

PERTH CONFERENCE OCTOBER 1991

COMMENTARY

on paper by Jonathan Lux entitled

"BUNKER AT YOUR PERIL"

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First of all I would like to express my appreciation to the Committee of the Association for inviting me to comment on this paper.

There is a particular reason why I was very pleased to accept that invitation. Alex Parks was a very good friend of mine and of many members in the audience. Jonathan and I were both Associate Authors of Alex' magnum opus *The Law of Marine Insurance and Average*. I am sure he would be delighted to see us on the same platform today.

Jonathan has spoken of the dearth of UK cases. There is a dearth of Australian cases too. I must apologise that my limited access to law reports prevented me from checking on New Zealand cases. Perhaps another of Alex' Associate Authors, Tom Broadmore, could help us.

The only Australian case I have been able to find is Westfal-Larsen & Co. A/S v. Colonial Sugar Refining Co. Ltd. (1960 NSW 170). The case is an unusual one since it arises out of a general average. The case is of interest from another point of view - counsel for the plaintiff was Mr. L.W. Street briefed by Ebsworth and Ebsworth. I need hardly tell you that the plaintiff succeeded.

A vessel named *Evanger* was time chartered by Westfal-Larsen to CSR in 1951. Shortly before going on charter she had bunkered in Balikpapan and the bunkers were put in a tank that was not used until after the ship left Mackay for Brisbane and Melbourne with a cargo of sugar. Shortly after leaving Mackay it was found she could not maintain steam.

After various anchorings and efforts to get up steam and taking on diesel from other vessels, she made Gladstone bunkered with diesel and continued. The bunkers taken on in Balikpapan were the cause of the failure to keep up steam.

The plaintiff shipowner called a general average over the extra expenses and the action was to recover the defendant CSR's share of that general average. It is hardly surprising that CSR's response was that the taking of the faulty bunkers was the responsibility of the owner and the charterer should not be visited with that.

Unfortunately for CSR, Clause 13 of the charter provided that "Owners only to be responsible for delay during the currency of the charter if such delay has been caused by want of due diligence on the part of the owners or for any OTHER personal act or omission or default of the owners". Walsh J. held that "unless the plaintiff be relieved from responsibility by reason of Clause 13 the defendant should succeed". He went on to find, however that the taking of the faulty bunkers was not a personal act, default or omission by the owners and therefore they were entitled to succeed.

In the course of the judgment, his Honour found that the ship was unseaworthy because of the faulty fuel oil. He rejected a submission by Mr. Street that there was a special and independent contract in relation to the fuel oil because there was a specific provision (Clause 5) in the charterparty relating to bunkers at delivery and redelivery.

He went on to say

"In my opinion the prima facie liability of the owner (ie. apart from Clause 13) is established and for the purpose of determining the existence of that prima facie liability, it is immaterial to determine whether it should be regarded as founded on an implied term as to seaworthiness, upon the express term as to being fitted for cargo service or upon a breach of an obligation implied in Clause 5 itself or upon all three".

One can hope that the low incidence of bunker fraud in Australia and New Zealand is due to the innate honesty of Australians and New Zealanders. That may be the case. But there are some special factors

- . The small number of bunker manufacturers and the high reputations each enjoy
- . The small number of bunker suppliers with similar high reputations
- . So far as stealing from cargo is concerned, all ships on the Australian coast are effectively owned by the oil industry so the industry would be stealing from itself.

But bunker fraud is alive and well! There are many ports where smart bunker suppliers are willing to take down an unsuspecting Chief Engineer. Some of the lurks are alteration of the capacity tables of the bunkering barge, putting a false bottom in the barge tanks underneath the hatch, altering the sounding rods and ensuring that the right amount of material is in the sounding pipe when the Chief Engineer does the sounding.

A significant fraud came to light in August this year. A vessel named Anangel Leader was arrested in Anchorage, Alaska. She had been on charter to the Military Sealift Command carrying ammunition for Operation Desert Storm. The measurement of bunkers at delivery and redelivery were falsified, the Chief Engineer admitting that he "short taped" the measurements. That is he deliberately altered the sounding tape or plugged the sounding pipe. The amount of the fraud was \$85,000.

It was an expensive frolic. Within 2 weeks, the owner agreed to pay the US government \$1 million, and to make restitution of \$85,000. And the owner may be subject to a further fine of up to \$500,000. The Master and the Chief Engineer have been separately charged with conspiracy to defraud and making false statements. The maximum penalties are 45 years in prison or a fine of \$2 million or both.

A modern diesel engine will burn almost any type of oil of diesel grade or heavier. One can run a small diesel engine on a mixture of 80% diesel and 20% gasoline. Centistokes and seconds Redwood are methods of measuring viscosity and relate to the time taken for a given volume at a given temperature at atmospheric pressure to pass through a fixed orifice. Fuel oils up to 700 cs can be used. 180 cs fuel oil is the one usually used in marine diesels but fuel oil up to 360 cs is not uncommon. When you take into account that 180 cs fuel oil often must be heated to 40 degrees centigrade to make it pumpable, one can imagine just how viscous 700 cs fuel oil would be. The viscosity at the point of

injection into the engine is usually about 12 cs. For 180 cs fuel oil, this means that the temperature must be of the order of 115 to 120 degrees centigrade. The heavier the fuel oil, the higher the temperature at injection and the larger the nozzle on the injection equipment.

This slide shows the specification for the main engine of a particular ship.

SLIDE I

You can see that the engine manufacturer is saying that any fuel oil in the range 320 - 380 cs is acceptable.

Of the other parameters, aluminium and silicon give rise to abrasive wear. Indeed aluminium silicate is a grinding paste used to seat valves.

Jonathan has referred to the British Standard BS MA 100: Petroleum Fuels for Marine Oil Engines and Boilers and this slide gives a tabulation of the standard.

SLIDE II

I do not intend to dwell on it unless there is a Chief Engineer present who can tell us what all of it means.

Crude oil is made up of many different hydrocarbons each with a different volatility and flash point. The lighter the crude oil, the more volatile it is and the greater the volume of hydrocarbons with a low flash point. The process of refining is designed to separate groups of hydrocarbons and chemically change those groups produce the products that we use each day. The process of separation is called distillation. There are a number of processes of chemical change such as catalytic cracking, reforming, alkylation, polymerisation etc. By the time fuel oil is made, all the light hydrocarbons have been taken off as gasoline, naphtha, butane, propane, diesel and so on. Fuel oil has very few light hydrocarbons and its flash point is around 60 degrees centigrade. The danger with using crude oil is that the light hydrocarbons escape and form an air gas mixture in the explosive range.

Any source of ignition will cause an explosion as the "Spyros" and "Haralabos" cited by Jonathan show. The flash from a camera is enough. Yet owners and officers go to extraordinary lengths to steal crude oil to save on bunkers and run the risk of killing the crew and losing the ship.

Talking of stealing the cargo leads me to one case where the cargo is used as fuel as part of the design of the ship and its machinery. In LNG carriers the cargo must be carried under pressure and is cooled to around minus 180 degrees centigrade.

The cooling process includes allowing part of the cargo to "boil off". In doing so it absorbs heat from the remainder of the cargo. That quantity is fed back into the boiler to produce steam for the propulsion turbines. But the safety precautions are very very stringent.

As Jonathan has quite rightly pointed out it is the cost of bunkers that drove so many shipowners and their Masters and Chief Engineers to crime. This slide show the high and low points of the price of 180 cs fuel oil in Singapore in the years 1984 to 1991 and the average price in each year.

SLIDE III

Look at 1986. And because I know all of you want to rush out and bunker your ships at the end of this session, fuel oil in Singapore at present is in the range of \$US90 to \$US95 per tonne.

Of course preventing fraud is a matter of careful management as well as catching and punishing the culprits. Chief Engineers and surveyors need to be alert when buying bunkers or checking bunkers on and off charter. But it is fair to say that environmental concerns and rapidly escalating P and I cost have led many charterers to carefully vet the vessels that they take. This is in addition to flag State, port State, classification society and P & I Club checks. Many companies, particularly international oil companies, are refusing to take a vessel on charter unless she has been inspected by one of their own inspectors and found acceptable. These checks, too, will help reduce the incidence of bunker fraud.

My thanks in the preparation of this paper to Ray Burke, Burke and Parsons, New York for material on Anangel Leader; to George Quine, former Engineer Superintendent of Caltex Tanker Company and Paul McShane of Caltex Refining Company for enormous help on the technical matters; and to James Taylor from my department in Caltex for research.

Fuel Specification

Density 15°C	g/ml	0.985 - 0.995
Viscosity 50°C	mm ² /s	320 - 380
Carbon Conradson	% by mass	11.0 - 13.6
Ash	% by mass	0.027 - 0.052
Asphalt	% by mass	7.5 - 8.1
Sulphur	% by mass	23 - 27
Lower calorific value	kJ/kg	39750 - 40350
Water	% by mass	traces up to 0.2
Vanadium	mg/kg	98 - 135
Sodium	mg/kg	5 - 15
Aluminium	mg/kg	1 - 22
Silicon	mg/kg	4 - 44

BS MA 100: Petroleum Fuels for Marine Oil Engines and Boilers

Property	Class M1	Class M2	Class M3	Class M4	Class M5	Class M6	Class M7	Class M8	Class M9	Class M10	Class M11	Class M12
Density at 15°C, g/ml, max.	-	.9000	.9200	.9910	.9910	.9910	.9910	0.9910	0.9910	-	-	-
Viscosity, kinematic, at 40°C cSt,* min. max.	1.50 5.50	- 11.00	- 14.00	- -	- -	- -	- -	- -	- -	- -	- -	- -
Viscosity, kinematic, at 80°C, cSt,* max.	-	-	-	15.00	25.00	45.00	75.0	100.0	130.0	75.0	100.0	130.0
Cetan e index, min.	45	35	-	-	-	-	-	-	-	-	-	-
Carbon residue, Ramsbottom, % (m/m), max.	-	0.25	2.5	-	-	-	-	-	-	-	-	-
Carbon residue, Ramsbottom on 10% residue, % (m/m), max.	0.20	-	-	-	-	-	-	-	-	-	-	-
Carbon residue, Conradson, % (m/m), max.	-	-	-	12.0	14.0	20.0	22.0	22.0	22.0	-	-	-
Flash point, closed, Pensky Martens, °C, min.	43.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Water content, % (V/V), max.	0.05	0.25	0.30	0.50	0.80	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Sediment by extraction, % (m/m), max.	0.01	.0.2	-	-	-	-	-	-	-	-	-	-
Ash, % (m/m), max.	0.01	0.01	0.05	0.10	0.10	0.15	0.20	0.20	0.20	0.20	0.20	0.20
Sulphur content, % (m/m), max.	1.00	2.00	2.00	3.50	4.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Cloud point, °C, max.	16	-	-	-	-	-	-	-	-	-	-	-
Pour point, upper** °C. max. (1 Dec. to 31 Mar.) (1 Apr. to 30 Nov.)	- -	0 6	0 6	24 24	30 30	30 30	30 30	30 30	30 30	30 30	30 30	30 30
Vanadium content, mg/kg as V, max.	-	-	100	250	350	500	600	600	600	600	600	600

* 1 cSt = 1 mm²/s. ** The word "upper" does not apply to classes M2 and M3.
Other properties for which requirements will be specified when test methods are developed.

Ignition quality, min.	-	-	*	*	*	*	*	*	*	-	-	-
Total sediment, max.	-	-	**	**	**	**	**	**	**	**	**	**
Aluminium content, mg/kg max.	-	-	30	30	30	30	30	30	30	-	-	-

* A limit for this property is considered to be important, but no suitable method of test is available.

** A value is to be agreed on the basis of a method which is in course of development; values will be added by amendment to this standard following normal consultations.

Fig. 1 the standard also specifies the test methods to be used for the determination of the properties given in the table.

SINGAPORE FOB PLATT'S BUNKER PRICE

FOB S'PORE \$/MT	1984	1985	1986	1987	1988	1989	1990	1991 (TO 1 OCT)
HSFO 180 CS								
MAX	191.50	176.00	149.00	124.50	91.50	108.00	178.50	192.50
MIN	166.50	139.00	46.00	66.50	48.00	69.50	56.50	70.50
AVE	178.17	156.63	75.83	100.96	73.72	90.64	108.92	93.39
HSFO 380 CS								
MAX		173.00	144.00	120.00	87.50	104.00	173.50	182.50
MIN		136.00	41.00	62.50	44.00	60.50	51.50	59.50
AVE		153.32	71.04	97.06	69.73	86.08	103.15	85.90