oil (HFO) for normal running. The auxiliary machinery (e.g. electricity generators) usually operates independently from the main engine (although some ships can take power from the main engine to turn the generators). Auxiliary machinery also uses HFO although sometimes Marine Diesel Oil (MDO) or a blend of MDO and HFO or IFO is used. MDO may also be used in older main engines for starting and warm-up or when manoeuvring because the response time to rapid changes of speed or direction of revolutions would be too slow when using HFO. However, so far as possible HFO is used because it is very much cheaper than MDO. When the ship is in port the main engine(s) are, of course, shut down so that the consumption of fuel used reduces but most of the auxiliaries have to run all the time so there is still some usage. If the ship is using its on-board winches or cranes to load/discharge there will be a higher consumption to supply the extra electricity required. Over the years the trend has been to use a single type of oil for both the main and auxiliary engines, called the "unifuel systems".

It will help to recall the process of oil refining which is a form of distillation. The crude oil is heated and the different "fractions" condense at different levels. At the top the gas is drawn off, next comes gasoline (petrol) then come the lighter grades of oils which include kerosene (paraffin) and jet fuel, gas oil and diesel oil. After these lighter grades come the heavier oils which are grouped under the general title of "residual oils". Unfortunately today with the increasing sophistication of the refining of petroleum product the residual oil, which is the main basis of HFO, is becoming poorer in quality. This residual oil is viscous, dense and has various constituents that can be harmful for the machinery if not treated properly, causing even permanent damage. Thus a brief study of the parameters and their limits along with the industry (ISO as well as regulatory such as IMO Annex VI and EU directives) trends will find a place in our "bunkers" related articles.

Fuel for the engine and other machinery in ships is still referred to as 'bunkers' - an expression dating back to the earliest days of steam ships when coal for the engine was stowed in compartments called bunkers. From that came bunker-coal which was shortened to bunkers and the name continued to be used when ships changed from burning coal to burning oil under their boilers and so on to this day. Although the oil is now consumed in an internal combustion engine, the name bunkers is still convenient and unambiguous shipping jargon. Old expressions in shipping die hard for example, when one thinks how rare steam ships now are but one still refers to a ship's progress at sea as 'steaming' and the act of leaving port as 'sailing'.

Following is the brief outline of the topics that will be covered in this article and future bunker articles:

- Bunkers planning in a voyage estimation.
  - Cargo lift, deviation, cost of bunker issues.
- Difference in guiding interests – Commercial and technical
  - This is particularly important when a ship is on a time charter as, under such a charter, the supply of bunkers becomes the charterer's responsibility and so the ship owner and manager loses direct control over quality of the supplied oil. Charterers will always be anxious to keep costs to the minimum and one has to face the fact that they are not directly concerned with the long-term condition of the machinery.
- A review of the Bunker supply related matters
  - Samples of typical bunker clauses in charterparties.
  - Quantity on delivery and redelivery – issues of excess, shortages and measurement procedure.
  - Conformation of supply to the ISO 8217 standards.
    - Is compliance with agreed standard parameters of ISO 8217 is discharge of obligations (Fit for Purpose) under the Sale of Goods Act 1979?
    - Fuel analysis and when to start using the oil.
    - Remedies if supply does not conform to the agreed specifications – legal and practical positions.
    - Precautions to be taken onboard the vessel to protect machinery.
    - Importance of documentation and paper trail to protect owners' interests.

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- Training and awareness of officers in the ship's engine rooms of the quality issues and implications because they are the ones on the spot where the supply is made.

- Dealing with bunker quality issues and environmental issues
  - o New building stage – purification and filtration systems.
  - o Engines – effect of catalytic fines
  - o ISO 8217 – recent changes and need for future changes.
  - o Low sulfur requirements – IMO and EU directives
    - Commercial impact
    - Technical impact
    - Legal issues arising out of non-compliance
- Over-consumption claims.
  - o How a good monitoring and prompt action can help.
- Other issues based on the feedback received from the readers.

Bunkers planning in a voyage estimation

It is important to bear in mind that bunkering a ship is not like a car driving into a garage (gas station), pouring fuel into the tank and driving off again. Bunkering will always cause delay to the vessel and involve additional port expenses, unless it is done concurrently with loading or discharging. The ship has to deviate from her course to approach the bunkering port (which will probably make a charge for entering) and a pilot may have to be taken. If it is an anchorage, the bunker barge has to be awaited; if it is at a jetty, the ship has to be securely moored before hoses can be connected. Further time has to be expended checking the quantity before and after bunkering by 'sounding' the tanks. Even at an efficient bunkering port where the fuel itself can be pumped in at a rate of 250/300 tonnes per hour, a bunkering call seldom takes less than 8~12 hours.

Great care should, therefore, be paid to the question of bunkering as it is possible to make quite a difference to the voyage with prudent bunker buying. The price of bunkers varies significantly throughout the world and a balance has to be made between the quantity of bunkers and the quantity of cargo lifted.

To give an example of a vessel using both HFO and MDO:-

Vessel 40,000 dwt:

Constants 350 tonnes, fresh water 100 tonnes.
Consumption 24 tonnes HFO plus 2 tonnes MDO daily.

At the start of voyage at loading Port 'A' the ship has bunkers remaining on board (ROB) of 400 tonnes HFO and 60 tonnes MDO. Bunkers are available at 'A'. At discharge Port 'C' no bunkers are available at reasonable commercial prices. The most suitable area - 'D' - for loading the next cargo (where bunkers are available at commercial prices) is 14 days steaming away.

On the voyage from 'A' to 'C' the vessel passes Port 'B' where bunkers are cheap but calling charges are $5,000 and delay costs $10,000.

Prices:-

At loading	Port 'A'	$ 320 HFO $510 MDO
At bunkering	Port 'B'	$ 280 HFO $475 MDO

Voyage Time:-

Loading	3 days
Steaming 'A' to 'B'	15 days
Steaming 'B' to 'C'	10 days
Discharging	5 days (shore gear)
Steaming 'C' to 'D'	14 days

The operator has two options.

(a) Bunkering at loading Port 'A'

HFO bunkers needed:-

Steaming 15 + 10 + 14 days	39 days
plus safety margin 3 days =	42 days
42 days x 24 tonnes per day	1008 tonnes
less bunkers on board	400 tonnes
	608 tonnes HFO

MDO bunkers needed:-

Steaming + port time 39 days	+8 days	47 days
plus safety margin 3 days =		50 days
50 days x 2 tonnes per day		100 tonnes
less bunkers on board		60 tonnes
		40tonnes MDO

Cost of bunkering at 'A'

HFO	608t x $320	194,560
MDO	40t x $510	20,400
Total Cost		$214,960

Cargo uplift calculations

Vessel DWTAT (Deadweight All Told)	40,000 tonnes
less:	
Constants	350
Fresh water	100
HFO	1,008
MDO	100
	1,558
DWCC available	38,442 tonnes

(DWTCC – Deadweight Cargo Capacity)

(b) Bunkering at 'B'

Bunkers are used to get from 'A' to 'B' so:

On arrival at 'B' the vessel will have:

HFO ROB at 'A'	400
less used (15 days @ 24t.p.d)	360
ROB at 'B'	40 tonnes
MDO ROB at 'A'	60 less used
less used (18days @ 2 t.p.d)	36
ROB at 'B'	24 tonnes

(Assume these to be sufficient quantities to give an adequate safety margin for the voyage 'A' to 'B').

Bunkers needed to complete the voyage 'B' to 'C' and on to 'D':-

HFO.

Steaming 10 + 14 = 24 + safety margin 3 = 27 days	
27 days x 24 tonnes per day =	648 tonnes
less ROB	40 tonnes
	608 tonnes HFO

MDO.

Steaming 24 + port time 5 = 29 + safety margin 3 = 32 days	
32 days x 2 tonnes per day =	64 tonnes
less ROB	24 tonnes
	40 tonnes MDO

Cost of bunkering at 'B'

HFO 608 x $ 280		170,240
MDO 40 x $475		19,000
		189,240
	Calling cost	5,000
	Cost of delay	10,000
	Total Cost	$204,240

Cargo uplift calculations:

WAT	Vessel	40,000
less:	Constants	350
	Fresh water	100
	HFO	648
	MDO	64
		1,162
		38,838 tonnes

(Bunker weights are taken as that on board at time of sailing from 'B' because this will be when the vessel will have the maximum quantities on board).

Thus it can be seen by bunkering at Port 'B' the operator not only saves $10,720 on the bunkers themselves but also increases the DWCC of the vessel from 38,442 to 38,838 tonnes, an increase of 396 tonnes. If we assume our ship to have been fixed at $32 per tonne, that gives a further improvement of $12,672.

However laborious these calculations might seem, they are the only way to establish the best bunkering policy. There are, of course, many voyages when they would be inappropriate, say when the vessel passes no main bunkering port or where substantial deviation is required to reach one. However, they are well worth doing if the vessel's voyage will take her past one of the main bunkering ports such as:-

Rotterdam; Las Palmas; Cape Town/Durban; Jeddah; Singapore; New Orleans; Los Angeles

The bunker market is a very volatile one. Prices are constantly changing in response to the laws of supply and demand. In recent times, the bunker prices have touched all time highs in dollar terms due to many factors that affect physical supplies but also the sentiment. Not only do prices vary from port to port but also prices from different suppliers within a port differ. An operator* will have to keep a watchful eye on the worldwide bunker market which comprises three elements; cost, availability and quantity, while ensuring that the supplies are made in accordance with the agreed charterparty bunker quality clause.

We will take up some of the balance topics, as listed above, in the March issue of MER.

*Operator: This term is used in context of the party that is carrying out the voyage estimation e.g. even a shipowner contemplating a voyage business or a charter etc.

References:

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