APPENDIX F
REPORT BY THE TASK TEAM ON INSTRUMENT STANDARDS

1. INTRODUCTION

1.1. The third meeting of the Ship Observations Team (SOT-III) established this task team to complete the following efforts:
- 1.1.1. Compile information on existing activities, procedures and practices within JCOMM relating to instrument testing, standardization and intercalibration, as well as the standardization of observation practices and procedures.
- 1.1.2. Using guidance contained in existing guides including the WMO Guides on Instruments and Methods of Observation (WMO-No.8) communicate with manufacturers regarding new technologies and recognized equipment problems.
- 1.1.3. Prepare a JCOMM Technical Report containing this information, to be made widely available through relevant web sites (JCOMM, JCOMMOPS, VOS, DBCP, SOOP, SOT).
- 1.1.4. Provide guidance on testing and the intercalibration of marine meteorological and oceanographic observing systems.
- 1.1.5. Liaise closely with WMO/CIMO, both in the compilation of the information and also in assessing what additional work in this are might be required under JCOMM.
- 1.1.6. Liaise closely with IOC in the preparation of the wider compilation of existing instrumentation and observing practices and standards in oceanographic observations in general, with a view to inputting an appropriate contribution from JCOMM.

1.2. This task team encompasses the Voluntary Observing Ship (VOS), Ship of Opportunity (SOOP), and Automated Shipboard Aerological (ASAP) programs. Other sub functions may be included as per guidance from the SOT governing body.

1.3. As of SOT-IV, the Task team is in the process of collating information about national guidance material and instrument types that will be available for posting on the specific SOT panel web sites.

2. GUIDANCE

2.1. VOS
- 2.1.1. WMO
  - 2.1.1.1. Guide To Meteorological Instruments And Methods of Observation (WMO-No. 8)
- 2.1.2. NMS
  - 2.1.2.1. Australia
    - 2.1.2.1.1. Port Meteorological Agents Guide
    - 2.1.2.1.2. TurboWin User Guide
    - 2.1.2.1.3. TurboWin Setup Manual
  - 2.1.2.2. United Kingdom
    - 2.1.2.2.1. UK Met O.740
  - 2.1.2.3. United States of America
    - 2.1.2.3.1. Military Specification MIL-B-17089
    - 2.1.2.3.2. National Weather Service NWS G101 – SP004
    - 2.1.2.3.3. National Weather Service NWS G222 – SP002
    - 2.1.2.3.4. NWS Instruction 10-201
    - 2.1.2.3.5. AmverSeas Users Manual
    - 2.1.2.3.6. Observing Handbook No. 1

2.2. SOOP
- 2.2.1. IOC
  - 2.2.1.1. Guide to IGOSS (now JCOMM) Data Archives and Exchange (BATHY and TESAC) - IOC Manual and Guides No.1
  - 2.2.1.2. Guide to Operational Procedures for the Collection and Exchange of IGOSS (now JCOMM) Data - IOC Manual and Guides No.3

2.2.1.3. IGOSS (now JCOMM) Plan and Implementation Programme - IOC Technical Series No. 43

2.2.1.4. Best Guide And Principles Manual For The Ships Of Opportunity Program (SOOP) and Expendable Bathythermograph (Xbt) Operations

2.2.2. NMS

2.2.2.1. Australia

2.2.2.1.1. Devil XBT User Manual

2.3. ASAP

2.3.1. WMO

2.3.1.1. No guidance available at this time.

2.3.2. EUCOS

2.3.2.1. No guidance available at this time.

2.3.3. NMS

2.3.3.1. No guidance available at this time.

3. CURRENTLY FIELDED EQUIPMENT

3.1. VOS

3.1.1. Barometers

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	Aneroïd Aneroïd	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	PAB MK2 Negretti & Zambra Precision Aneroid Mk 2	Aneroid Aneroid Aneroid	Station Level MSL	U.K. Met. O. 740 NIL
United States	Belfort	Aneroid	MSL	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

3.1.2. Barographs

BAROGRAPHS			
National VOS	**Barograph**	**Barograph Type**	**Barograph Setting**
Australia		Open Scale	Station Level
Croatia	KOMPAS	Open Scale	MSL
Ecuador		Micro-barograph	MSL
France	None		
Germany	Mueller 78A Lambrecht 290		MSL MSL
Greece	Belfort	Open Scale (4 Day)	Station Level
Hong Kong		Small Scale	MSL

Iceland	None		
Ireland		Open Scale (7 Day)	MSL
Japan		Open Scale (1 Day) Open Scale (7 Day)	Station Level Station Level
Netherlands	Fuess	Aneroïd	MSL
New Zealand		Open Scale	MSL
Singapore		Open Scale MK3	MSL
South Africa	Mason		MSL
United Kingdom		Open Scale (7 Day)	MSL
United States	Belfort	Open Scale (4 Day)	MSL

3.1.3. Thermometers

VOS THERMOMETER TYPES and SETTINGS			
National VOS	**Thermometer**	**ThermometerType**	**Thermometer Fluid**
Australia	AMA	Liquid-in-glass	Hg
Netherlands	Ship provided		
United kingdom	Zeal 2C		Hg
United States	Zeal P2505	Mason Hygrometer	Glycol

3.1.4. Sea Surface Temperature

VOS SEA SURFACE TEMPERATURE TYPES and SETTINGS			
National VOS	**Sensor**	**Sensor Type**	**Sensor Scale C/F**
Australia	Sea thermometer	Ship's intake Bucket (UK)	C C
Netherlands		Bucket	Alcohol or Mercury Deg C
United Kingdom	Sea thermometer	Bucket Ship's intake	C C
United States		Ship's Intake	Either (ship Dependent)

3.1.5. Automated Systems

VOS AUTOMATED SYSTEMS			
National VOS	**Sensor**	**Communication**	**Augmentable**
Australia	ShipAWS	Inmarsat-C Data Reporting	Yes
Canada	AVOS	Inmarsat-C Text	Yes
Denmark	BATOS	Inmarsat-C Data Reporting	Yes
EUCOS	BATOS	Inmarsat-C Data Reporting	Yes
France	BATOS BATOS MINI-BATOS MINOS	Inmarsat-C Data Reporting Inmarsat-C Text Inmarsat-C Text Argos	Yes Yes No No
Germany	Ship's datalogger Vaisala MILOS-500	Meteosat Meteosat	 Yes
Ireland	Vaisala MILOS-500	Inmarsat-C Text	No
New Zealand	Sutron 9000RTU	MTSAT	Yes
Norway	QLC-50	VSAT	??
Spain	Vaisala MILOS-500	Inmarsat-C Text	No
United Kingdom	AVOS BATOS CMR Automet MINOS	Inmarsat-C Text Inmarsat-C Text Inmarsat-C Text Argos	Yes Yes No No
NOTE: More detail information regarding automated systems is covered under SOT-III Action Items III-A/3.2.1 and III-A/3.2.4.			

3.2. SOOP

3.2.1. Expendable BathyThermograph (XBT)

XBT Probe	
National SOOP	**Equipment Type**
Australia	Sippican
United States	Sippican

3.2.2. XBT Recorder System

XBT Recorder	
National SOOP	**Equipment Type**
Australia- BOM	Devil XBT
Australia- CSIROS	Devil XBT

3.2.3. ThermoSalinoGraph (TSG)

Thermosalinograph (TSG)	
National SOOP	**Equipment Type**
United States	Seabird 21 TSG Seabird 38 Remote Temperature Sensor Seabird 45 MicroTSG

3.2.4. Conductivity, Temperature, and Depth (CTD)

Conductivity, Temperature, and Depth (CTD)	
National SOOP	**Equipment Type**
United States	Seabird 19 Seabird 25 Seabird 911+

3.2.5. Expandable Conductivity, Temperature, and Depth (XCTD)

Expandable Conductivity, Temperature, and Depth (XCTD)	
National SOOP	**Equipment Type**
United States	Sippican TSK

3.2.6. Acoustic Doppler Current Profile (ADCP)

Acoustic Doppler Current Profile (ADCP)	
National SOOP	**Equipment Type**
United States	RD Instruments

3.2.7. Partial Pressure of CO_2 (pCO_2)

Partial Pressure of CO2 (pCO2)	
National SOOP	**Equipment Type**
Australia	CSIRO
United States	General Oceanics

3.2.8. Moving Vessel Profiler

Moving Vessel Profiler	
National SOOP	**Equipment Type**
United States	Brooke
United States	Scripps

3.3. ASAP

ASAP TYPES and COMMUNICATIONS			
National ASAP	**CONTAINER**	**SOUNDING EQUIPMENT**	**SATELLITE TRANSCEIVER**
Denmark	10ft Container	MW12	
E-ASAP	10ft container 10ft container	MW21, version 2.17, Win2k MW21, version 2.17, WinNT	T&T 3026L/M T&T 3020-C
France	Deck launcher	MODEM SR2K	
Germany	20ft container 20ft container 20ft container 20ft container	MW21, version 1.26, WinNT MW21, version 2.17, Win2k MW21, version 2.17, WinNT MW21, version 2.17, WinNT	T&T 3020-C T&T 3020-C T&T 3020-C T&T 3020-C
Spain	10ft container	MW21, version 2.17, WinNT	T&T 3022?
Sweden	10ft container	MW21, version 2.17, Win2k	TT 3022D
United Kingdom	10ft Container	MW21, version 2.17, Win2k	

4. TESTING PROCEDURES AND PRACTICES

4.1. VOS

4.1.1. WMO

4.1.1.1. SOT-III Action Item III-A/2.3.2 Post calibration practices on VOS web site

4.1.2. NMS

4.1.2.1. United States

4.1.2.1.1. Barometer – Refer to section 3.6 of NWS G101 – SP004

4.1.2.1.2. Barograph – Refer to section 4.2 of NWS G222 – SP002

4.2. SOOP

4.2.1. Extensive testing and evaluation is completed and available on SOOP website at: http://www.brest.ird.fr/soopip/

4.3. ASAP

4.3.1. Not available at this time

5. INTERCALIBRATION COMPARABILITY

5.1. VOS

5.1.1. NMS

5.1.1.1. United States

5.1.1.1.1. Comparison testing between Belfort Aneroid barometers/barographs and KNMI Fuess barometer/barographs were completed (May2006) with negative results (sent to KNMI)

5.2. SOOP

5.2.1. Extensive testing and evaluation is completed and available on SOOP website at:

http://www.brest.ird.fr/soopip/

5.3. ASAP

5.3.1. Not available at this time.

6. WHAT's NEXT?

6.1. More NMS support

6.1.1. Review of TT Report and update input specifications.

6.1.2. Report previous intercalibration findings.

6.1.3. Develop new intercalibration studies.