Task Team on Instrument Standards (TT-INST) Report

SOT – V

May 18 – 22, 2009

TT-INST Members

Robert Luke (TT Chairman, United States)
Graeme Ball (SOT Chairman, Australia)
Julie Fletcher (VOSP Chairperson, New Zealand)
Gustavo Goni (SOOP Chairman, United States)
Rudolf Krockauer (ASAP Chairman, Germany)
Pierre Blouch (E-SURFMAR Program Manager, France)
Yvonne Cook (member in absentia due to transfer of assignments, Canada)
Elizabeth Kent (United Kingdom)
Henry Kleta (Germany)
Sarah North (United Kingdom)
Shawn Smith (United States)
Derrick Snowden (United States)
Scott Woodruff (United States)
Bruce Sumner (Associate Member, HMEI, Switzerland)

Tasks

1. Compile information on existing activities, procedures and practices within JCOMM relating to instrument testing, standardization and inter-calibration, as well as the standardization of observation practices and procedures.

2. Using guidance contained in existing guides including the WMO Guides on Instruments and Methods of Observation (WMO-No.8) communicate with manufactures regarding new technologies and recognized equipment problems.

3. Prepare a JCOMM Technical Report containing this information, to be made widely available through relevant web sites (JCOMM, JCOMMOPS, VOS, DBCP, SOOP, and SOT).

4. Provide guidance on testing and the inter-calibration of marine meteorological and oceanographic observing systems.

5. Liaise closely with WMO/CIMO, both in the compilation of the information and in assessing what additional work in this area might be required under JCOMM.

6. Liaise closely with IOC in the preparation of the wider compilation of existing instrumentation and observing practices standards in oceanographic observations in general, with a view to inputting an appropriate contribution from JCOMM.

7. Conduct an inter-comparison study of electronic logbooks.

8. Review all relevant JCOMM Publications to make sure they are kept up to date and comply with Quality Management terminology;

9. Work with the WMO Commission on Instruments and Methods of Observations for updating the WMO Guide No. 8 section dealing with ship-based observations.

Fielded Equipment Information and Standards

BAROMETERS				
National VOS	**Barometer**	**Barometer Type**	**Barometer Setting**	**Type of Correction Tables Used**
Australia	Vaisala PTB220	Digital	Station Level	Height
Australia		Precision Aneroid	Station Level	Pressure/Temperature, Drift & Height
Croatia	Barigo Fisher SUNDO	Ship's Aneroid Ship's Aneroid Ship's Aneroid	MSL MSL MSL	NIL NIL NIL
Ecuador		Aneroid	MSL	NIL
France	Vaisala PTB220	Digital	Station Level	NIL
Germany	Fuess	15PM	MSL	NIL
Greece	Belfort SUNDO Th. FRIEDRICH	Aneroid Ship's Aneroid Ship's Aneroid	Station Level Station Level Station Level	NIL NIL NIL
Hong Kong		Precision Aneroid Ship's Aneroid	MSL MSL	U.K. Met. O. 740 U.K. Met. O. 740
Iceland	Fuess Vaisala PA11	Ship's Aneroid Digital	MSL MSL	Air Pressure Dependent
Ireland		Ship's Aneroid Aneroid	MSL MSL	NIL NIL
Japan		Aneroid Digital	Station Level Station Level	Height Height
Netherlands	Fuess Vaisala PTB220	Aneroid Aneroid	MSL MSL	NIL NIL
New Zealand	Fuess	Aneroid Precision Aneroid	MSL Station Level	NIL Instrument & Height
Singapore	PAB MK2 M2236		MSL	U.K. Met. O. 740
South Africa	Fuess	Aneroid	MSL	NIL
United Kingdom	Negretti & Zambra PAB MK2 Vaisala PTB220	Precision Aneroid Barometer Digital	Station Level	NIL (for ships using TurboWin) U.K. Met. O. 740 (for ships not using TurboWin)
United States	Belfort Meteograf	Aneroid Digital	MSL MSL	NIL NIL

NOTES: 1) For Ships using TurboWin, the Height correction is applied by the software.
2) Information can also be found on VOS web site at:
http://www.bom.gov.au/jcomm/vos/national_practices_pressure.html

- Only handful of SOT members providing VOS Equipment information.
- Even less for SOOP & ASAP
- Shared information helps in Procurement to Quality Control

Electronic Logbook Inter-Comparison

SOT-IV Action Item # s I-2.1.13 and IV-3.5.7 tasked TT-Inst to conduct a comparison study of electronic logbooks (including algorithms, and documenting the calculation methods of dew point for historical purposes), with participation from both SOT and ETMC.

Dewpoint Calculations between E-Logbooks are to be shared with ETMC for review and recommendation for single standard calculation.

Comparison held between the following E-Logbooks:
TurboWin (Vers. 2.2, 3.6, 4.0)
SEAS (Vers 6.57)
OBSJMA

Objective: The objective of the inter-comparison was to compare the BBXX output from different types and versions of Electronic logbook software in common use, using identical test datasets.

The inter-comparison, as well as comparing the BBXX output, also checked the coding, computational algorithms, and the effectiveness of the in-built quality control mechanisms to reject 'bad' data.

E-Logbook Inter-Comparison Test Datasets

Three sets of metadata and associated test data were created, where each set formed a discrete observation :

•**Observation 1** is a straight forward, basic observation using ‘estimated wind speed and direction’ and MSL pressure.

•**Observation 2** uses ‘measured apparent wind speed and direction’ and station level pressure.

•**Observation 3** uses ‘measured true wind speed and direction’ and a MSL pressure below 1000.0hPa. It also contains some deliberate errors to test the inter-dependency of elements.

Overall Summary of E-Logbook Inter-Comparison

In general - close agreement between the observations output by the 3 E-Logbook types.

•All E-Logbook software types have built in checks and balances.
•All E-Logbook types required the wet bulb to be lower than or equal to dry bulb.
•All E-Logbook types recognized the relationship between present weather and cloud, between cloud amount, type and height, and between tendency code 4 and nil pressure change.

Significant variations between the 3 E-Logbook types are:

•**Dewpoint** – Each of the 3 E-Logbook types produced different dewpoint results indicating the use of different background tables. TurboWin and OBSJMA produced dewpoint to one decimal place, while SEAS only produced dewpoint in whole numbers eg 2011/

•**Calculation of Apparent Wind Speed and Direction to True** – All 3 E-Logbook types produced the same True Wind Direction. The computed True Wind Speed varied by a couple of knots between the logbook types and between versions of TurboWin.

•**Wind Speed Unit** – OBSJMA and SEAS can only output wind speed in knots. TurboWin provides the option of knots or m/s.

•**Calculation of MSL Pressure** - Neither OBSJMA nor SEAS has the ability to calculate MSL pressure, so MSL pressure must be entered.

•**Inter-dependability** - Only OBSJMA recognized the relationship between Wind Speed and Wind Waves, requiring the observer to enter a higher wind wave to match the high wind speed. Only OBSJMA required ship speed to be entered, while SEAS and TurboWin allowed the non-entry of ship speed.

E-Logbook Inter-Comparison –Swell Waves

The Inter-Comparison revealed that the 3 E-logbook types coded swells differently. For example, 'no swell' becomes:

SEAS = an output of 3//// 4//// 5////
OBSJMA omits groups 3, 4 and 5
TurboWin = codes 3000 4//// 5////

There is a need to differentiate between swell not observed (i.e. no data) and no swell (calm sea).

E-Logbook Inter-Comparison Recommendations

TT-Inst proposes six (6) Recommendations:

1.That all E-Logbook software report dewpoint to one decimal place.

2.That the algorithm for calculating dewpoint be standardised between E-Logbooks.

3.Swell coding:

(1) When swell 'not determined' = 3//// 4//// 5////. Recommendation is to omit the 3, 4 and 5 groups in the coded observation.
(2) When 'no swell' i.e. calm sea = 30000 40000 50000. Recommendation is to code 30000 and omit the 4 and 5 groups in the coded observation. By inference, if the 3 group is reported as 30000 then the 4 and 5 groups **must** be 40000 and 50000 respectively, in which case they provide no useful additional information.
(3a) When confused swell (plus confused height and period) = 399/// 4//// 5////. Recommendation is to omit the 5 group in the coded observation.
(3b) When confused swell (height and period estimated) = 399// 4xxxx 5////. Recommendation is to omit the 5 group in the coded observation. Note: x = valid data
(4) Coding of 1 swell = 3xx// 4xxxx 5////. Recommendation is to omit the 5 group in the coded observation. Note: x = valid data
(5) Coding 2 swells = 3xxxx 4xxxx 5xxxx. Recommendation is to code all groups. Note: x = valid data

E-Logbook Inter-Comparison Recommendations

4.That TurboWin and SEAS software implement a QC check to correlate the reported wind speed with wind wave height.

5.That all E-Logbook software provide more on-screen information to aid in the selection of the correct code figures for Visibility (VV) and Height of base of lowest cloud (h) when the ranges and heights are at the boundaries of the levels. Refer to WMO manual on Codes (WMO No 306) FM13-XII Ext. SHIP. For VV refer to WMO code table 4377 and note that if the distance of visibility is between two of the distances given, the code figure for the smaller distance shall be reported. For h refer to WMO code table 1600 and note that a height exactly equal to one of the values at the ends of the ranges shall be coded in the higher range.

6.That SEAS and TurboWin prompt for the entry of ship speed if it is not entered.

ISO 10596 Update Review

Nov 12, 2008 - TT-Inst contacted by WMO (Charpentier)

- Section 4.B of a WMO-ISO agreement
- coordinated effort between SOT and ISO be established to develop a joint standard for marine wind vanes and anemometers.

- Discussions established between TT-Inst and JCOMM focal point on WMO 's Commission for Instruments and Methods of Observation (CIMO) matters.

ISO 10596 Review Objective and Inter-Comparison

Objective
The objective of the SOT-TT and CIMO efforts were to ensure that the marine observing community and equipment quality standards were maintained as per the WMO No. 8 Publication.

Inter-Comparison
CIMO Chair (Dr. Chung-Chu Teng, NOAA, National Data Buoy Center) and the TT- Inst Chair (Robert Luke, NOAA, National Data Buoy Center) reviewed ISO Proposed Report.

Numerous items did not match with the WMO No. 8 even though the ISO 10596 used the WMO No. 8 as one of its main references.

ISO 10596 / WMO No. 8 Discrepancies

ISO 10586 Section 7 - Performance and Accuracy Requirements

ISO Table 1 — Measurement ranges and minimum measurement units for a wind vane/anemometer

	Measurement range	Minimum measurement unit
Wind speed	2 m/s to **60 m/s** or more	0.5 m/s or less
Wind direction	0° to 359°	**10°** or less

WMO No. 8 — Measurement ranges to 75 m/s and minimum measurement units of 01°

TT-Inst ISO 10596 Recommendations

1. That the WMO Secretariat contact the ISO TC 8/SC 6 group and request the following:

   1) These proposed changes be reviewed by TC 8/SC 6 for possible inclusion into the ISO 10596.

   2) Ensure that the changes to Section 7 are incorporated into ISO 10596 or proper response provided to the WMO Secretariat and SOT as to why the variance of WMO No. 8 Requirements cannot be implemented.

   3) A proper revision of ISO10596 is promulgated for review and publication within normal WMO/ISO channels.

2. That the SOT national focal points coordinate nationally with their ISO/TC or SC representative to ensure CIMO Proposed changes are incorporated.

TT – Instruments Report Proposed SOT Actions

The meeting is invited to …

•Consider the information contained in this report concerning the current status of the Instrument Standards Task Team (TT-Inst.).

•Consider the recommendations from the Task Team concerning the Electronic Logbook inter-comparison .

•Consider the recommendations from the Task Team concerning the ISO 10596 changes.

•Encourage members to continue to update their equipment information and Instrumentation standards (including Automated Weather Stations (AWS)) to the TT-Inst.

•Official Replacement of Yvonne Cook with Gerie-Lynn Lavigne (Environment Canada).

•Revise the Task Teams Terms of Reference, as necessary, to reflect the proposed changes to the project.