



ISO 8217:2010

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THE PHILOSOPHY BEHIND THE CHANGES – DRAFT/VISWA LAB APPROACH



1. PRESENCE OF H₂S IN LIQUID PHASE

- HOW MANY CASES OF H₂S CONTAMINATED BUNKERS IDENTIFIED IN THE LAST ONE YR?
- SECOND, OTHER TOXIC SUBSTANCES IN BUNKER (SUCH AS ORGANIC ACIDS) COULD ALSO BE FATAL WHEN INHALED UNDER HEATED CONDITIONS. NO TESTING INTRODUCED FOR ORGANIC CHEMICALS.
- H₂S IN LIQUID CAN BE 2 MG/KG, WHILE IN THE VAPOR HEADSPACE IT CAN BE 10 TO 50 TIMES OF THIS DEPENDING ON VARIOUS FACTORS.
- IDEALLY EVERY SHIP TO MEASURE AND RECORD HEADSPACE H₂S WILL BE THE BEST SAFETY MEASURE.
- QUESTION IS HOW THE SUPPLIER IS GOING TO MEASURE IT BEFORE HE SUPPLIES.
- **VL CONCLUSION** : MORE STUDY BEFORE INTRODUCING THIS NEW TEST.



2. CCAI and FIA

- VL CARRIED OUT INDEPENDENT RESEARCH INTO THIS TOPIC.
- IGNITION AND COMBUSTION PROPERTIES DETERMINED BY FUELTECH INSTRUMENT ARE NOT RELIABLE.
- MARINE ENGINES USING SANTOS BRAZIL FUEL WITH ECN OF 5 ARE RUNNING MAIN MACHINERY WITHOUT ANY PROBLEMS WHILE SOME OTHER FUELS WITH HIGH ASPHALTENES/CCAI AND MCR, THOUGH HAVING REASONABLE ECN (19,20,21), ARE CAUSING PISTON RING BREAKAGE IN THE MAIN ENGINE.
- VL BELIEVES THE PROBLEM COULD BE WITH AMOUNT OF AROMATICS PRESENT IN THE FUEL.
- SANTOS FUELS HAVE HIGH AROMATICS AND A LOW ECN DOES NOT SEEM TO MATTER. COMBUSTION PERIOD IS LOW.
- PROBLEM FUELS WITH BROKEN PISTON RINGS HAVE LOW AROMATIC CONTENT. LONG COMBUSTION TIMES.
- THEREFORE THE COMPUTATION OF ECN IN THE INSTRUMENT MAY HAVE TO BE ALTERED.



2. CCAI and FIA (Contd...)

- CURRENTLY ECN IS REPRESENTATIVE ONLY OF THE IGNITION PROPERTY AND DOES NOT TAKE COGNIZANCE OF THE COMBUSTION PROPERTIES OF THE FUEL.
- IN SLOW SPEED ENGINES AND RESIDUAL FUEL, COMBUSTION AND IGNITION ARE INDEPENDENT PHENOMENA AND AN ECN BASED ONLY ON IGNITION PROPERTY ALONE IS AN INCORRECT WAY TO REPRESENT THE IGNITION AND COMBUSTION PROPERTIES OF THE FUEL.
- TO SUM UP, ONCE THIS COMPUTATION OF ECN IS ALTERED, WE FEEL THIS INSTRUMENT WILL DEFINITELY BE ABLE TO CHARACTERIZE THE FUEL CORRECTLY.
- IN THE MEANTIME, CCAI CAN BE USED ONLY AS A GUIDANCE SINCE CCAI NUMBERS ARE NOT RELIABLE. THIS IS THE SITUATION THAT EXISTED PRIOR TO ISO 8217:2005.



3. BLENDING BIODIESELS IN MARINE FUELS

VISWA LAB BELIEVES THAT THE BLENDING SHOULD BE DEFERRED. THE MAIN RISK IS THAT IF THE BIODIESEL MANUFACTURED IS NOT STABLE IT CAN RESULT IN DECOMPOSITION GENERATING COMPOUNDS WHICH ARE ACIDIC IN NATURE AND WHICH WILL CAUSE MACHINERY DAMAGE.



4. MEASUREMENT PRECISION ISO 4259

- ISO 4259 PROVIDES AN ALLOWANCE FOR REPRODUCIBILITY VARIATION AMONG RESULTS.
- SOME SUPPLIERS TAKES FULL ADVANTAGE OF THIS TO THEIR BENEFIT.
- WHILE STATISTICAL PRECISION STANDARD MAY ALLOW LATITUDE, A STANDARD HAS A RIGHT TO RESTRICT A VALUE TO A CERTAIN NUMBER WHICH CANNOT BE A MOVING TARGET.
- EXAMPLE: MEPC OF IMO CATEGORICALLY TOOK THE STAND THAT SULFUR CAN NEVER EXCEED 1.50% PERIOD. THIS MEANS THAT SUPPLIER HAS TO SUPPLY A FUEL WITH ONLY 1.42% MAX SULFUR.
- THIS SIMPLE INTERPRETATION WILL SAVE LOT OF CONFUSION AND ALSO LOT OF UNDUE ADVANTAGE TAKEN BY SOME SUPPLIERS.
- IN THE CASE OF DENSITY, SOME SUPPLIERS ARE INTERESTED IN PUSHING UP THE DENSITY SINCE THEY ARE PAID ON THE MASS OF FUEL WHILE FUEL USERS WILL FIND THAT PURIFIERS CANNOT PROPERLY PURIFY THE HIGH DENSITY FUEL AND THEY WILL PAY FOR THE USE OF A DIRTY FUEL THAT RESULTS IN HIGHER WEAR AND TEAR.



5. VISCOSITY LIMITS OF DMA AND MGO

- THE VISCOSITY LIMIT SHOULD BE AROUND 3.5 CST
- WHERE ENGINE TEMPERATURE IS HIGHER BECAUSE THE ENGINE HAS JUST USED HEAVY FUEL, THE DANGER OF VISCOSITY DROPPING BELOW 2 CST WILL NOT BE THERE.
- BASED ON OVER 4,000 DIESEL SAMPLES TESTED BY VISWA LAB, THE AVERAGE VISCOSITY @ 40 DEGC OF DISTILLATE FUELS IS 3.71 CST (FOR DMA ALONE IS 3.65 CST AND MGO IS 3.33 CST). ABOUT 5.7% OF THE SAMPLES HAD VISC @40 BETWEEN 2 CST AND 2.5 CST.
- VISWA LAB PROPOSES A CHANGE IN THE VISCOSITY LIMITS FROM 1.4 AND 2.0 CST TO 3.5 CST. THIS WILL TAKE CARE OF MAIN ENGINE PROBLEMS THAT COME UP WITH VISCOSITY LESS THAN 2 CST IN THE ENGINE ENTRY POINT.
- THERE MAY NOT BE A NEED TO FIT CHILLERS/COOLERS IN THE FUEL LINE.



6. PROPOSED RME 180 REQUIREMENT

- DNV SUGGESTS RME 180 MAY NOT BE AVAILABLE. SUGGESTS RMG 180
- VISWA LAB BELIEVES PROPOSED RMG GRADE FUELS LIKELY TO CAUSE PROBLEMS ONBOARD SINCE THE SPEC LIMITS ARE TOO GENEROUS ON MCR, VANADIUM
- NON AVAILABILITY OF RMG 180 APPLIES ONLY TO 1 OR 2 PORTS. THE FUELS USERS NEEDS ARE NOT MET IF THE SPEC IS BENT TO SUPPLY RMG 180 IN ONLY ONE OR TWO PORTS.



7. AL+SI LIMIT (60 MG/KG)

- VL CARRIED OUT PURIFIER EFFICIENCY TESTS BOTH SPECTROSCOPICALLY AND THROUGH PATENTED PARTICLE COUNT METHOD.
- PURIFIER EFFICIENCIES CAN VARY WILDLY FROM 30% TO 60/70%. - GLOBAL AVERAGE AL+SI VALUE IS ONLY AROUND 18.9 PPM. THERE IS NO NEED TO SPECIFY 60 PPM - AN UNNECESSARY CONCESSION IN THE DRAFT STANDARD.
- % WHEN AL+SI HAS EXCEEDED 60 PPM IS LESS THAN 0.7%
- % WHEN AL+SI HAS EXCEEDED 40 PPM HAS BEEN ABOUT 8.9%
- ENGINE MAKERS DO NOT PERMIT MORE THAN 15 PPM OF AL+SI INTO THE ENGINE.
- IF THE LIMIT IS KEPT AT 40 PPM, EVEN IF THE PURIFIER PERFORMS AT 60% EFFICIENCY, CATFINES REACHING THE ENGINE WILL FALL WITHIN THE LIMITS SPECIFIED BY MARINE ENGINE MAKERS.



8. LUBRICITY (WEAR AREA LIMIT OF 520 MICRONS)

- EVEN THOUGH THE SULFUR LIMIT IS 0.1% (1000PPM), IT IS WIDELY FEARED THAT SUPPLIERS WILL GET DIESEL FUEL FROM THE AUTOMOBILE INDUSTRY WHICH ARE ULTRA LOW SULFUR FUELS (LESS 15 PPM).
- DRAFT STANDARD GIVES AN UPPER LIMIT FOR SULFUR BUT DOES NOT PROVIDE A LOWER LIMIT.
- THE STANDARD CAN SAY “NOT LESS THAN 0.05% AND NOT MORE THAN 0.1%.”
- HOWEVER IF ULS FUEL (WITH S LESS THAN 15 PPM) IS USED IN THE ENGINE, DEFINITELY LUBRICITY PROBLEMS WILL BE ENCOUNTERED.



8. LUBRICITY (WEAR AREA LIMIT OF 520 MICRONS)

- STANDARDS SHOULD SAY THAT IF THE DMA OR MGO SUPPLIED HAS LESS THAN 0.05% SULFUR, A LUBRICITY TEST HAS TO BE CARRIED OUT AND THE WEAR AREA LIMITED TO 520 MICRONS. IF SULFUR CONTENT FALLS WITHIN 500 TO 1000 PPM, NO NEED TO CARRY OUT LUBRICITY TEST.
- THE PROPOSED HFRR METHOD OF MEASURING LUBRICITY IS CONSIDERED BY SOME AS INAPPROPRIATE FOR THE RUBBING SURFACE OF THE MARINE DIESEL ENGINE WHICH ARE MOSTLY RECIPROCATING.
- THE HFRR METHOD HAS A WIDE "PERMITTED VARIATION" OF OVER 100 MICRONS.
- THIS WHOLE TOPIC MAY REQUIRE FURTHER RESEARCH



9. ACID NUMBER

- THE ACID NUMBER LIMIT SHOULD BE STATED AS 0.8 TO 1.0.
- WHEN FUEL IS REFINED FROM NAPHTHENIC CRUDE, IN THIS CASE THE ACID NUMBER CAN BE UPTO3.0.
- MORE IMPORTANT THAN THESE NUMBERS IS THE PH VALUE OF THE FUEL. PH REPRESENTS THE ACTIVE HYDROGEN WHICH ACTUALLY PROMOTES CORROSION.
- A METHOD FOR EXTRACTING THE ACIDS FROM THE BUNKER FUEL AND CARRYING OUT THE PH ON THIS AQUEOUS MEDIUM SHOULD BE SPECIFIED ALONG WITH THE LIMIT. BUNKER FUEL CAN HAVE A TAN OF 5 OR 10 AND IF IT HAS A TBN OF 5 OR 10, IT IS TOTALLY NEUTRALIZED AND IT HAS NO CORROSIVE PROPERTIES.
- **PH IS THE TRUE INDICATOR OF THE CORROSIVE POTENTIAL OF THE FUEL.**



10. STRONG ACID NUMBER

- THE STANDARD SHOULD SPECIFY WHICH STANDARD AND THE YEAR SHOULD BE GIVEN.
- THIS STANDARD HAS UNDERGONE CHANGES NEARLY EVERY YEAR AS FAR AS ASTM IS CONCERNED.

11. TSP REPLACED BY TSA

- WHERE TSA SHOWS HIGH VALUES, IT SHOULD BE SUBJECTED TO THERMAL AGING (TSP) AND THIS VALUE SHOULD BE THE FINAL ACCEPTED VALUE.
- TSA OFTEN GIVES HIGH VALUES IF NOT PERFORMED CORRECTLY.



12. WATER (LIMIT IS 0.5%)

- AVG WATER GLOBALLY TESTED BY VISWA LAB IS 0.14% (BASED ON AVERAGE OF OVER 40,000 SAMPLES RECEIVED FROM ALL PARTS OF THE WORLD AND TESTED BY VISWA LAB).
- VISWA LAB PROPOSES A LIMIT OF 0.2%. WHY PROVIDE A LIMIT OF 0.50%.
- INTERESTING FACT IS THAT THE FUELS SUPPLIED IN JAPAN HAVE AN AVERAGE WATER OF ONLY 0.06%, WHEREAS AT SINGAPORE THE AVERAGE IS 0.16% AND IN THE ARA AREA IS IT 0.14%.
- THE PERCENTAGE OF FUELS WHICH WATER OVER 0.2% WAS ONLY ABOUT 11%



13. MCR

- THE GLOBAL AVERAGE MCR VALUES OF SAMPLES TESTED BY VISWA LAB WAS 12.59.
- THE LIMIT CAN BE SET AT 15% INSTEAD OF 15% AND 18%.
- GLOBALLY, THE PERCENTAGE OF FUELS THAT HAD MCR OVER 15% WAS ONLY ABOUT 16% WHICH COMES MAINLY FROM 2 PORTS

14. VANADIUM

- THE GLOBAL AVERAGE FOR VANADIUM TESTED BY VISWA LAB WAS 90 PPM.
- THE NUMBER OF SAMPLES WITH VANADIUM OVER 150 PPM IS ABOUT 12.5%.
- WHY NOT HAVE A 150 PPM LIMIT INSTEAD OF 300 PPM?



15. UPPER POUR POINT

- THE GLOBAL AVERAGE FOR POUR POINT IS 4.8 DEGC
- WHY PROVIDE A UPP LIMIT OF 30 DEG C. WHY NOT 15 DEGC?
- THE AVERAGE SEA WATER TEMPERATURE FOR ALL OCEANS IS 16.4 DEGC.
- THIS PROVIDES SUBSTANTIAL RISK OF WAX FORMATION IN THE FUEL IF THE TEMPERATURE IS NOT MAINTAINED 10 TO 15 DEGC ABOVE THE POUR POINT.
- THE PERCENTAGE OF SAMPLES THAT EXCEEDED 15 DEGC WAS ABOUT 10% ONLY.



16. WATER IN DISTILLATE FUELS

- THE GLOBAL AVERAGE FOR WATER FOR DMB FUELS IS 0.02%.
- THE LIMIT PROPOSED OF 0.30% IS NOT NECESSARY.

CONCLUSION : THE DRAFT APPEARS TO GIVE MORE WEIGHTAGE TO THE NEEDS OF THE FUEL SUPPLIER THAN THE FUEL USER.



VISWA LAB

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MACHINERY PROBLEMS**

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