Major changes in AMVERSEAS V 9.0 compared to the previous version

The AMVERSEAS applications system was upgraded. It consists to replace the existing product with a new version able to respond current hardware and software requirements. All new recommended features make the work more efficient and easier, improve the software design, reduce software complexity, reduce software maintenance costs, increase software understandability, increase software productivity, and make easier future changes.

The new AMVERSEAS was designed allowing the user to install the components that he/she requires. It includes following applications:

SEAS Console: Interface application to manage the AMVERSEAS programs' activities.
SEAS Transceiver Interface: Real-time application which combines reception of GPS data and transmission of collected data via several devices.
SEAS TSG Data Recorder: Real-time application to collect thermosalinograph data.
SEAS XBT Data Recorder: Real-time application which obtains information on the temperature structure of the ocean to depths of up to 2000 meters.
SEAS Met Observations Logger: Manual component that provides accurate meteorological and oceanographic data in real time from ships at sea.
SEAS AutoIMET Data Logger: Real-time application to produce automatically high quality marine weather observations. It connects to a Remote Computer System using sockets to retrieve a data stream containing the measured weather parameters.
AMVER Reporter: Submit four types of reports used by the U.S. Coast Guard to update their data base for search and rescue operations.
SEAS PC-Watchdog: to monitor the proper operation of the AMVERSEAS components. It is designed to keep the applications running continuously.

AMVERSEAS system

- Introducing the .INI File concept. These are plain-text files that contain configuration information. It will be use to save applications information about preferences and operating environment.
- The serial port communication was improved using events handle to increase the performance, this means that there are not delays, and the application knows when the data arrived. As result the serial communication is more efficient, robust, and scalable.
- New directories structure.
- Adding databases to store data and settings. This feature will increase the abstraction level of the applications allowing remove hard coded text messages in the program code. Also it will make the system more robust eliminating some critical and very sensible to be changed text files.
- Log files improvement. All applications generate two log files, the Debug and Error files to track possible errors.
- Implementing the new AMVERSEAS file name convention: CallSign_TimeStamp_[ExtraInfo_]DataType.ext
- Distributing a new version under Windows 7.

- Implementing new feature that should help to identify exactly which version is running. This is the **Revision date** field in the application's About dialog.
  The format is YY.MM.DD.HH.MM = Year.Month.Day.Hour.Minute
  This field will be updated each time that a new version is built.

SEAS Console

- Adding the utility Date and Time: Set the date, time, and time zone for SEAS computer [Main menu|Utilities|Date and Time].
- Displaying XBT mapped profiles [Main menu|Utilities|Display mapped profiles].
- Remote command system: This allows users to send commands from a remote platform via email using the Iridium SMS service [Main menu|Setup|Remote command system].
  Commands:

  REBOOT - Shuts down and restarts the system. It sends a message to all applications to determine if they can be terminated.
- From the main screen, link to the AMVERSEAS website.

SEAS Transceiver Interface

- Reading GPS data from a remote computer via socket [Receiver tab].
- Files transmission to an ftp server using Iridium and/or Internet connection [Transmitter tab].
- Incorporating data quality control to ensure the best possible GPS data is collected applying two methods, inspecting for errors taking out the garbage, and analyzing for precision supplementing the GPS data with other information.

  Inspecting for errors taking out the garbage: (Sentence's format: $GPRMC,205038,A,3805.5597,N,12253.9864,W,20.0,97.3,301009,6,W*62). A checksum will be calculated as the XOR of bytes between (but not including) the dollar sign and asterisk. This checksum is then compared with the checksum from the sentence. If the checksums do not match, the sentence is typically discarded. This is okay to do because the GPS devices tend to repeat the same information every few seconds. With the ability to compare checksums, the decoder is able to throw out any sentence with an invalid checksum.

  Analyzing for precision supplementing the GPS data with other information: The GPRMC sentence, known as the "Recommended Minimum" sentence, is the most common sentence transmitted by GPS devices. This one sentence contains nearly everything the application needs. To improve the data's quality the application will have to check the nature of the fix extracting this information from any other received sentence.

SEAS TSG Data Recorder

- Reading calibration coefficients automatically from SBE 45 MicroTSG, and SBE 38 remote temperature sensor.

- Automatic communication test; tests if the application is able to communicate with different instruments, and displays the configuration [Main menu|Tool|Comunication test].
- Automatic baud rate detection; changes the baud rate in the SBE 45 and/or SBE 38 for compatibility with the Interface Box. This automatic detection is useful for establishing communication between the instruments [Main menu|Tool|Auto baud rate detection].
- Setting instruments default configuration automatically [Main menu|Tool|Set instruments default config].
- Reading GPS data from a remote computer via socket [Main screen].
- Automatic diagnosis sending SMS message via Iridium to an email account: When the application detects fails in transmission process it sends a SMS to a predefined email address [Main menu|Setup|Remote command settings].
- Topic-oriented online help delivered with the application to give assistance to the user [Main menu|Help|Help Topics].
- Recording raw data as backup.

SEAS XBT Data Recorder

- Including in SEAS profiles the information about transect number, and sequential number for profiles.

Meteorological Observations (SEAS Met Observation Logger and SEAS AutoIMET Data Logger)

- SOT Task Team recommended improvements. These recommendations are the result from an inter comparison of the three international used Electronic Logbooks (see 11504-10-OBS-WIGOS-OSD-MAR-SOT.pdf).
- Generating IMMT-IV formatted message to support the VOSClim program.
  Windows XP: C:\Documents and Settings\All Users\Application Data\AMVERSEAS_V9\Archive\ArchiveMet\IMMT.txt
  Windows 7: C:\ProgramData\AMVERSEAS_V9\Archive\ArchiveMet\IMMT.txt
- Supported Minimum Quality Control Standards MQCS-VI.
- Standardization of the algorithm for the computation of dew point temperature. All used formulas and algorithm to calculate the dew point are taken from WMO-No.8, 7th edition, 2008, Part I, Annex 4.b.
- Met Observation Logger: Adding recruiting country 'Not Assigned' in order to the ancillary pilot project [Main menu|Setup|Meta data|Ship details table|Country which has recruited the ship|Not assigned and Main menu|Setup|Meta data|Observing table|Observations platform|Ancillary Pilot Project].
- Met Observation Logger: Adding the option to send meteorological observations automatically via email to an SMTP for delivery or using the default email client installed on the computer. The user doesn't have to go through the old antiquated process of copy the observation, and paste it in the body of the email [Main menu|Setup|E-mail settings and SEAS Console-Main menu|Setup|Outgoing server (SMTP) settings].
- Met Observation Logger: Generating Meta data report.
  Windows XP: C:\Documents and Settings\All Users\Application Data\AMVERSEAS_V9\Archive\ArchiveMet\MetaData.txt
  Windows 7: C:\ProgramData\AMVERSEAS_V9\Archive\ArchiveMet\MetaData.txt

- Met Observation Logger: Incorporating the capability to transmit the meta-data in binary format.
- Met Observation Logger: Adding command to display, edit and/or print the entry data for the currently observation as report. This command allows instant access to edit measured values clicking the button below each edit field. This will take the user to the dialog associated with that value in the Met Observations Wizard [Main menu|Observation|Output|Show report].
- Topic-oriented online help delivered with the application to give assistance to the user [Main menu|Help|Help Topics].
- Adding brochures and user's guide [Main menu|Info].
- Increasing data accuracy implementing extensive error check.

AMVER Reporter

- Entering departure (destination) port and populate automatically the latitude and longitude fields in the Sailing Plan dialog. In order to enter the departure (destination) port's latitude and longitude values the user can press the button 'Search departure port by name' ('Search destination port by name') to start a search. The selection retrieves a list of ports matching the pattern entered in the input field 'Port'. It is not necessary to enter the whole port's name.
- Incorporating a SQLite database containing the list of seaports so users will be able to easily search.

SEAS PC-Watchdog

- The user cans choice between software or hardware automatic reset. The hardware reset will be executed using the **External PC Serial Watchdog** device of **Berkshire Products, Inc**. (External Serial PC Watchdog Manual), just the same as if the reset button was pushed.

High quality documentation

AMVERSEAS Installation Guide.
AMVERSEAS Setup Guide.
How to install and setup the SMTP mailer service.
Starting SCS.

SEAS Console User Guide.
SEAS Met Observations Logger User Guide.
SEAS AutoIMET Data Logger User Guide.
SEAS TSG Data Recorder User Guide.
SEAS PC Watchdog User Guide.