

ASA S12 Committee on Noise
Working Group (WG) 47 – Underwater Noise Measurement of Ships

Seventh Meeting February 23-25, 2008
Florida Atlantic University (FAU), SeaTech Campus

MINUTES

(Prepared by Michael Bahtiarian)

Feb 23rd

The meeting started at 2pm and adjourned at 5pm. In attendance were Michael Bahtiarian, David Vendittis, Bob Myers, Dick Taddeo and Susan Blaeser. Chair Bahtiarian gave update of standard development. Susan Blaeser added discussion of how the document would be reviewed after leaving the WG-47 committee.

Another thorough review of the Table 1 entries follows until end of the day's meeting. This summarizes the changes and reasons. Measurement uncertainty and repeatability was reviewed, but no changes were suggested. Dick Taddeo suggested that the repeatability value may not be necessary. The value was left in as of this discussion. Broadband Resolution and frequency response was reviewed; no changes to values in table, but entry names were change to be clearer.

Figures 1 and 2 will be changed. Figure 1 which shows the three hydrophone arrangement will become three different diagrams, Figures 1a, 1b, 1c. The figure will denote 3 different commonly used arrangements of hydrophone configuration. 1-a will be with a support boat and hydrophones suspended directly off the boat. 1-b will be with hydrophone bottom anchored and cable running to shore, 1-c will be with independent buoy transmitted data back to a ship. The three arrangements can be for any Grade of measurement.

A short discussion on whether the hydrophone depths (entries in the table are not depths, but angles from the ship to the hydrophones), needed +/- tolerance. After short discussion, all agreed it would not be necessary, but thought that a description should read "Nominal Hydrophone Depth(s)".

The hydrophone depth for Grade C was changed from 15 deg to 30 deg. Committee asked how/when it was changed to 15 deg. Chair believe it was done during Woods Hole meeting (i.e. none of these members attended Woods Hole). Chair believed 15 deg was used to help with water depth requirement. Taddeo and Vendittis believed that it must be 30 degrees, so hydrophone is located in center of cone from ship not near the top where signal is more contaminated by LM affects.

Changed water depths to 3x, 2x, & 1x for Grades, A, B, C, respectively. Further, minimum depth for Grade C was increased to 75 meters to prevent 30 deg hydrophone from touching the bottom. Distance ranging accuracy was changed to Distance ranging uncertainty.

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CPA Position was changed to Acoustic Center Location. Entries were changed to two paragraphs which need to be written in next day or two. After length discussion, sea states were removed as...

Feb 24th

Started meeting at 9am and adjourned at 6pm with same attendees as Feb 23rd. Completed review of Table 1 as discussed below.

Sea States were reviewed again. Everyone acknowledged that there are minimum sea states that the tests can be performed in. The controlling factors are size of the ship to be test and size of the support ship (if any), background noise, equipment to be used and personnel and safety. It was felt that general minimum sea state for each grade was not sufficient to cover all situation. So, in place of sea state limitation a more general wind speed limitation of ≤ 20 knots and additional paragraph to be added.

Auxiliary measurements were reviewed, only change was to correct sound “velocity” profile to sound speed profile. Calibration was reviewed and eventual changes made to “clean up” the calibration requirements.

Separate from the written standard, review time-bandwidth issue which was brought to the attention by Christ deJong. He made note that small ships at fast speeds would not meet time bandwidth. However, this was not found to be case, when you include fact that minimum CPA is greater of 100 meters or 1x ship length. For small ships, say 30 meters, CPA will still be 100 meters which helps increase the DWL and thus allows time-bandwidth to be achieved. Further, it was determined that time-bandwidth and geometry would limit the standard to vessels traveling less than or equal to 50 knots.

Introduction and Forward of the document are option and this would be the place for the “back story”, reasons for creating the standards, who, what, when and why. Chair asked Dick Taddeo to develop this portion.

Came up with new term “Affected Source Level” and “Resulting Signature Source Level”. The latter is term to be used to refer to the final result of the standard (after computation through eqn 9. Dave Venditts to provide definitions of both terms. Affected Source Level is general term for the parameters???

Figures need to be revised, including Figure 3 which has terms wrong in starboard approach.

Many other detailed changes were made, the reason for which were not recorded, but are shown in the Rev 07 of the document.

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Feb 25th

Started meeting at 9:30am and adjourned at 5:30pm with same attendees as Feb 23rd. Continued with discussion of Section 5. The following items were discussed, not list in order.

A new section on sea surface was added to address sea state and weather type conditions without using those terms. The chair stated that such conditions were generally established (i.e. via sea states), but Bob Myers stated that sea state alone was not good determiner of ability to test. Bob provided two paragraphs (now section 5.3 entitle Sea Surface conditions) which provide some background information and recommend wind speed limit alone.

Another section that was added is Section 4.5 Acoustic Center, which discussed the assumption on determining acoustic center. Acoustic center for Grade A & B would be determined after measurement. Typically, this is the point in time at which the overall SPL is the loudest. However, to determine this location SPL vs. Time must be recorded which is not required for Grade C. The acoustic center for Grade C would then be assumed to be halfway between the engine room and the propeller. Definitions were fixed and Table 1 was changed to be consistent.

The Test Sequence section was revised. Detailed discussion on measurement of CPA for all grades was removed to simply text. Background was selected to be measured every day to half day at distance of 2 km.

Changed the Grade A measurement to require six runs (3 each side). This was done to improve statistical averages and is what is used by Navy presently.

In Section 6, the equations were revised to use consistent terms and symbols. “V” for velocity was change to lower case v. “D” for distance was changed to lower case d. Ls were changed to L_p, for sound pressure level (i.e. the measured values) and L_w was changed to L_s (for Level Source) to denote adjusted or normalized source level. The term “Resulting Signature Source Level” (L_s) was used and added to the terms to define the resulting 1/3 octave band data set that would be determined (for each run).

Section 7 was reviewed (written by Dave Vendittis) and some small changes were made to the discussion and to Table 2. Section 8 was reviewed. A list of reporting information was provided by Mae Seto, Christ de Jong and Bob Myers. Bob will integrate the three lists into one off line.

It was decided to remove Section 9, application/guidance for now and such information would be put into a Part 2 of the standard or future informative annex.

The schedule for getting out the standard was discussed. ASA would like to have standard ready for S-12 voted and comment by mid March. This would allow for comments to come back and go back to the committee by the Portland ASA meeting. Chair said he would clean up the document and send out by next Wednesday, March 4th.

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All committee members would have one week to review. Chair would hold a WebEx meeting the following Thursday to address questions. Final suggestions in way of wording in the document would be due one week later.

ATTENDEES

Michael Bahtiarian (Chair), Noise Control Engineering, Inc.
Dr. David Vendittis, (Vice Chair) Florida Atlantic University
Bob Myers, Mantech
Dick Taddeo, NAVSEA
Susan Blaeser, ASA Standards Manager

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AGENDA

Feb 23rd

2:00pm: Start Meeting
Introduction (as necessary)
Status of review process
Game Plan for next two days
Time-Bandwidth Issue (see handout)

4:30pm: Break for evening

Feb 24th

9:00am: Detail Review – Section 1
10:00am: Detail Review – Section 2
11:00am: Detail Review – Section 3
12:00noon: Break for lunch
1:00pm: Detail Review – Section 4
3:00pm: Detail Review – Section 5
5:00pm: Break for Evening
7:00pm: Meet for Dinner (to be announced)

Feb 25th

9:00am: Detail Review – Section 6
11:00am: Detail Review – Section 7
12:00noon: Break for lunch
1:00pm: Detail Review – Section 8
3:00pm: End Meeting, Next Meetings, Next Steps