



TRB Transport Research Board of the National Academies

Marine Board Fall Meeting

National Academy of Science Building, Washington, D.C.

Industry Perspective

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AFRIN



Royal Institute of Navigation
Science Technology Practice

President **CIRM**

Director Maritime Industry



18 November 2013

E-Navigation

is a journey,
not a destiny....



Data versus Information

An Aviation Example

2/1257 PART 1 OF 5 FLIGHT RESTRICTION WASHINGTON, DC. PURSUANT TO SPECIAL FEDERAL AVIATION REGULATION 94, ENHANCED SECURITY PROCEDURES FOR OPERATIONS AT CERTAIN AIRPORTS IN THE WASHINGTON D.C. METROPOLITAN AREA SPECIAL FLIGHT RULES AREA, THE FOLLOWING PROCEDURES ARE EFFECTIVE IMMEDIATELY UNTIL FURTHER NOTICE. EXCEPT FOR DOD, LAW ENFORCEMENT, OR AEROMEDICAL FLIGHT OPERATIONS, ALL PERSONS OPERATING AN AIRCRAFT TO OR FROM THE COLLEGE PARK AIRPORT (CGS); POTOMAC AIRFIELD (VKX); OR WASHINGTON EXECUTIVE/HYDE FIELD (W32), LOCATED WITHIN THE AIRSPACE DESIGNATED AS THE WASHINGTON D.C. METROPOLITAN SPECIAL FLIGHT RULES AREA MUST ABIDE BY THE FOLLOWING OPERATING REQUIREMENTS AND ANY ADDITIONAL PROCEDURES SPECIFIED BY THE ADMINISTRATOR AS NECESSARY TO PROVIDE FOR THE SECURITY OF AIRCRAFT OPERATIONS TO OR FROM THE AIRPORT. OPERATING REQUIREMENTS: NO PERSON MAY OPERATE AN AIRCRAFT TO OR FROM THE ABOVE INDICATED AIRPORTS UNLESS SECURITY PROCEDURES THAT MEET THE PROVISIONS OF PARAGRAPH 4 OF SFAR 94 HAVE BEEN APPROVED BY THE ADMINISTRATOR FOR OPERATIONS AT THAT AIRPORT. **END PART 1 OF 5 WIE UNTIL UFN**

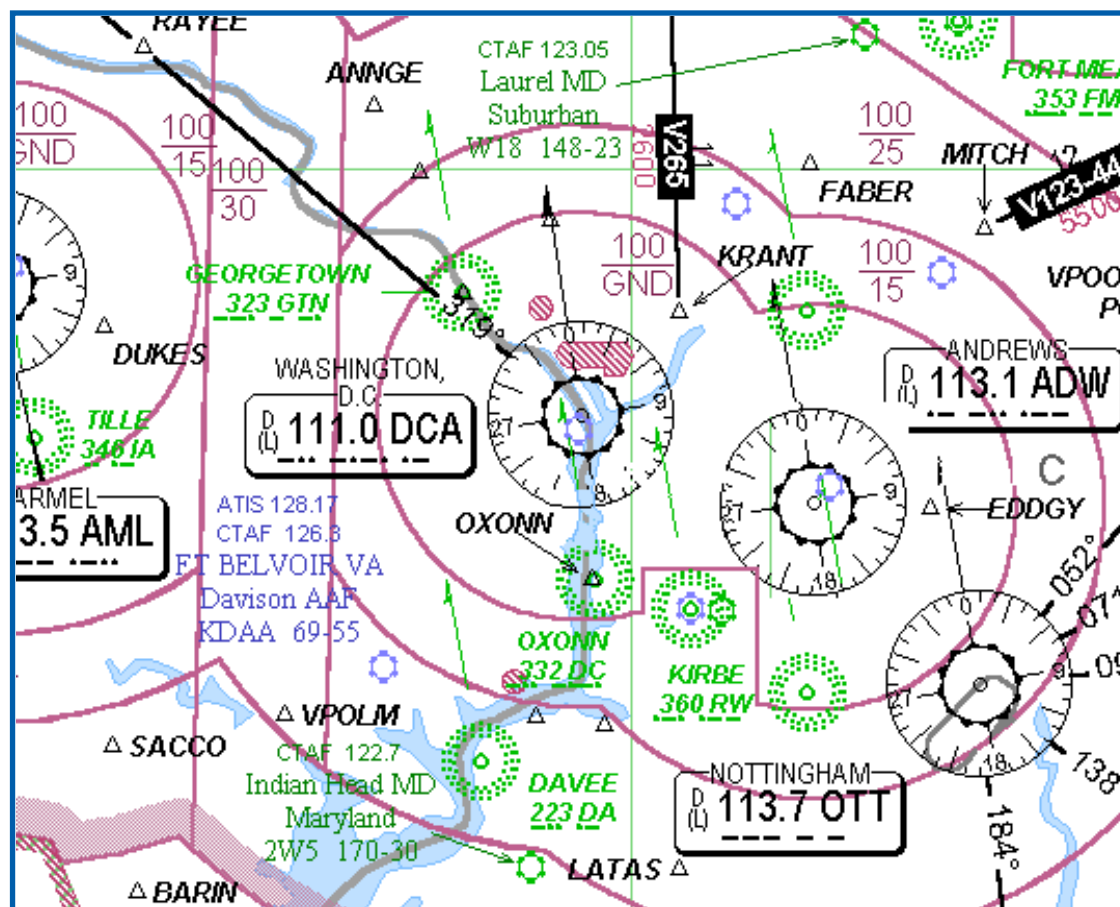
2/1257 PART 2 OF 5 FLIGHT RESTRICTION WASHINGTON, DC. AIR TRAFFIC PROCEDURES: 1. ONLY AIRCRAFT BASED AT THE AIRPORT OF OPERATION IS ALLOWED TO FLY INTO AND OUT OF THAT AIRPORT. EACH PILOT SHALL COMPLY WITH THE FOLLOWING: A) FOR ALL ARRIVALS AND DEPARTURES, FILE EITHER AN IFR OR VFR FLIGHT PLAN WITH LEESBURG AUTOMATED FLIGHT SERVICE STATION (AFSS), VIA TELEPHONE AT 866-225-7410. A SEPARATE FLIGHT PLAN IS REQUIRED TO DEPART AND ARRIVE AT THESE AIRPORTS REGARDLESS OF WHETHER OR NOT THERE IS AN INTERMEDIATE STOP. B) FILING FLIGHT PLANS IN THE AIR IS NOT AUTHORIZED. C) OBTAIN AN AIR TRAFFIC CONTROL (ATC) CLEARANCE WITH DISCRETE TRANSPONDER CODE AS DESCRIBED IN DEPARTURE/ARRIVAL PROCEDURES BELOW. D) MAINTAIN TWO-WAY COMMUNICATION WITH ATC WITHIN THE CONFINES OF THE SPECIAL FLIGHT RULES AREA AND THE CLASS B AIRSPACE. E) HAVE AN OPERATIONAL MODE C TRANSPONDER. **END PART 2 OF 5 WIE UNTIL UFN**

2/1257 PART 3 OF 5 FLIGHT RESTRICTION WASHINGTON, DC. FLIGHT PLAN PROCEDURES: 1. EACH PILOT SHALL CALL LEESBURG AFSS AND PRIOR TO FILING FLIGHT PLAN SHALL IDENTIFY HIM/HER-SELF AND USE THE CONFIDENTIAL PILOT IDENTIFICATION CODE ASSIGNED TO THEM. 2. LEESBURG AFSS WILL ACCEPT FLIGHT PLAN AFTER VERIFYING CODE. 3. LEESBURG AFSS WILL FORWARD PILOT'S FLIGHT PLAN TO THE UNITED STATES SECRET SERVICE. 4. PILOTS SHALL CLOSE VFR FLIGHT PLANS WITH LEESBURG AFSS ONLY AFTER THEY ARE ON THE GROUND. 5. PILOTS MAY REQUEST AND ATC MAY ACCEPT CANCELLATION OF IFR WHILE IN THE AIR. HOWEVER, PILOTS ARE REQUIRED TO REMAIN ON THEIR ASSIGNED BEACON CODE UNTIL ON THE GROUND AND REQUIRED TO CONTACT LEESBURG AFSS AFTER THEY ARE ON THE GROUND. 6. LEESBURG AFSS WILL NOTIFY THE UNITED STATES SECRET SERVICE AND APPROPRIATE ATC FACILITIES WHEN THE FLIGHT PLANS ARE CLOSED. **END PART 3 OF 5 WIE UNTIL UFN**

2/1257 PART 4 OF 5 FLIGHT RESTRICTION WASHINGTON, DC. F) DEPARTURE PROCEDURES. EACH PILOT SHALL: 1. OBTAIN AN ATC CLEARANCE FROM WASHINGTON APPROACH VIA TELEPHONE NUMBER (703) 603-7020. 2. IFR - a) DEPARTING HYDE/WASHINGTON EXECUTIVE AIRPORT AND POTOMAC AIRPORT: ATC WILL PROVIDE EASTBOUND OR SOUTHBOUND RADAR VECTORS TO OUTSIDE THE SPECIAL FLIGHT RULES AREA. AIRCRAFT WILL THEN PROCEED ON COURSE AND REMAIN CLEAR OF THE SPECIAL FLIGHT RULES AREA. b) DEPARTING COLLEGE PARK AIRPORT (CGS): ATC WILL PROVIDE EAST-BOUND OR NORTHBOUND RADAR VECTORS TO OUTSIDE THE SPECIAL FLIGHT RULES AREA. AIRCRAFT WILL THEN PROCEED ON COURSE AND REMAIN CLEAR OF THE SPECIAL FLIGHT RULES AREA. 3. VFR - a) DEPARTING HYDE/WASHINGTON EXECUTIVE AIRPORT, POTOMAC AIRPORT, AND COLLEGE PARK AIRPORT: DEPART AS ASSIGNED BY ATC, EXPECTING A HEADING DIRECTLY AWAY FROM THE SPECIAL FLIGHT RULES AREA AIRSPACE UNTIL TWO-WAY COMMUNICATION IS ESTABLISHED WITH WASHINGTON APPROACH. AIRCRAFT WILL FLY AS ASSIGNED BY ATC UNTIL CLEAR OF SPECIAL FLIGHT RULES AREA AND/OR CLASS B AIRSPACE. **END PART 4 OF 5 WIE UNTIL UFN**

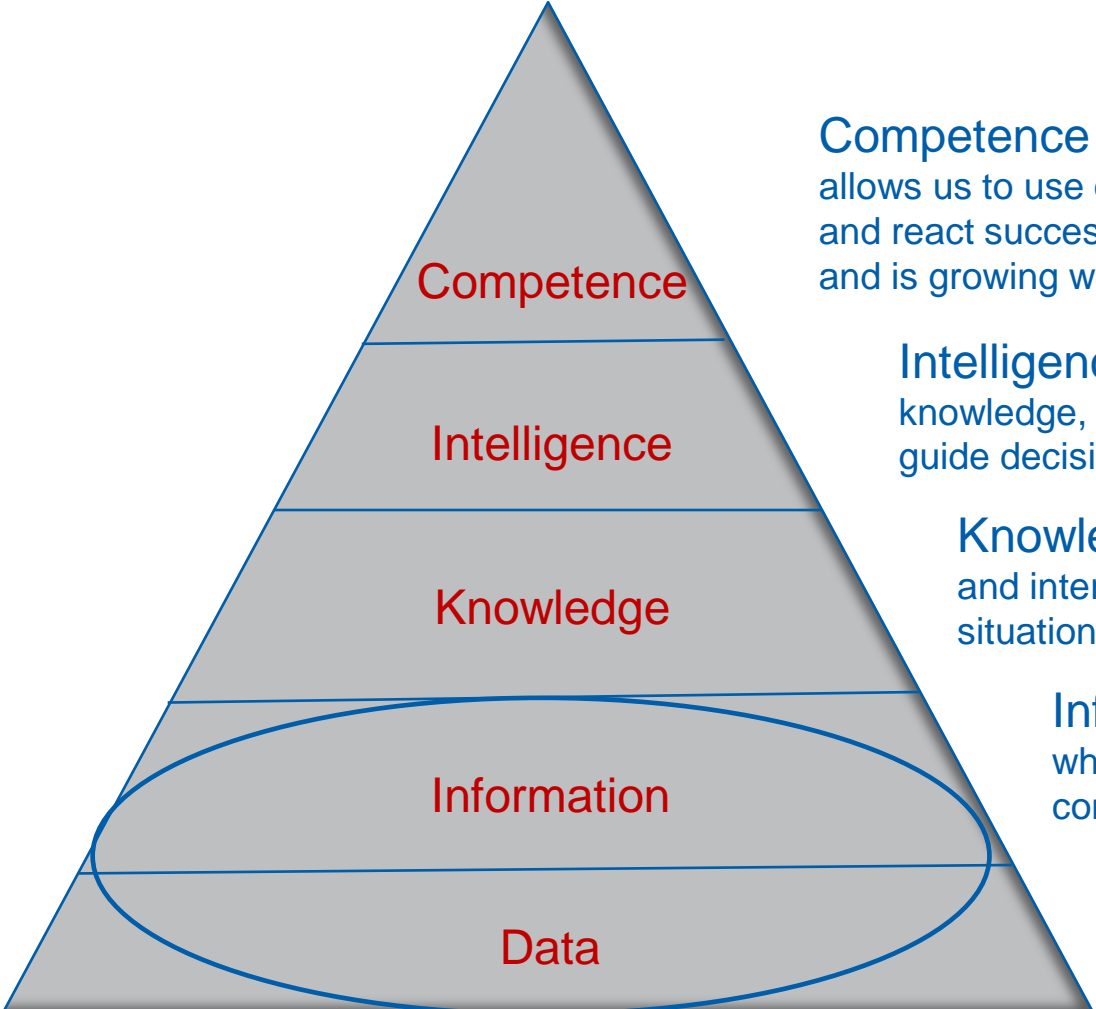
2/1257 PART 5 OF 5 FLIGHT RESTRICTION WASHINGTON, DC. G) ARRIVAL PROCEDURES. EACH PILOT SHALL: 1. ESTABLISH COMMUNICATIONS WITH ATC FOR AUTHORIZATION TO ENTER THE SPECIAL FLIGHT RULES AREA. 2. VFR: a) APPROACH TO COLLEGE PARK AIRPORT: AIRCRAFT SHALL REMAIN OUTSIDE THE TFR AIRSPACE UNTIL AUTHORIZED BY AIR TRAFFIC CONTROL TO ENTER THE SPECIAL FLIGHT RULES AREA. PILOTS CAN EXPECT ROUTING TO COLLEGE PARK VIA THE VICINITY OF FREEWAY AIRPORT. b) APPROACH TO POTOMAC AND HYDE/WASHINGTON EXECUTIVE AIRPORTS: AIRCRAFT SHALL REMAIN OUTSIDE THE SPECIAL FLIGHT RULES AREA AIRSPACE UNTIL AUTHORIZED BY AIR TRAFFIC CONTROL TO ENTER THE TFR. PILOTS CAN EXPECT ROUTING TO POTOMAC AND HYDE/WASHINGTON EXECUTIVE AIRPORTS VIA THE VICINITY OF MARYLAND AIRPORT OR NOTTINGHAM VOR. 3. IFR a) IFR ARRIVALS TO COLLEGE PARK, POTOMAC, AND HYDE/WASHINGTON EXECUTIVE AIRPORTS ARE AUTHORIZED. H) THE FAA WILL EVALUATE THESE PROCEDURES AFTER 60 DAYS. I) ANY QUESTIONS ON THIS MATTER SHOULD BE DIRECTED TO TOM DAVIDSON AT (202) 2 67-7232. **END PART 5 OF 5 WIE UNTIL UFN**

An Aviation Example



Data versus Information

Pyramid of Competency

A pyramid diagram divided into five horizontal layers. From top to bottom, the layers are labeled: Competence, Intelligence, Knowledge, Information, and Data. A blue oval encircles the bottom three layers: Information, Knowledge, and Data.

Competence — the ability to do a job properly. It allows us to use our intelligence for doing wise decisions and react successfully based on situational awareness and is growing with experience on the job to be done.

Intelligence — The full collection of past and present knowledge, which allows us to assess new situations and guide decisions

Knowledge — all what has been detected, learned and internalized and has developed in insight and situational understanding

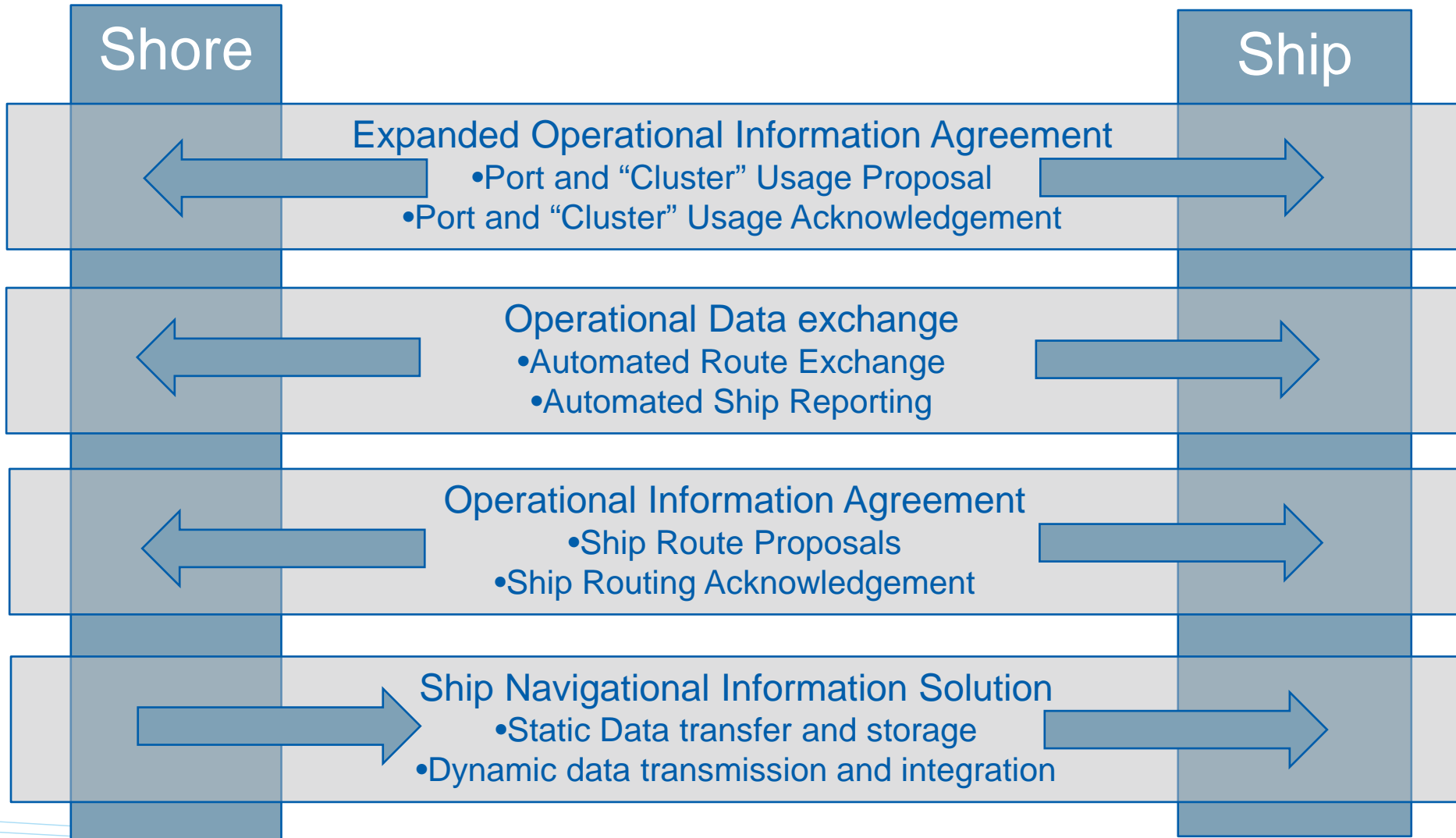
Information — integrated and processed data, which is useful and meaningful for the data consumer

Data — collection of facts, which may be compiled, but by themselves do not have a specific meaning or usability

Michael Bergmann, e-Maritime Annual conference 2012, 22 - 23 November, Brussels

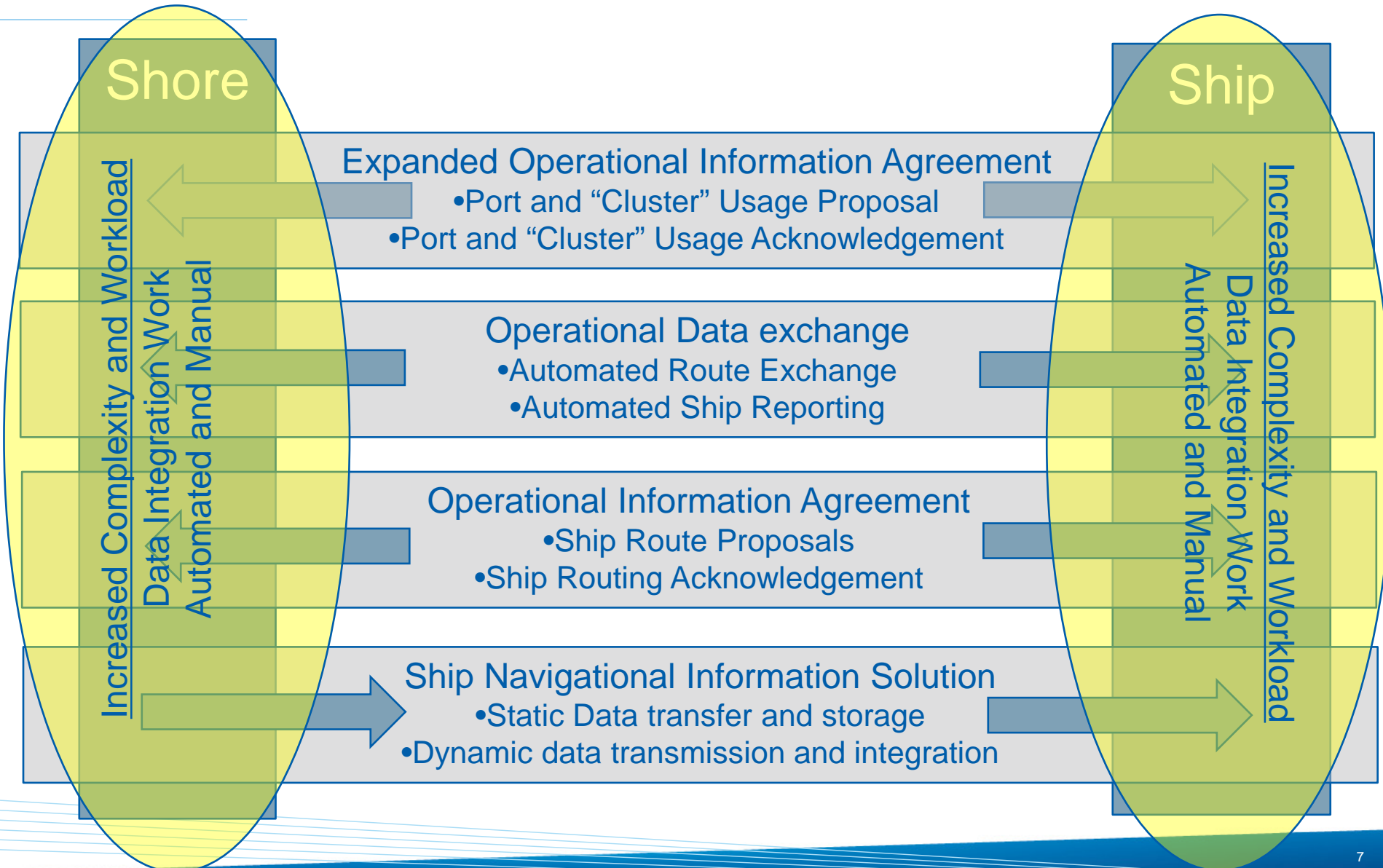
The Data and Information Diagram

Multi Dimensional Data Integration



Multi Dimemnsional Data Integration

The „Source-Consumer“ Approach



Multi Dimensional Data Integration

The „Data Service Provider“ (DSP) Approach

Data Provision Framework



DSP hide format issues from Originators

Data Integration Framework



Delivery

DSP hide integration issues from Users

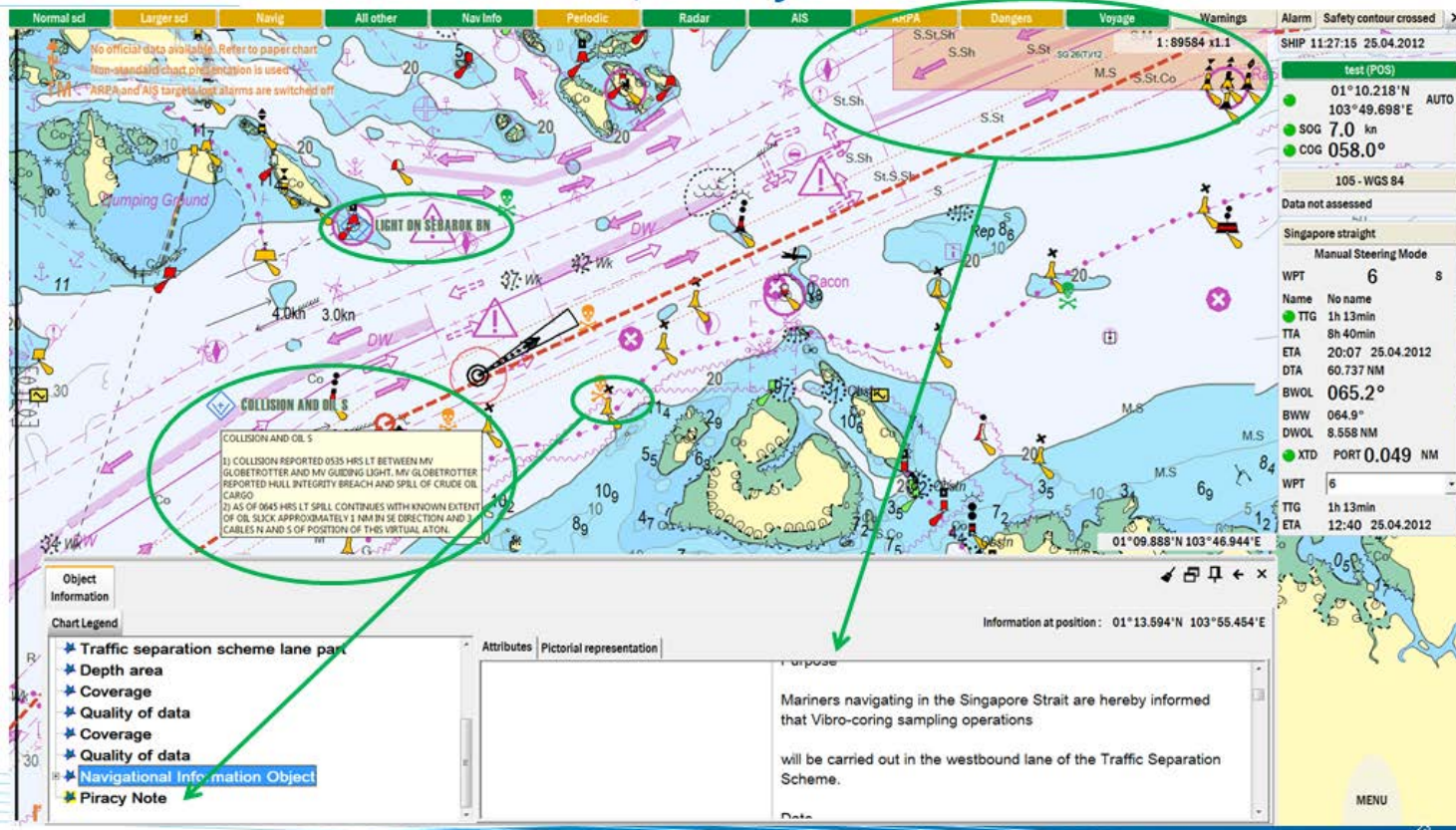
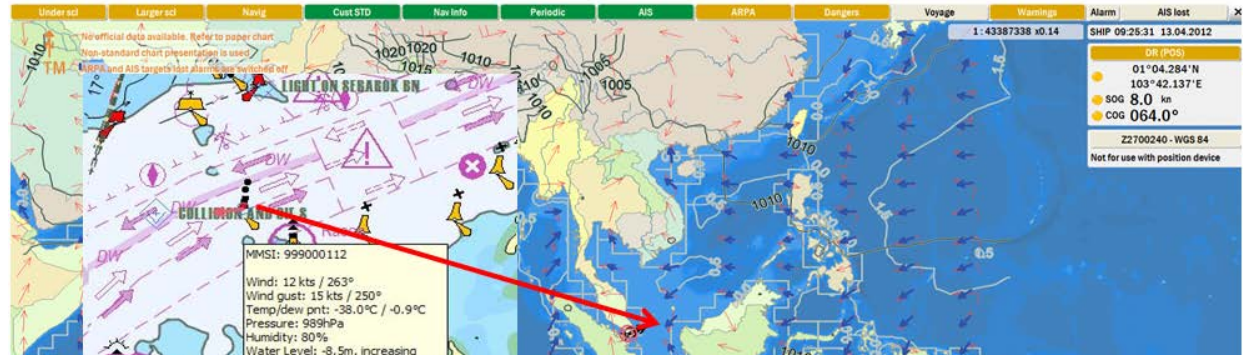
Information System Framework



HO = Hydrographic Office
ODP = Official Data Provider
NPD = Non-Official Data Provider

E-Navigation: Data with Time Dimension

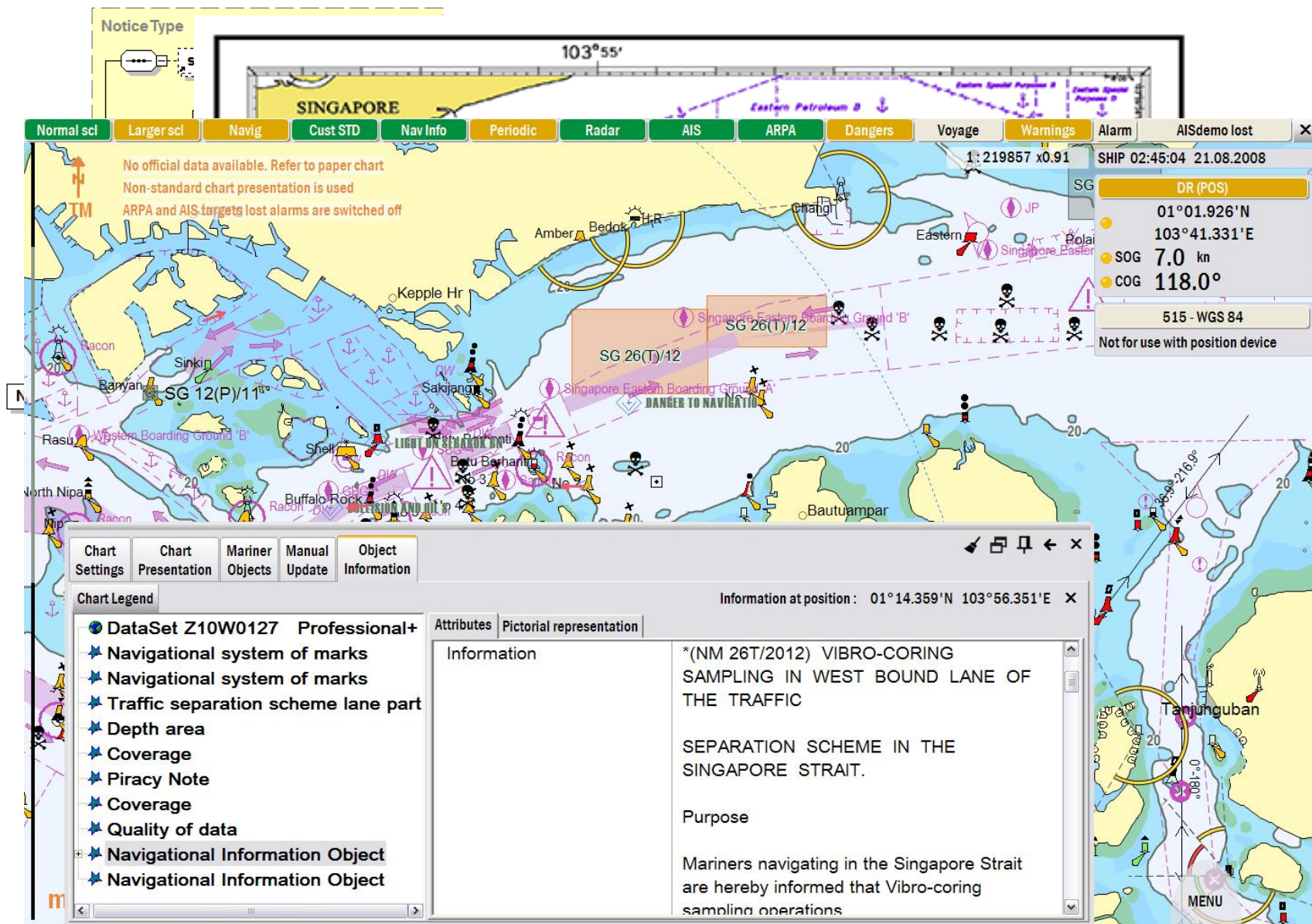
Static and
pre-composed Data



Dynamic and
real-time Data

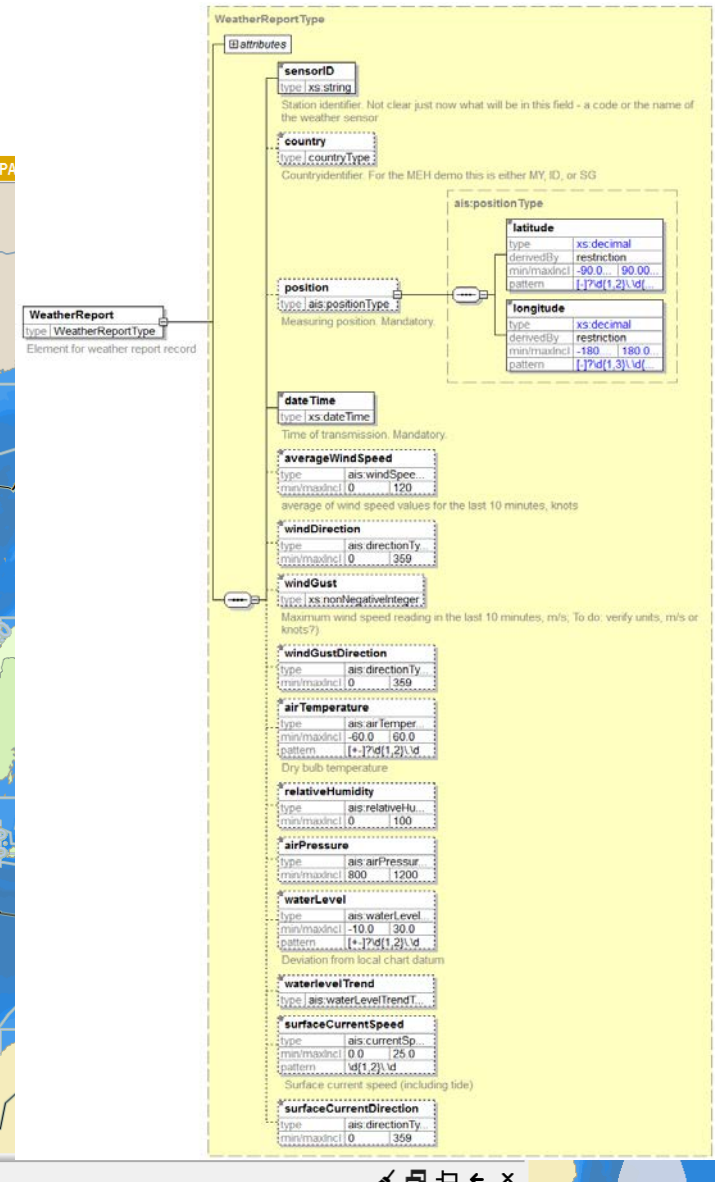
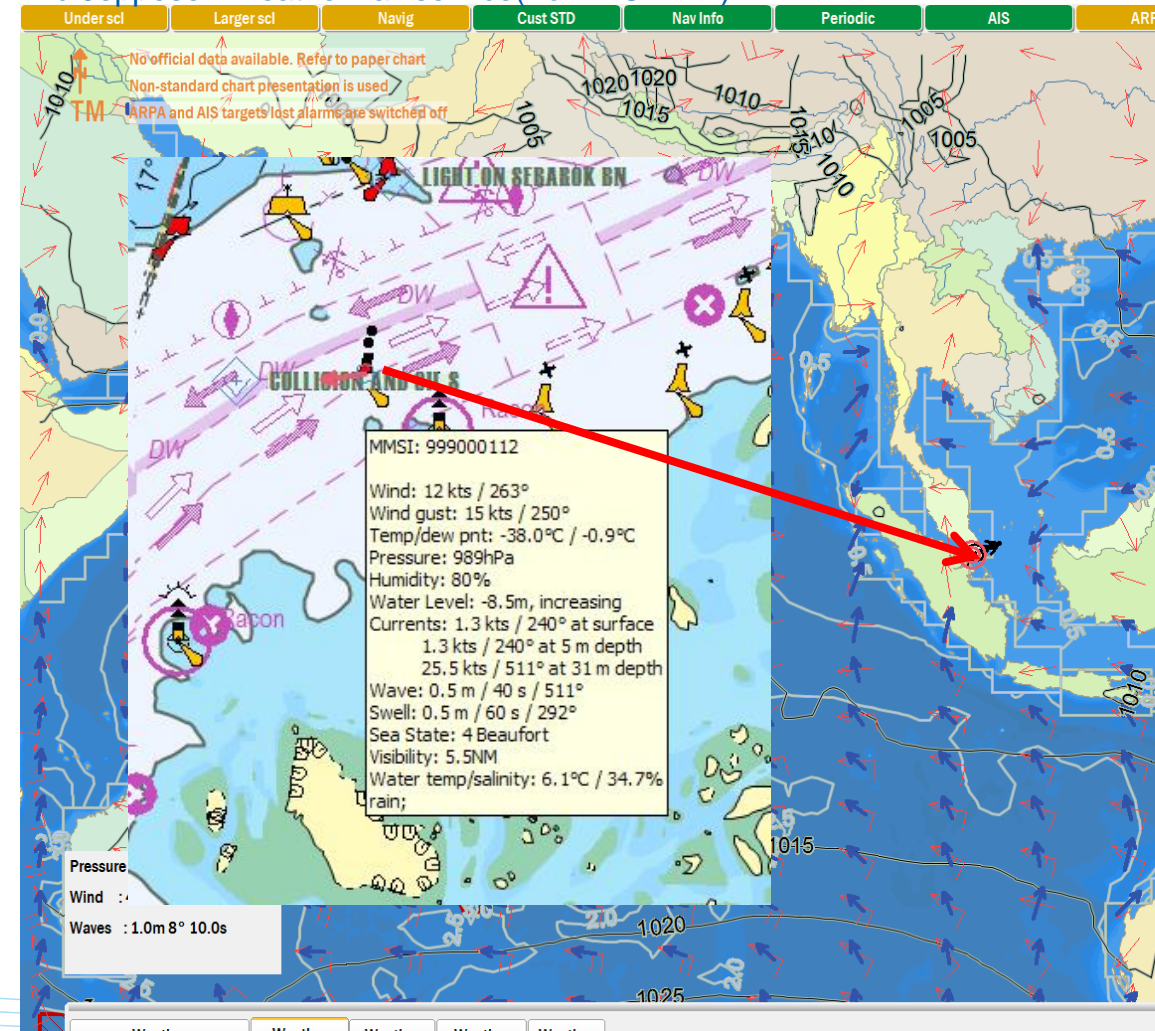


NTM/T&P XML “10x” Proposal



Weather Report XML "S10x" proposal

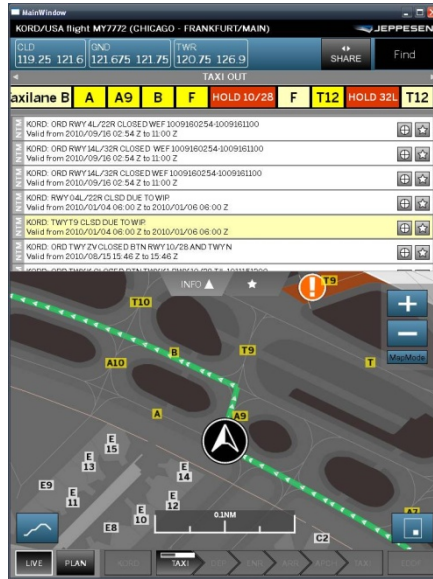
Based upon MEH METHYD data available at www.mehsoms.com
And Jeppesen WeatherNav service(from ECMWF)



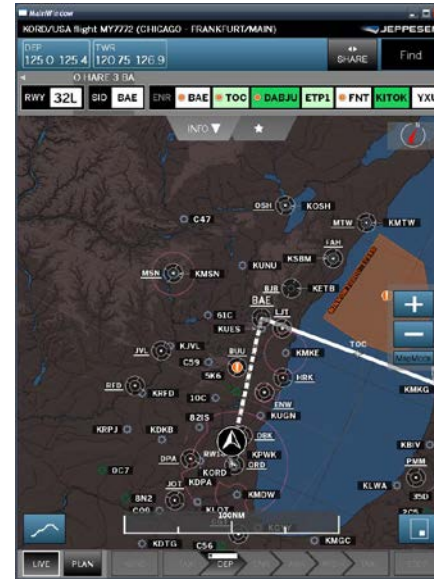
Aviation example



Graphical
NOTAM



Text
NOTAM



Enroute NOTAMS



Nat
Tracks

Context: e-Navigation Framework

Existing ECDIS Regulations
*Detail Performance Standards including
“What and How”*

General e-Navigation Specifications
*(Policies, Collaborations, Architecture,
Communication, Portrayal...)*

Regulatory Frame on

WHAT

Innovative Space for Industry on

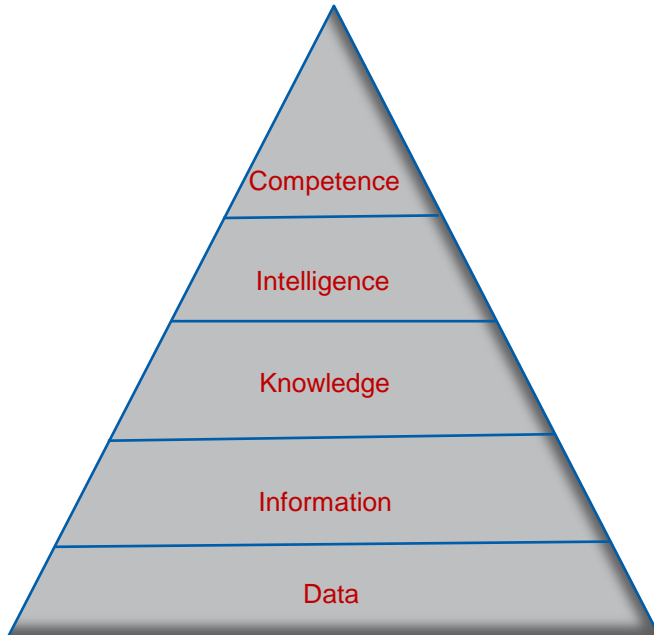
HOW

Regulatory Frame on

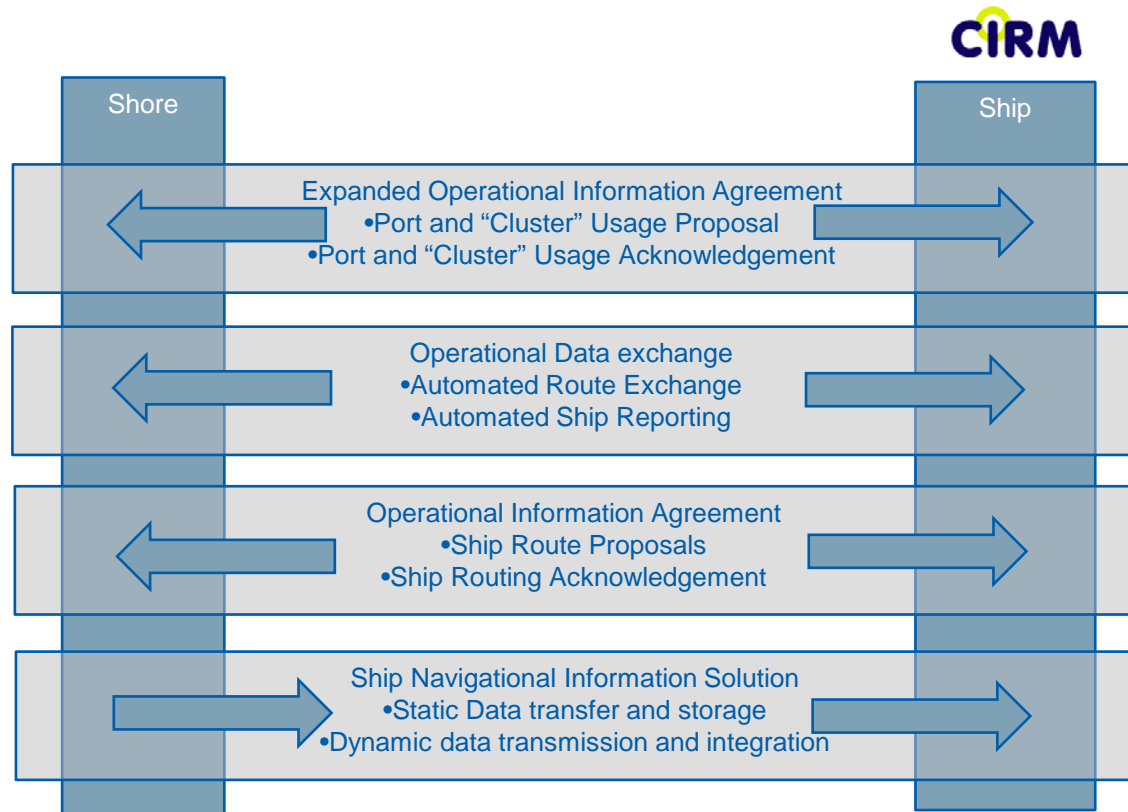
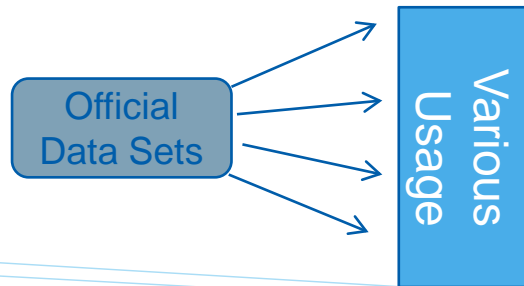
WHAT

Conclusion

Pyramid of Competency



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Data Provision Framework



DSP hide format issues from Originators

Data Integration Framework



Delivery

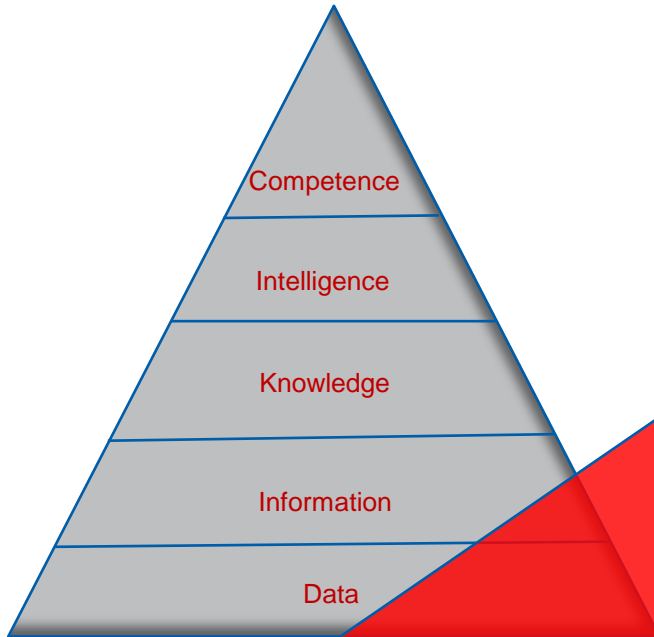
Information System Framework



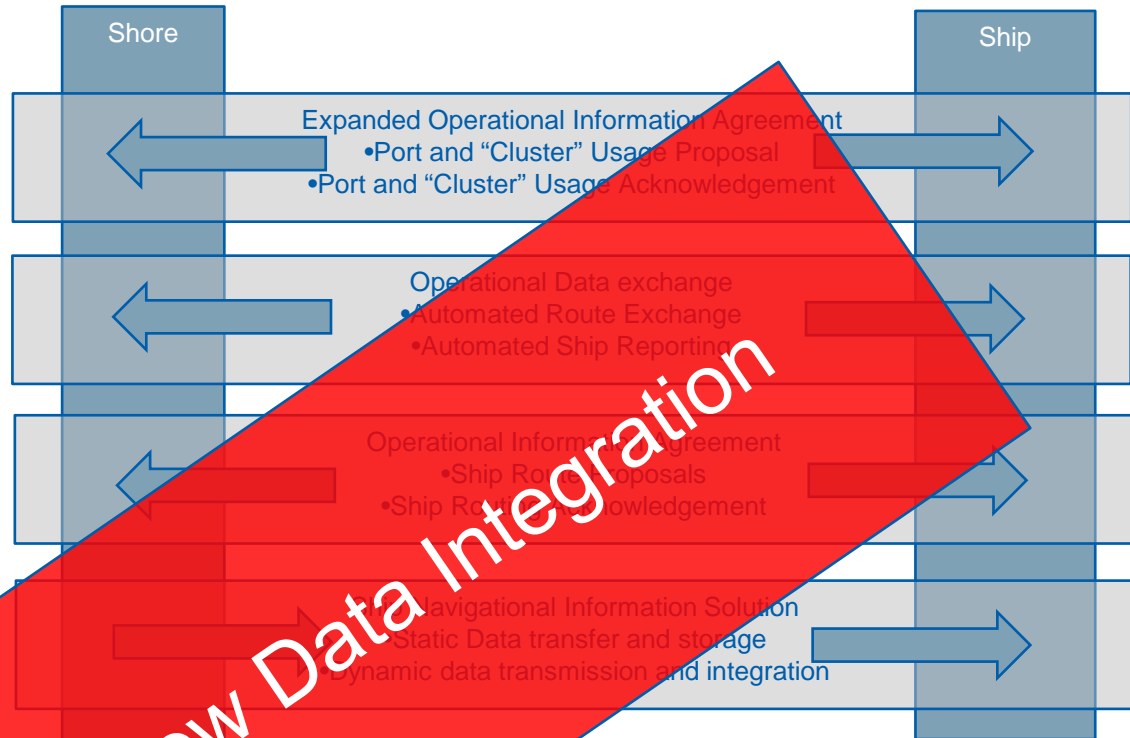
DSP hide integration issues from Users

Conclusion

Pyramid of Competency



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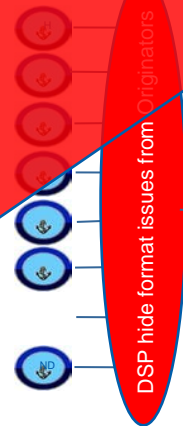
Enable and allow Data Integration

HO Data Sets

Division Framework

Data Integration Framework

Information System Framework



Delivery



THANK YOU !

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