**Design considerations for VDES**

This document is a compilation of ideas expressed at WG3+4 intersessional meeting in Sait Germain en Laye 14.03.31-14.04.04 and amended at ENAV 15, 16th October 2014

Assuming Channel Plan A

**1.) VDES Requirements:**

* Shall protect AIS integrity for collision avoidance and identification purposes;
  + Consider scheduled AIS transmissions
  + Consider slot selection rules of AIS to avoid the loss of near targets on AIS
  + Similar service area as AIS (power 12.5 W, sensitivity)
* The duty cycle of any given transmission shall respect AIS and voice comms;
  + Limit length of ASM and VDE transmissions
  + Limit amount of ASM and VDE transmissions per minute (mobile, base station),  
    maybe adapted dynamically depending on channel load
* The transition period between having a VDES service and capabilities available on ships shall be carefully considered;
  + Existing AIS equipment may not receive on ASM and VDE
  + interference with current VHF voice communications

There will be a transition period where ASMs will be on AIS and/or ASM;

**2.) ASM Requirements**

ASM Channels shall, to the extent that is practical, support all application specific message (ASM) formats:

* Shall protect AIS integrity for collision avoidance and identification purposes;
* Shall protect AIS integrity for shore side monitoring and control purposes (cargo type, etc.);
* The duty cycle of any given ASM transmission must respect AIS and voice comms, and if practical VDE;
* The ASM modulation may be variant on a per slot basis; (one modulation scheme for ASM only)
* The ASM shall use an efficient modulation scheme, not necessarily GMSK;
* The ASM shall provide a robust link, e.g. FEC;
* The ASM shall support differentiated priority of message transmissions as described in the GMDSS;
* All ASM transmissions must have a unique identity (MMSI, MAC, etc.);
* The ASM should maximize, to the extent that is practical, satellite reception; (e.g. FEC)
* The ASM channels do not need to duplicate transmissions on both channels, two independent data channels;
* It shall be possible to manage the capacity and use of the ASM channels from shore side;
  + Set limits for amount of ASM messages per ASM channel per unit,
  + Different limits for different ASM 1 and ASM 2
  + Allow for reservation of slots
* The ASM link shall support a maximum control range of TBD with considerations for authentication;
* The ASM link may support at a minimum line of sight communications;
* Synchronisation: either UTC direct or derived from received AIS messages.

**3.) VDERequirements** :

* The VDE shall support differentiated priority of message transmissions as described in the GMDSS;
* The VDE shall provide a robust link, e.g. FEC;
* The VDE medium access schemes and waveform may include multiple modulation and encoding schemes as dictated by the link requirements;
* The VDE shore side may support full duplex operation;
* The VDE shall support semi duplex operation;
* The VDE shall support a satellite sharing scheme (freq. and/or time);
* The VDE transmissions shall have a unique identity;
* The duty cycle of any given VDE transmission shall respect AIS, ASM, and voice comms;
* It shall be possible to manage the capacity and use of the VDE channels from shore side;
* The VDE link shall support a maximum control range of TBD with considerations for authentication;
* The VDE link may support a minimum terrestrial service range within line of sight at a lower quality of service;