

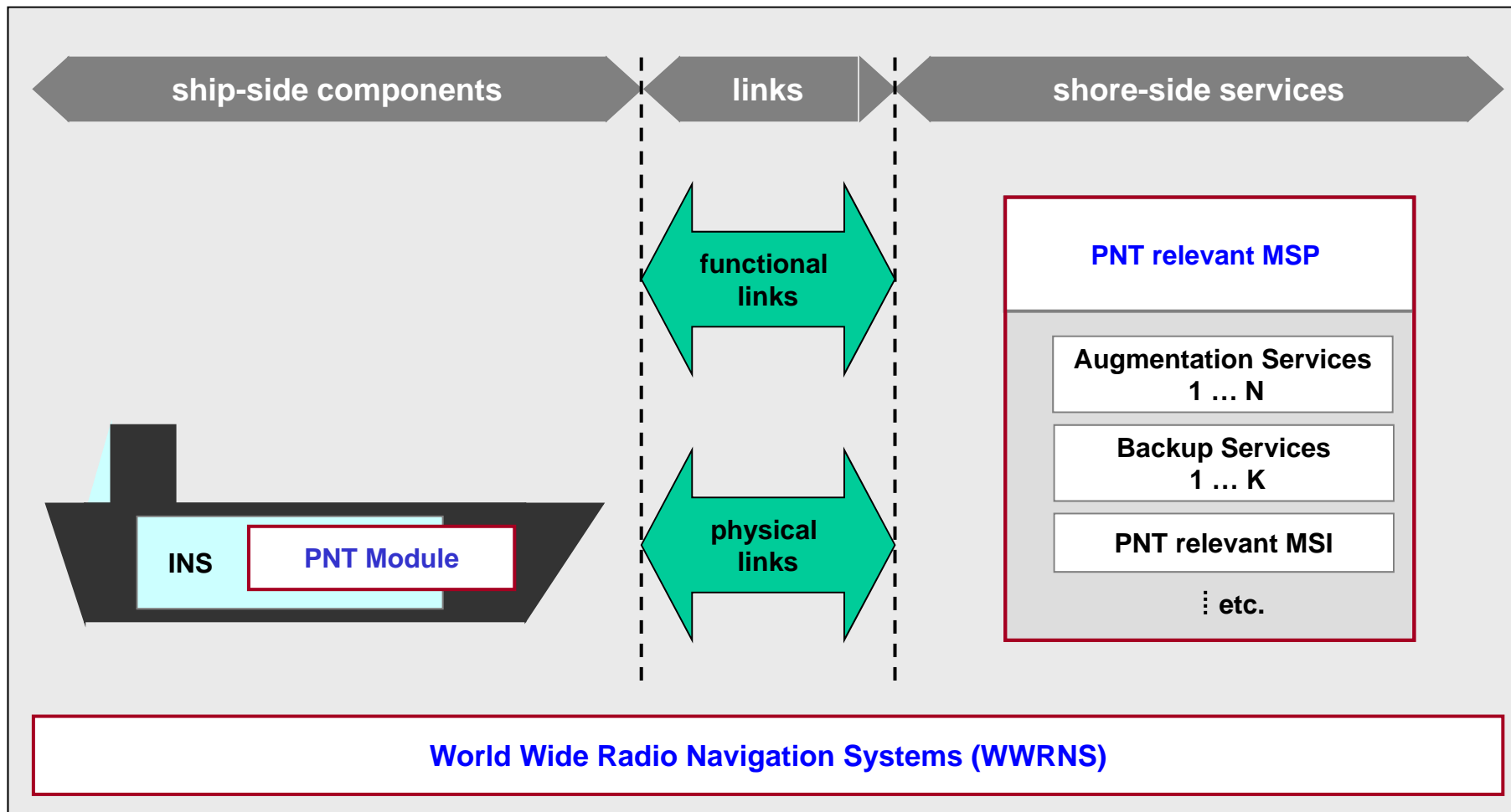
Resilient Position, Navigation and Timing (PNT) Unit as part of the maritime Integrated Navigation System (INS)

From the classic shipboard sensor approach to a modular and scalable PNT Unit approach

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PNT System

Generic Architecture





Technical Requirements on PNT

Consolidated technical specification of user needs

Reliability should be **measurable** and **scalable**!

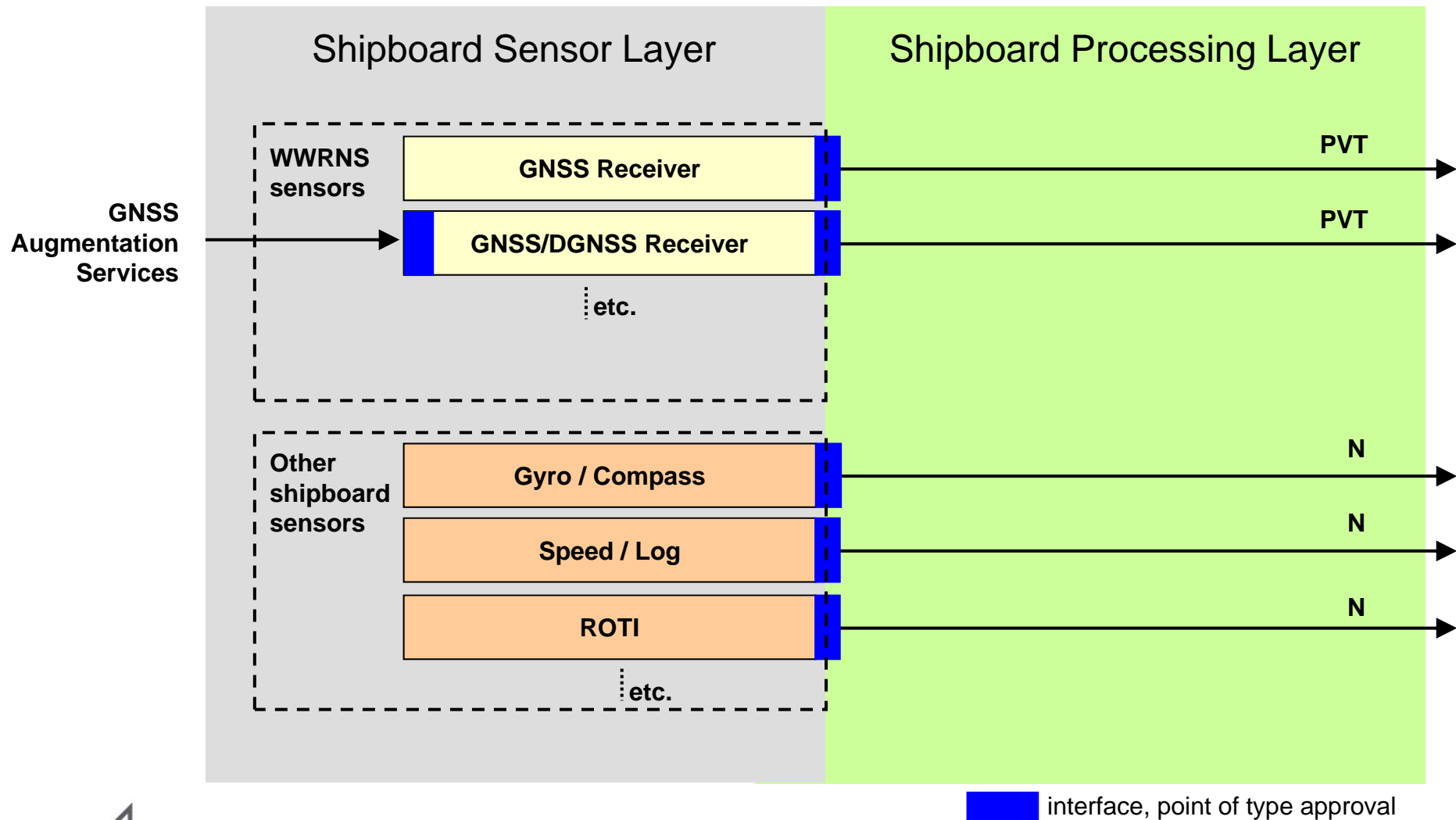
IMO MSC.233(83) intends the application of **RAIM** to assess the GNSS based provision of PVT data.

The INS (IMO MSC.252(83); IEC 61924) applies **plausibility and consistency checks** to assess the PNT data provided by several ship-side sensors.

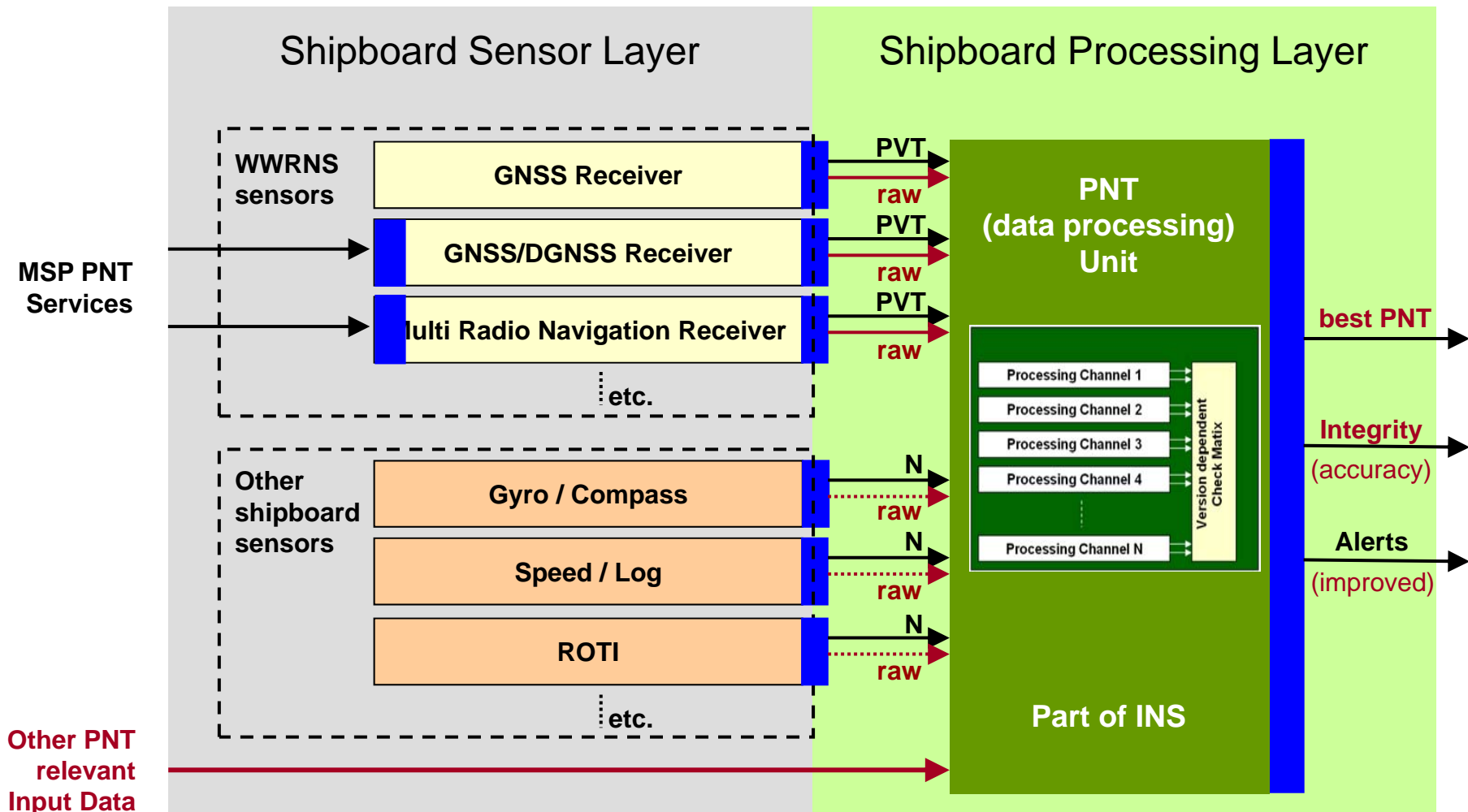
IMO A.915(22) specifies **minimum requirements** on horizontal position data given in unambiguous **terms of accuracy, integrity, continuity and availability**.

- Harmonized meaning of integrity information
- Management of integrity within systems operating with distributed components and services
- Equivalent specifications for other navigational data (e.g. SOG, STW, ROT, Heading, ...)
- Crossover from minimum to scalable requirements (accuracy, integrity) by consideration of specific tasks and their temporal and spatial dependencies

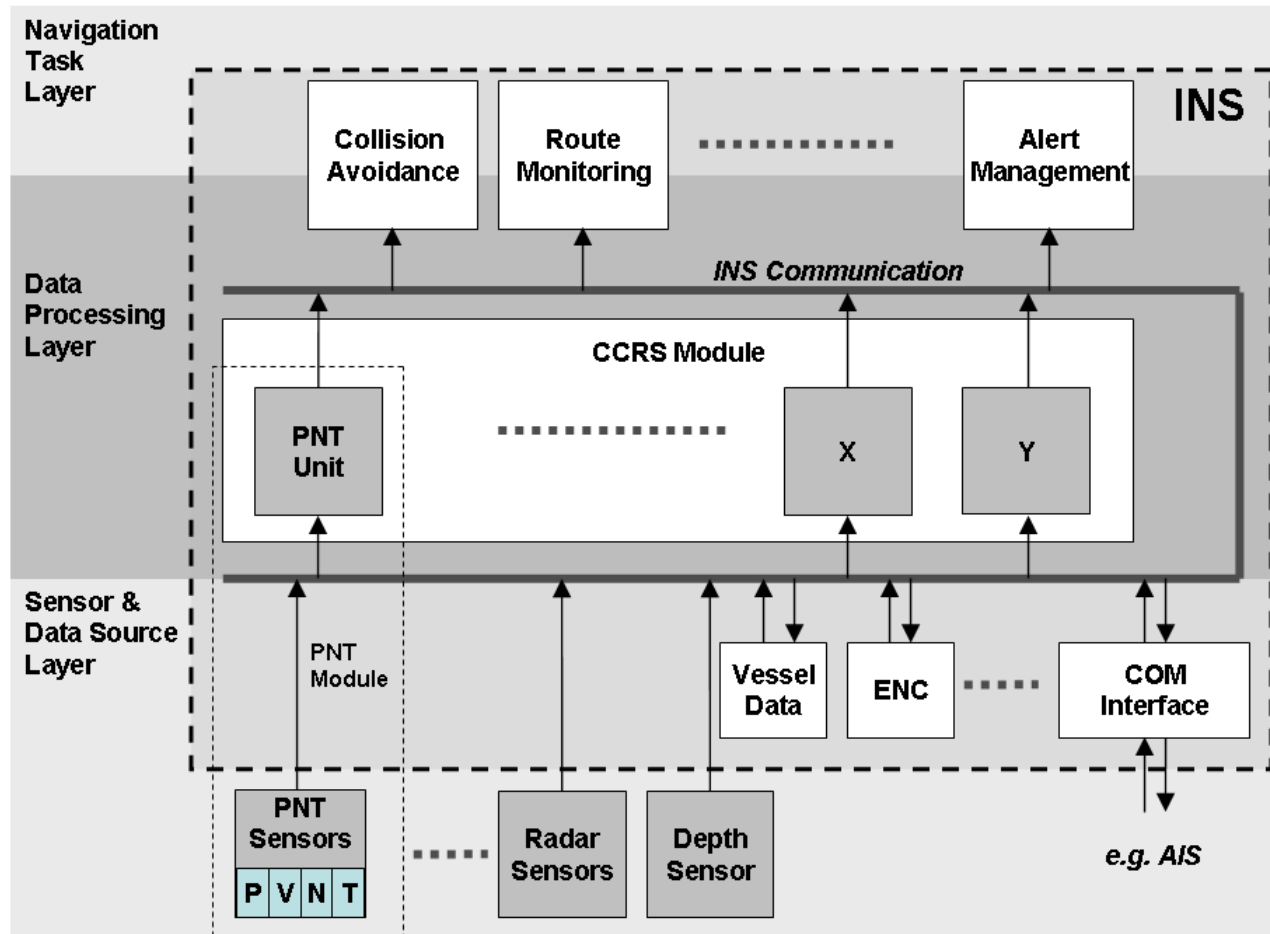
Classic Shipboard Sensor Approach



Modular and scalable PNT Unit Approach



Implementation Approach into INS



Thanks for your Attention

