

**PAME I-2015 –Agenda Item 4.8(a)  
AMSA Recommendation II(H)**

**Developments at the IMO on the topic of “Impact on the Arctic of emissions of Black Carbon from international shipping.”**

An information document submitted by Norway

**MEPC 67, 13<sup>th</sup> to 17<sup>th</sup> of October 2014.**

The Committee noted that the subcommittee on Pollution, Prevention and Response (PPR 1), in accordance with the work plan agreed at Marine Environment Protection Committee (MEPC 62), considered a definition for Black Carbon from international shipping; measurement methods for Black Carbon; and possible control measures.

The Committee also noted that PPR 1, recalling the instruction of the Committee to prepare one definition for Black Carbon, had concluded, based on the views expressed in plenary, that a Light-absorbing carbon definition should be recommended to the Committee for consideration and endorsement. However, PPR 1 had noted that most delegations had not been in a position to express a preference either for Light-absorbing carbon or equivalent Black Carbon, and some delegations had considered that there was a need for additional information before a final decision could be taken.

Definitions:

Light-Absorbing Carbon (LAC):

*"Black Carbon is defined as light absorbing carbonaceous compounds (LAC), resulting from the incomplete combustion of fuel oil."*

Equivalent Black Carbon (eBC):

*"Black Carbon is defined as equivalent Black Carbon (eBC) derived from optical absorption methods, that utilizes a suitable mass-specific absorption coefficient."*

In the ensuing discussion on the definition of Black Carbon the following comments were, inter alia, made:

- .1 it was premature for the Committee to select one definition of Black Carbon at this session and the matter should be sent back to PPR 2 for further consideration;
- .2 further information may be needed to identify and select one definition only;
- .3 it was important to identify a clear purpose of the definition, for example, to certify the engine, monitor exhaust emissions, etc. in order to facilitate any further consideration of what is an appropriate definition for international shipping.

**Following discussion, the Committee referred some documents to PPR 2 and instructed the Sub-Committee to further consider the matter, under the same terms of reference as given to PPR 1, and to make a clear recommendation for a single definition of Black Carbon to a future session of the Committee, identifying as part of that recommendation why the Committee should consider the recommended definition, as opposed to any other.**

**PPR II, 19<sup>th</sup> – 23<sup>rd</sup> of January 2015.**

Canada submitted a document with a third definition of Black Carbon to PPR II. This definition is referred to as the Bond et al. definition:

“Black Carbon is a distinct type of carbonaceous material, formed only in flames during combustion of carbon-based fuels. It is distinguishable from other forms of carbon and carbon compounds contained in atmospheric aerosol because it has a unique combination of the following physical properties:

- .1 it strongly absorbs visible light with a mass absorption cross section of at least 5 m<sup>2</sup>g<sup>-1</sup> at a wavelength of 550 nm;
- .2 it is refractory; that is, it retains its basic form at very high temperatures, with vaporization temperature near 4000 K;
- .3 it is insoluble in water, in organic solvents including methanol and acetone, and in other components of atmospheric aerosol; and
- .4 it exists as an aggregate of small carbon spherules. “

The working group, having considered the LAC, eBC, and Bond et al. definitions, agreed that the Bond et al. definition incorporates LAC and eBC, and should be recommended for use as the definition of Black Carbon for international shipping, for the primary reason that this definition is measurement method neutral, and further is widely supported by the scientific community.

**The PPR – subcommittee concurred with the proposal from the working group with respect to recommending the Bond et al definition of black carbon to the Marine Environment Protection Committee (MEPC 68).**

**Furthermore, PPR invites member governments and observer organizations to conduct black carbon measurement studies to gain experience with the application of the definition and measurement methods, to enable a comparison of the measurement methods and assess the scale of possible variation in the data collected.**