



*MIT International Center for Air Transportation*

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# **Human Factors Considerations in in Future Oceanic Air Traffic Control System Architecture**

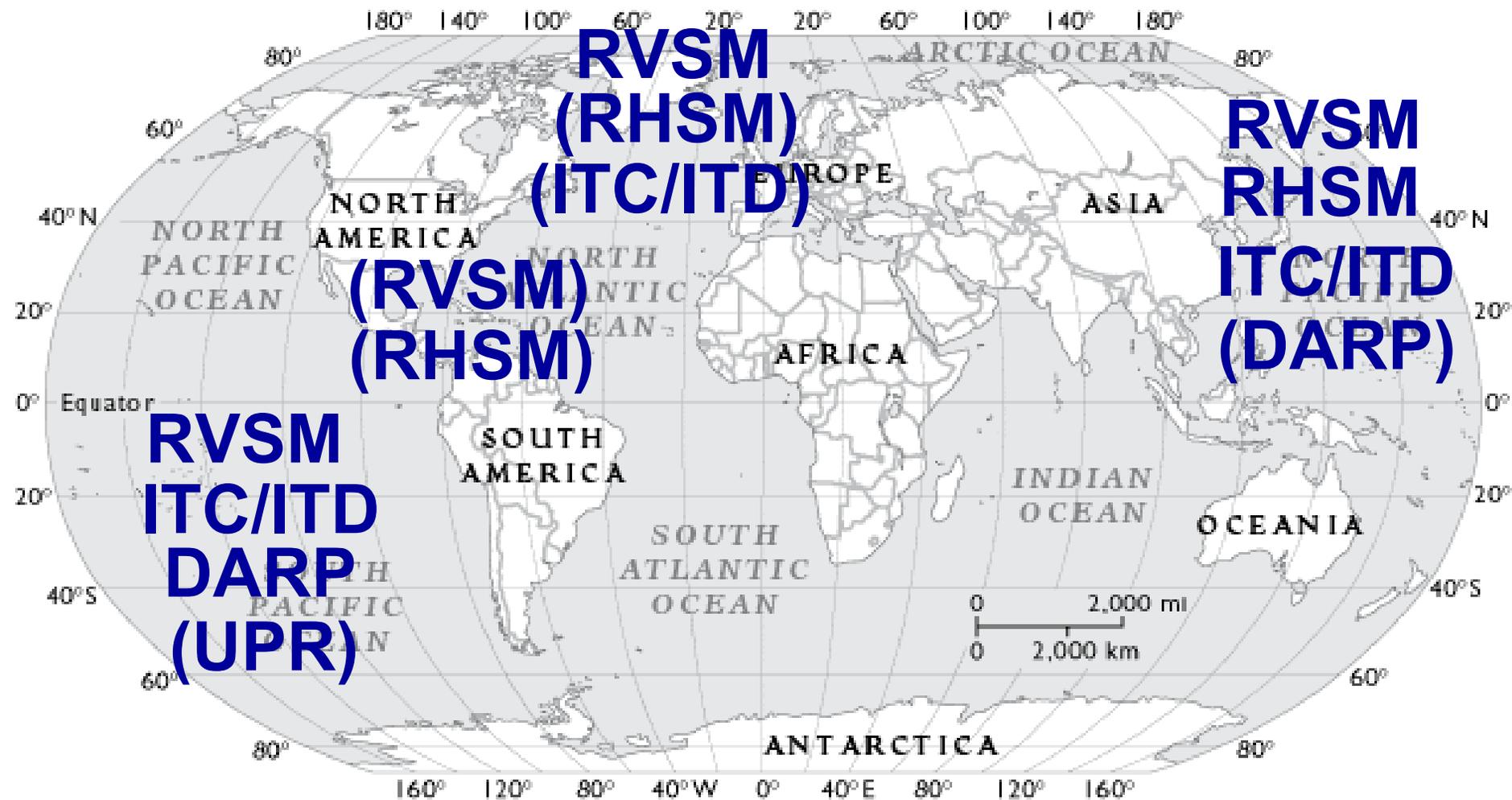
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Hong Li, & R. John Hansman**

**Massachusetts Institute of Technology  
October 17<sup>th</sup>, 2002**



# Oceanic ATC Initiatives

## THE WORLD



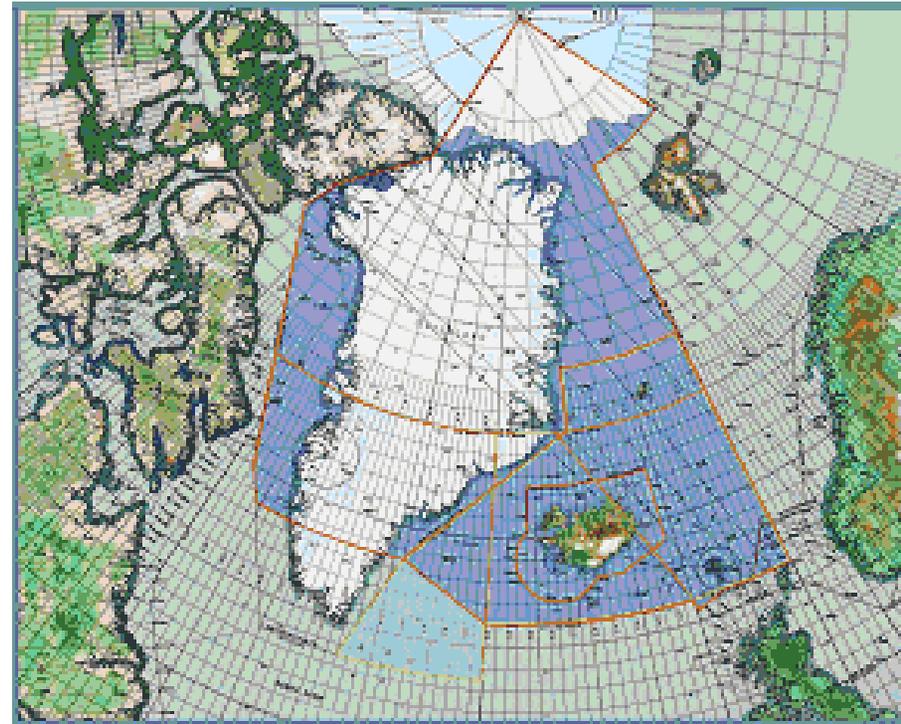


# US/Icelandic Joint Effort

- University of Iceland and MIT
- CAA of Iceland and FAA
- Research program aimed at Oceanic Air Traffic Control
- Icelandic Airspace is huge, has few control centres and relatively few controllers – excellent testing ground!



UNIVERSITY OF ICELAND

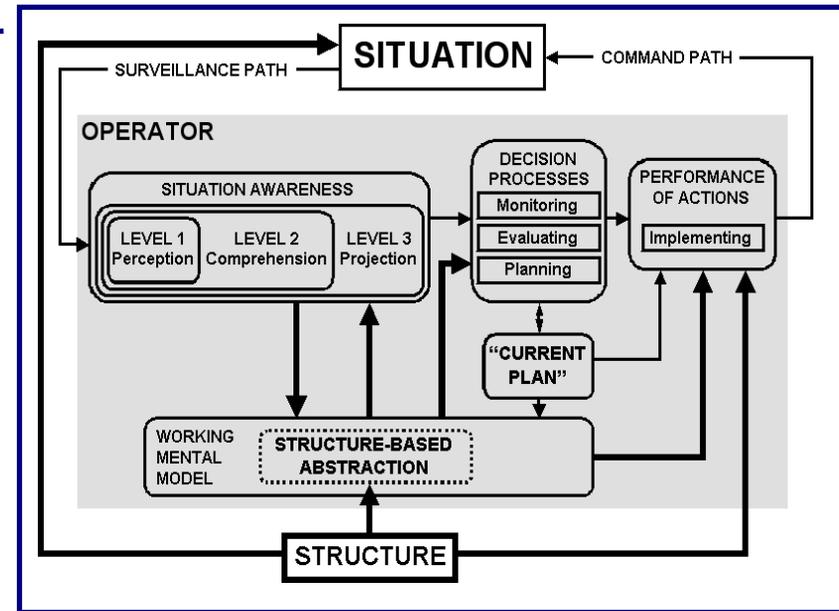
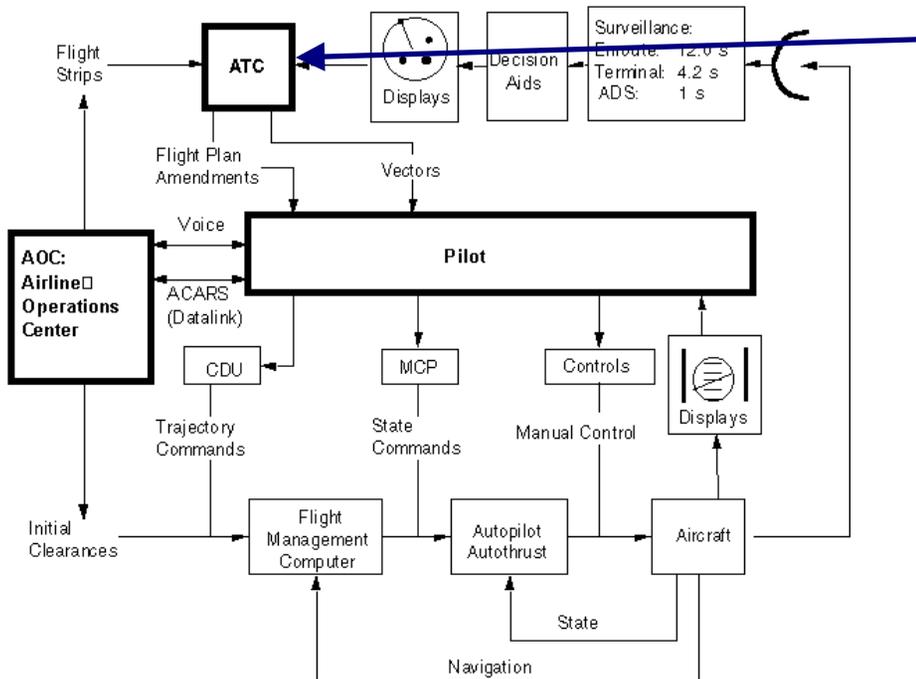




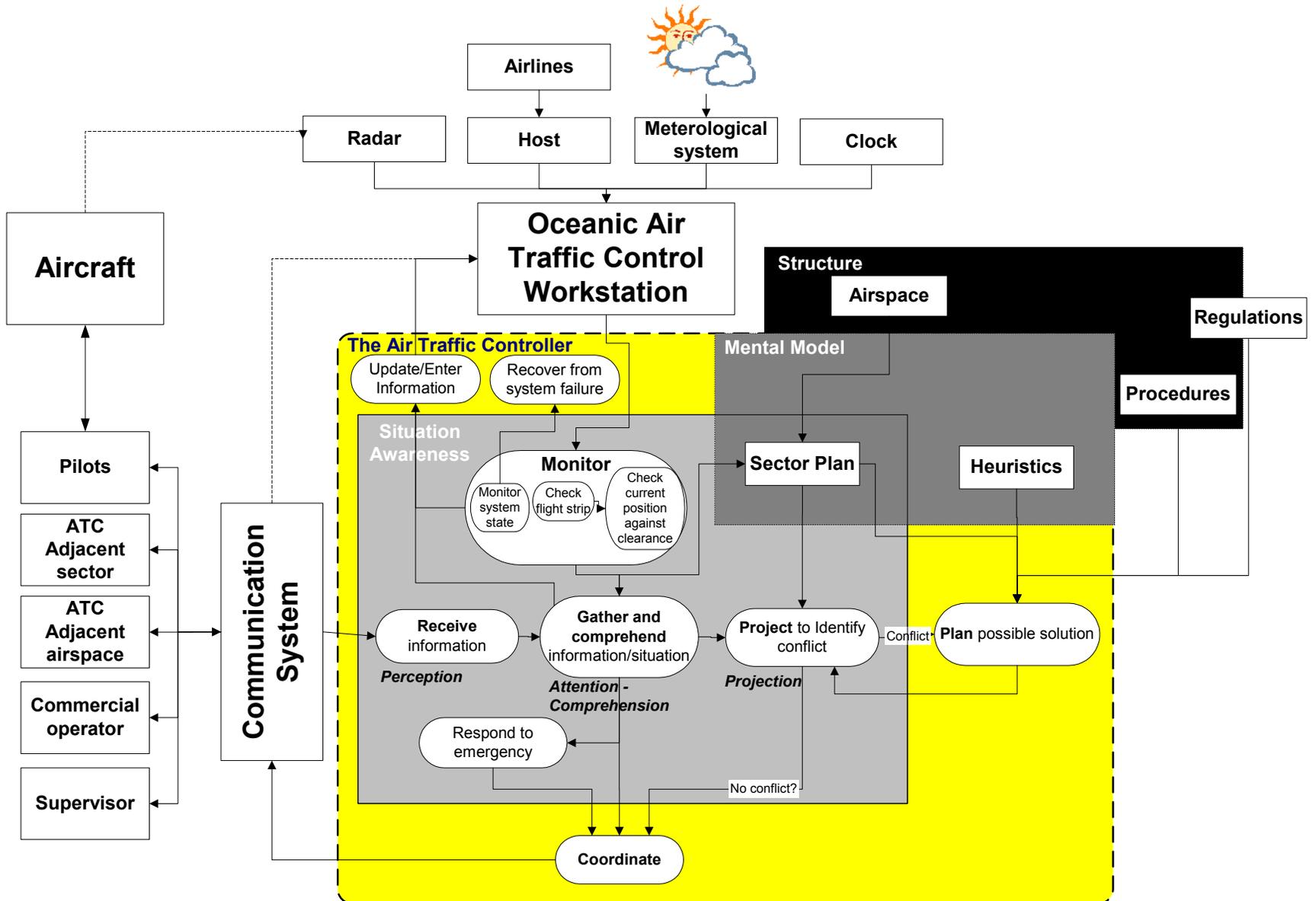
# Motivation

- Oceanic air traffic control systems are evolving and new technologies, such as ADS-B, will likely be incorporated
- These technologies will influence the tasks of the controller, therefore human factors considerations should be integrated into design from the beginning
- An **Integrated Human-Centered Systems Approach** is suggested as the basis for
  - evaluation of the effect of new technology on the current oceanic environment and
  - recommendations for design of future information systems

- Integrated Human-Centered System Approach
- Operator Process Model

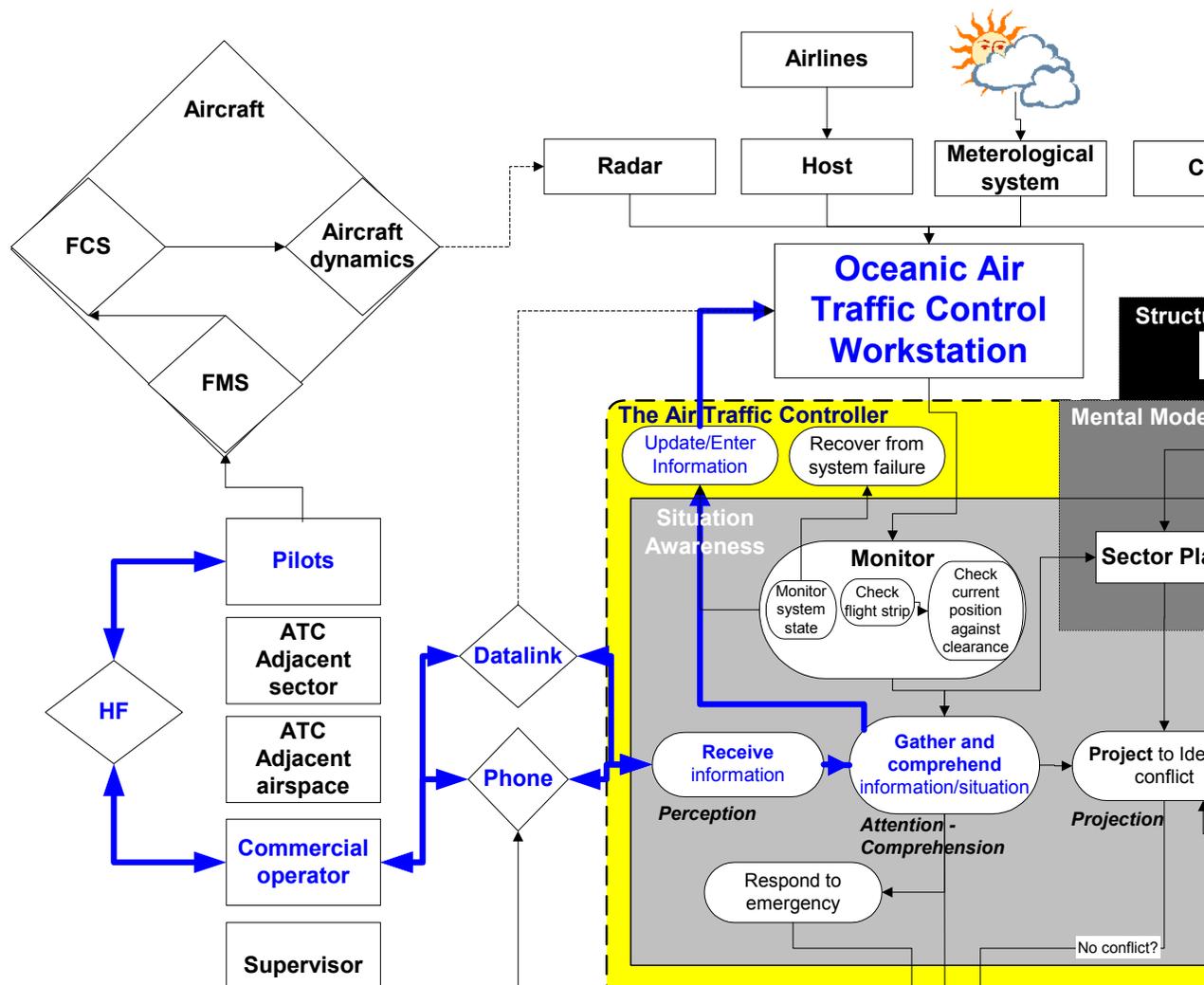


# Preliminary Oceanic Control Process Model



- Information from the aircraft to the controller

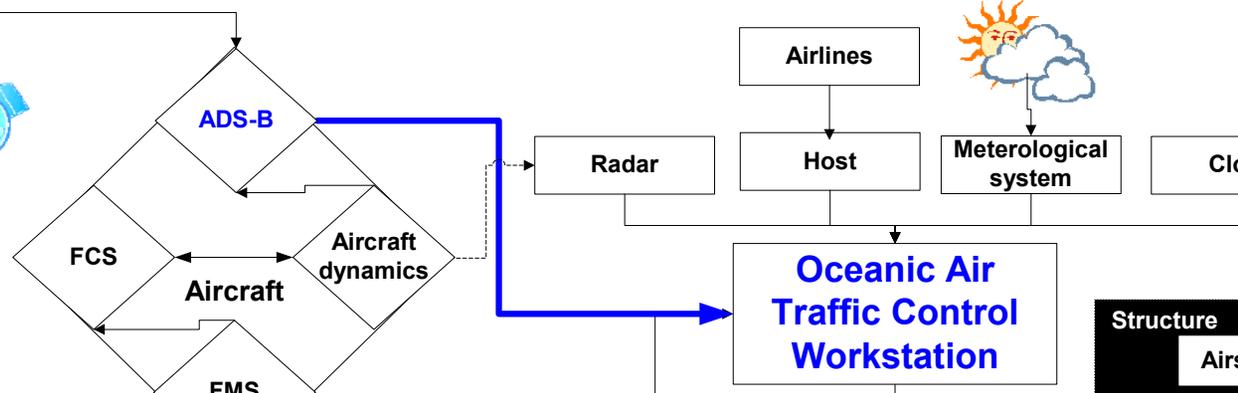
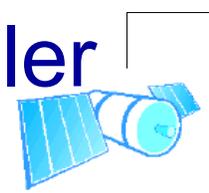
*Current situation*



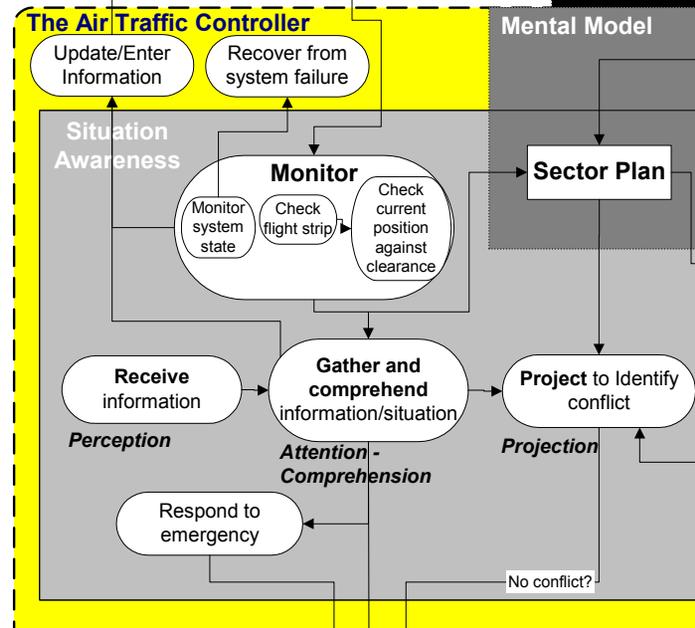
# Current & Future Technologies – Communication System

- Information from the aircraft to the controller

*Future situation*



- Pilots
- ATC Adjacent sector
- ATC Adjacent airspace
- Commercial operator
- Supervisor





# Oceanic functions affected by future technologies

- Monitoring will be affected because the information are fed directly into the workstation which ***affects the ATC's Situation Awareness*** and ***makes the commercial operator redundant.***
- By using an integrated system which includes and displays all relevant information to the controller the ***system can support the controller*** e.g. by doing conflict probing.
- With more information on the airspace, pilots will be more able to decide where to move within the airspace (user preferred routing, free flight) which raises ***authority issues.***
- ***AND MORE!***



# Next steps

- Gather more detailed information on Oceanic Air Traffic Control by site visits, for further development of the model.
- Do a comparative analysis of the oceanic facilities
- Facilitate integration with the new US oceanic system with other newly developed systems
- Make recommendations for design of new system and procedures



# Comments/Questions

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