

EMSA Workshop on
Handling Cargo Residues
Lisbon, 7th December 2007

Transport of oil: blending and
industrial processing on
board ships



Tim Wilkins
Regional Manager Asia-Pacific
Environmental Manager

- Blending, mixing or processing
 - Defining such operations
 - When and Why
- Other cargo operations
 - Cargo waste streams
- Summary remarks

Note: Transport of Oil; defined as MARPOL Annex I cargoes only

Defining the operations (1)

- Blending, mixing or processing...
 - Several terms for similar/same operations
 - Blend(ing)
 - Commingle
 - Mix(ing)
 - Cargo top-up
 - Additivation/addition
 - Admixture/admixing
 - Compounding
- “Blending activities”

Defining the operations (2)

- Blending Activities
 - Combining cargoes
 1. Fuel oil for ships
 2. Other products (fuels) based on charterer requirements
 - Addition of a chemical additive to a cargo;
 3. Inhibitors, enhancers, dyes etc.

Combining cargoes

1. Fuel oil for ships

- Blending gasoil and fuel oil to produce IFO, HFO etc.
 - Fuel oil (high viscosity) blended with gasoil to lower the viscosity for above
- Commercially/regulatory driven operation which allows for certain characteristics to be attained by fuel supplier (e.g. 1.5% sulphur or ISO8217 type of fuel)
- Frequently carried out onboard bunker barges
- No residue or waste stream
- Difficult to ascertain final product properties – may lead to user consequences when delivered to ships:
 - Flash-point
 - High abrasives
 - H₂S content

Blending activities: what (2)

Combining cargoes

2. Other products (fuels) based on charterer requirements
 - Different grades of cargo may be mixed depending on the charterers requirements
 - To produce different/better grade of fuel oil
 - To produce different ADO products or grades for commercial purposes
 - Operation:
 - While loading
 - Common: 40% grade 'a', 60% grade 'b'
 - After loading
 - Less Common: Different grades loaded in sequence onboard

Blending activities: what (3)

Addition of a chemical additive to a cargo

- Additives may be added to cargo
 - Commonly carried out at terminal/storage tank facility
 - in-line injection via cargo/ships manifold
 - in-line injection between tanks
 - May be carried out on board
 - via homogenizer at cargo manifold – not always effective or desired due to potentially ineffective mixing
 - in-line injection between tanks
 - Undertaken to:
 - Facilitate **handling** of cargo
 - Increase **safety** when handling of cargo
 - Change cargo characteristics for **commercial** / regulatory purposes
 - Combination of above

Blending activities: what (4)

Addition of a chemical additive to a cargo

- Some commonly used additives:
 - **Antifoam agents:** reduce foaming in products e.g. silicone oil may be used for large surface bubbles with other polymers for smaller, entrained bubbles
 - **Antistatic:** also known as conductivity improvers and used with jetfuel to remove static charges
 - **Cloud Point** additives: postpones the process of crystallisation in gasoils during cooling
 - **Inhibitors:** to prevent polymerisation used for example with styrene
 - **Marker Dyes:** commonly used as per charterer or customs requirement (aviation fuel blue or green; red diesel)
 - **Pour Point Depressants** (PPDs): commonly used for fuel and crudes to improve cold flow property of the cargo. May also be used on distillates but termed flow improver which decreases the cloud point then in turn the 'cold filter plugging point' (CFPP)
 - **Stabilizers:** such as anti-oxidants (phenols) for jetfuels e.g. Stadis

Blending activities: why (1)

Charterer request

- Blending activities on board tankers are carried out at charterer request using standard charter party blending clauses
- And is not generally part of a carrier's normal responsibilities

Charterers shall have the option to blend and/or commingle and/or inject additives and/or add dye and/or add PPD ('blending activities') to the cargo onboard the vessel

Charterers will indemnify owners against liability for any cargo quality claims that may arise as a direct result of these onboard blending activities

*New B/L to be provided by Master on completion of 'blending activities' which will reflect the actual grade that has been blended/commingled/injected/dyed/has had PPD added**

* i.e. what is discharged is clearly not what has been loaded

Blending activities: why (2)

Charterer request

- Owners reluctant to undertake such operations
 - Owners may seek indemnity (LOI) for problems arising due to any blending activities
 - Owners will follow charterers operational instructions (when available)* but owner may need to...
 - Request declaration that addition will not provoke damage to vessel
 - Request declaration that additivation will not cause formation of sludge, sediment or ROB in ships cargo or slop tanks
 - Request declaration that additivation operation will not cause safety risk to crew
 - Request responsibility for cargo residue disposal and tank cleaning as appropriate

* some charterers have standard HSE procedures for undertaking such operations



Blending activities: why (3)

Charterer request

- Risk assessment may be carried out by charterer but...
 - Problems may still be faced on board:
 - Risk of sedimentation and accumulation of slops after repeated blending activities
 - Possible excessive incompatibility of resultant mixture/product
 - Potential for damage to ships equipment and tanks (coatings)

Charterer request

- Risk assessment may be carried out by charterer but...
 - Problems may still be faced on board:
 - Slop disposal problems – vessel on spot market - charterers change frequently, with new charter party previously generated slops are not responsibility of new charterer
 - Slop disposal problems - vessel on time charter - charterer's prerogative to retain accumulated slops on board for duration of the charter period
 - Owners able to ascertain quantity of cargo but not quality of cargo
 - Hence, owners reluctant to undertake such operations

Other cargo operations (1)

- Cargo waste streams
 - Cargo generated waste = Slops
 - Slops
 - may contain more than one type of cargo from repeated tank washing on successive voyages and subsequent accumulation
 - may contain additives because of blending activities
 - may contain tank cleaning chemical and/or emulsifying chemical residues

Other cargo operations (2)

- Cargo waste streams - Slops
 - Tank cleaning chemicals
 - For example, used when required to carry clean product when previous cargo was a dirty product
 - Emulsifying chemicals
 - Used with black oils when oil is heavier than water – chemical emulsifies oil to ensure it is able to separate from water



Summary remarks (1)

- Blending activities are common for MARPOL Annex I cargoes
 - Combining fuels on bunker barges
 - May not always yield desired fuel specification
 - Additives for safety, handling or commercial reasons
 - Owners in general are reluctant to undertake blending activities onboard (recognition of safety, handling and commercial necessity for additives)

Summary remarks (2)

- Cargo residues (slops) from blending activities difficult to deliver ashore
 - Delivery of MSDS with cargo and fuel will assist
 - Charterers responsibility to accept slops at (loading/unloading) terminals
 - Charterers responsibility to commit for disposal in voyage charter terms
- Cargo residues (slops) from tank cleaning also difficult to deliver ashore
 - Easier to provide information on slop characteristics based on commonly used tank cleaning products
 - But facilities still reluctant to receive 'contaminated' slops
- Cargo residues (slops) from multiple cargoes difficult to deliver ashore
 - Uncertain as to nature of slops owing to mixing of different cargoes



INTERTANKO

thank you

www.intertanko.com

tim.wilkins@intertanko.com