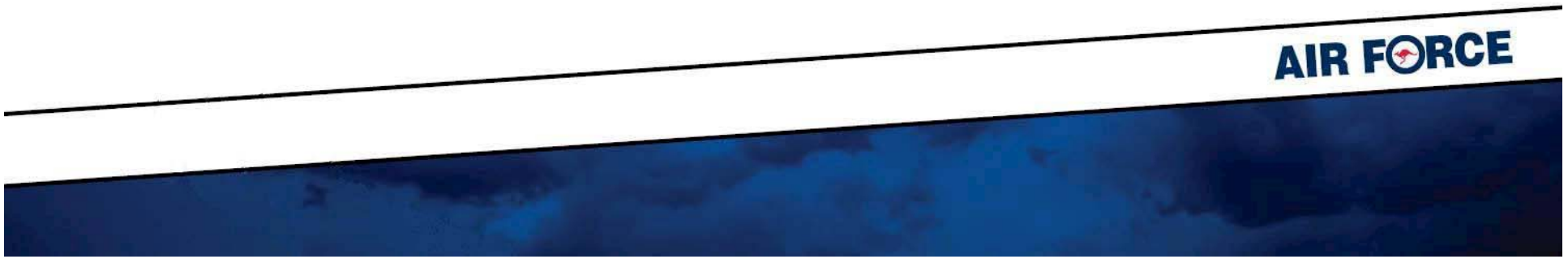
Future MPA:
P-8A Poseidon

GPCAPT Roger McCutcheon – Director MISRR Transition Office

MISRR Transition Office

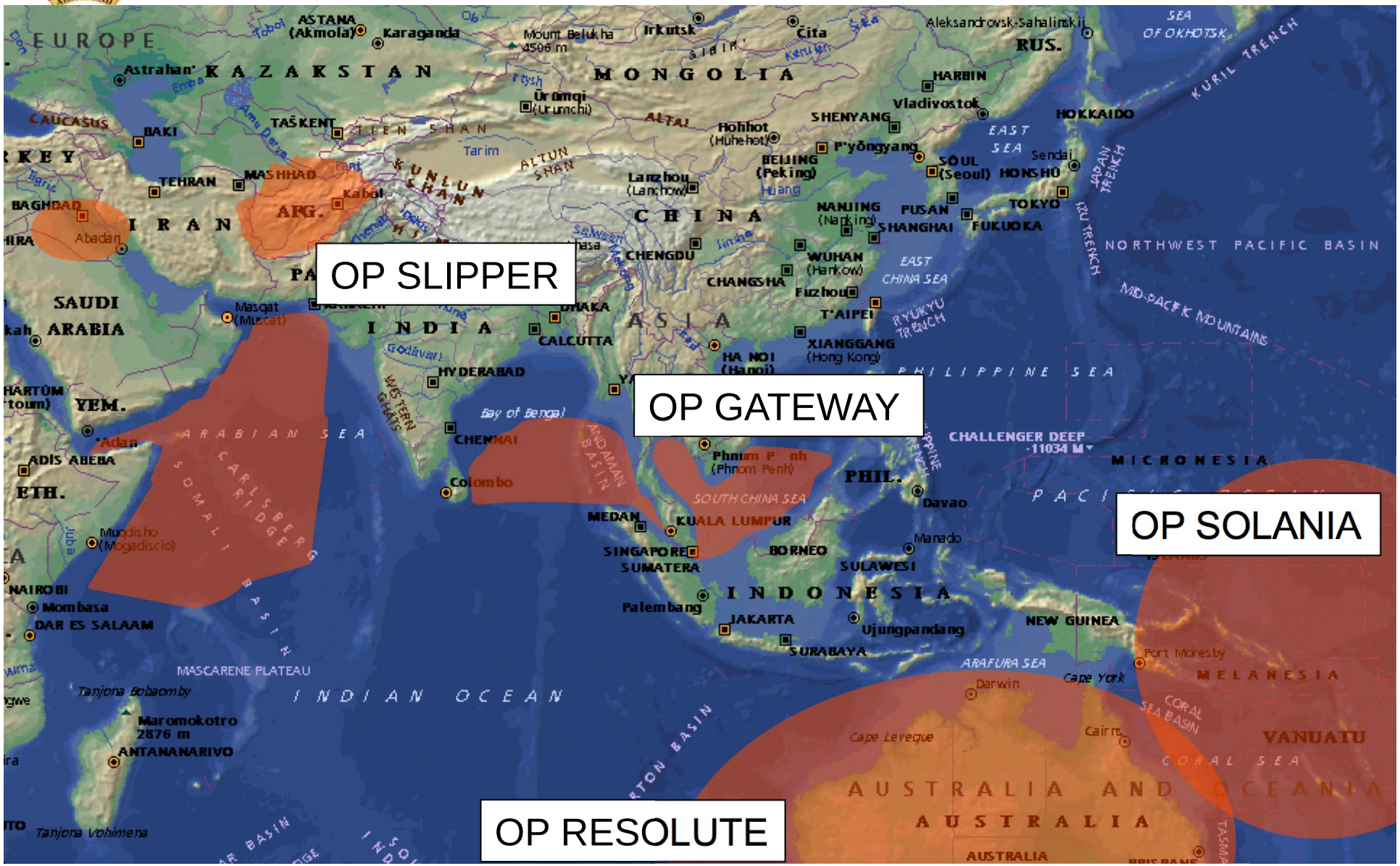
Scope

- MPA requirement
- P-8A transition
- P-8A overview
- Future development



MISRR Transition Office

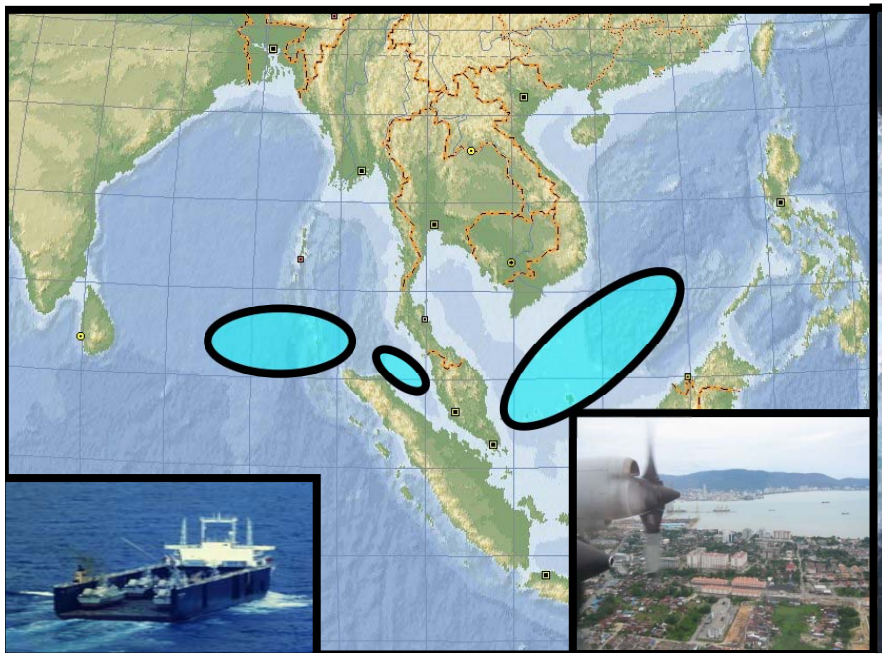
Recent AP-3C Operations



MISRR Transition Office

OP GATEWAY

- RMAF Base Butterworth (Malaysia)
- Maritime Security
- South China Sea - area of increasing strategic importance and tension
- Challenging and demanding environment



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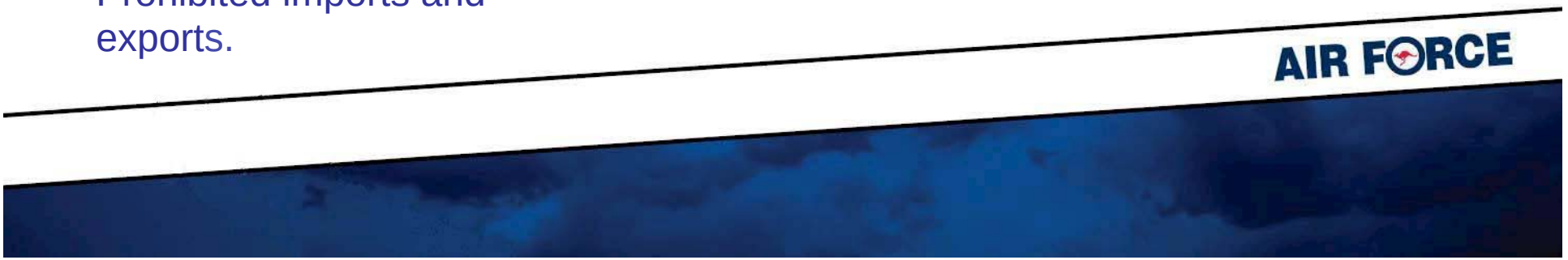
OP RESOLUTE

- Operation RESOLUTE Area of Operations covers approximately 10% of the world's surface and includes Australia's Exclusive Economic Zone.
- Includes Irregular Maritime Arrivals, Maritime terrorism, Piracy, illegal activity in protected areas, illegal exploitation of natural resources (e.g. illegal fishing), Marine pollution and Prohibited imports and exports.



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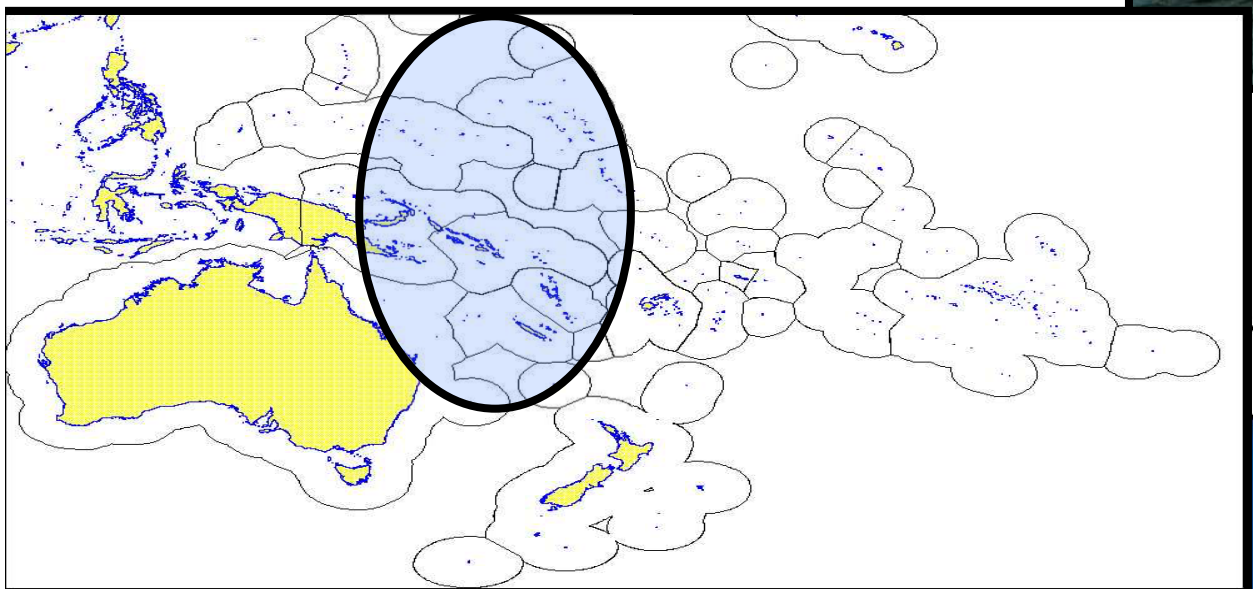
OP SOLANIA

- Foreign fisheries patrol
- Important strategic regional engagement



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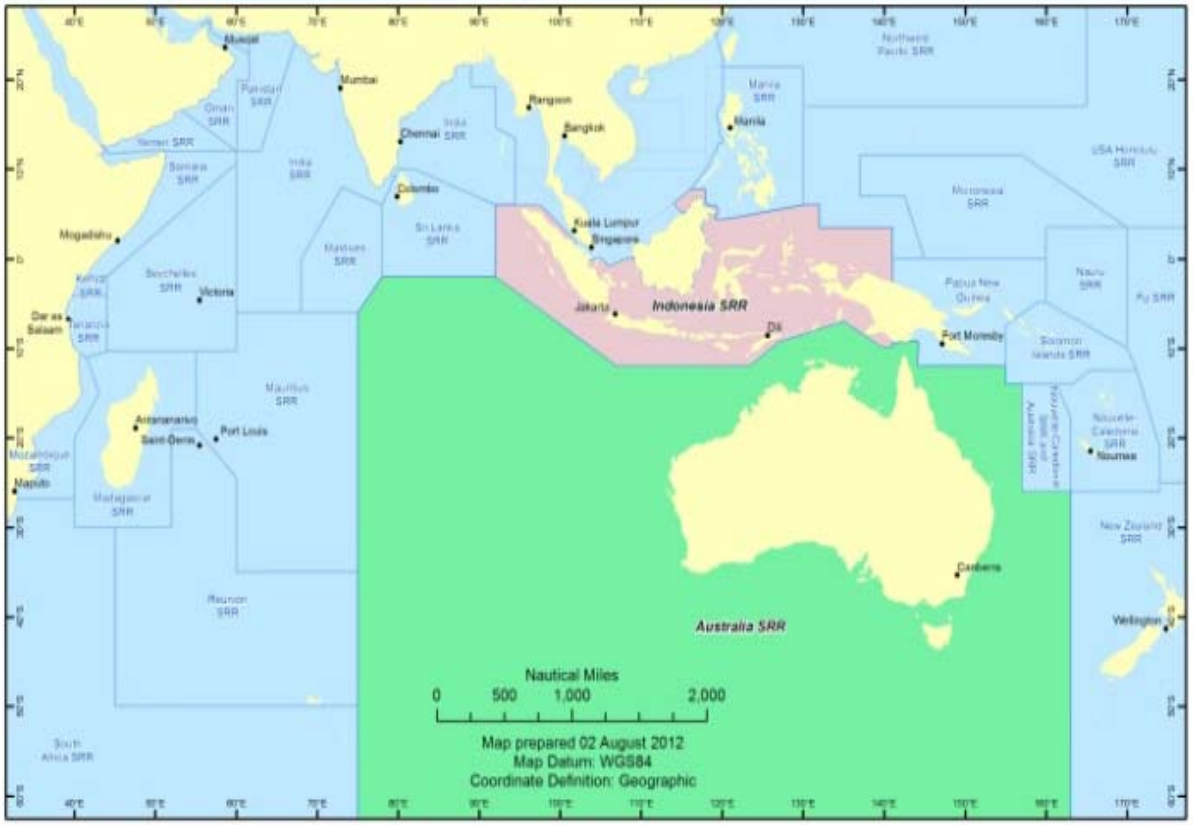
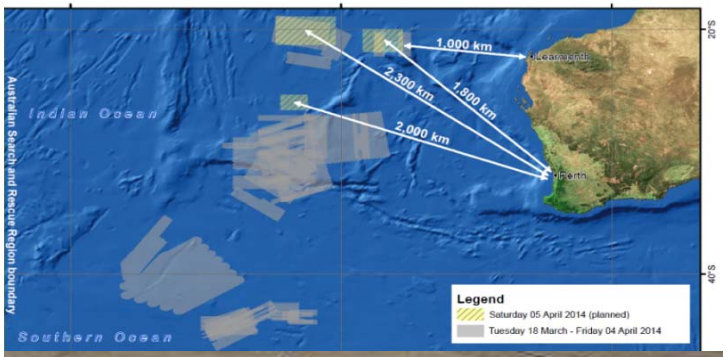
Search and Rescue

- Vast area of responsibility – a frequent task for MPA
- Recent major SAR: MH-370 in 2014



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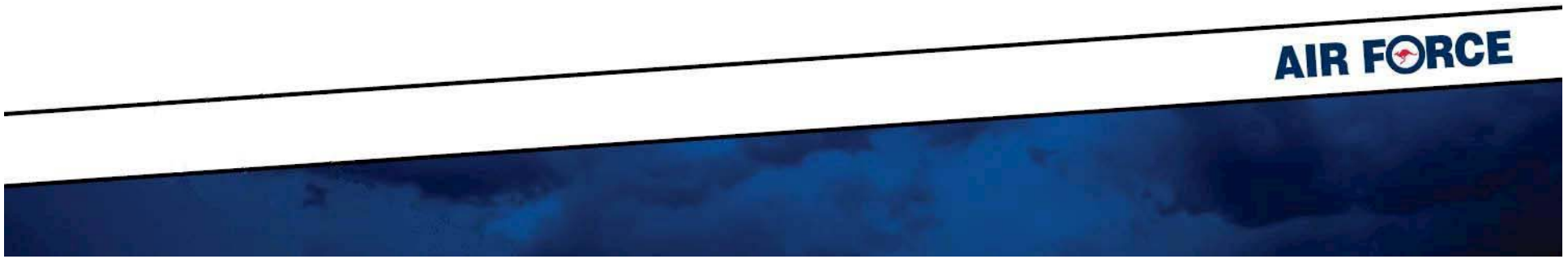
MISRR Transition Office

Current Aircraft

- AP-3C Orion
- No 10, 11 and 292 Squadrons
- Capability
  - Radar, Electro-optic, Electronic Support Measure, Magnetic Anomaly Detection and Acoustic sensors
  - Torpedo and anti-ship missile weapons



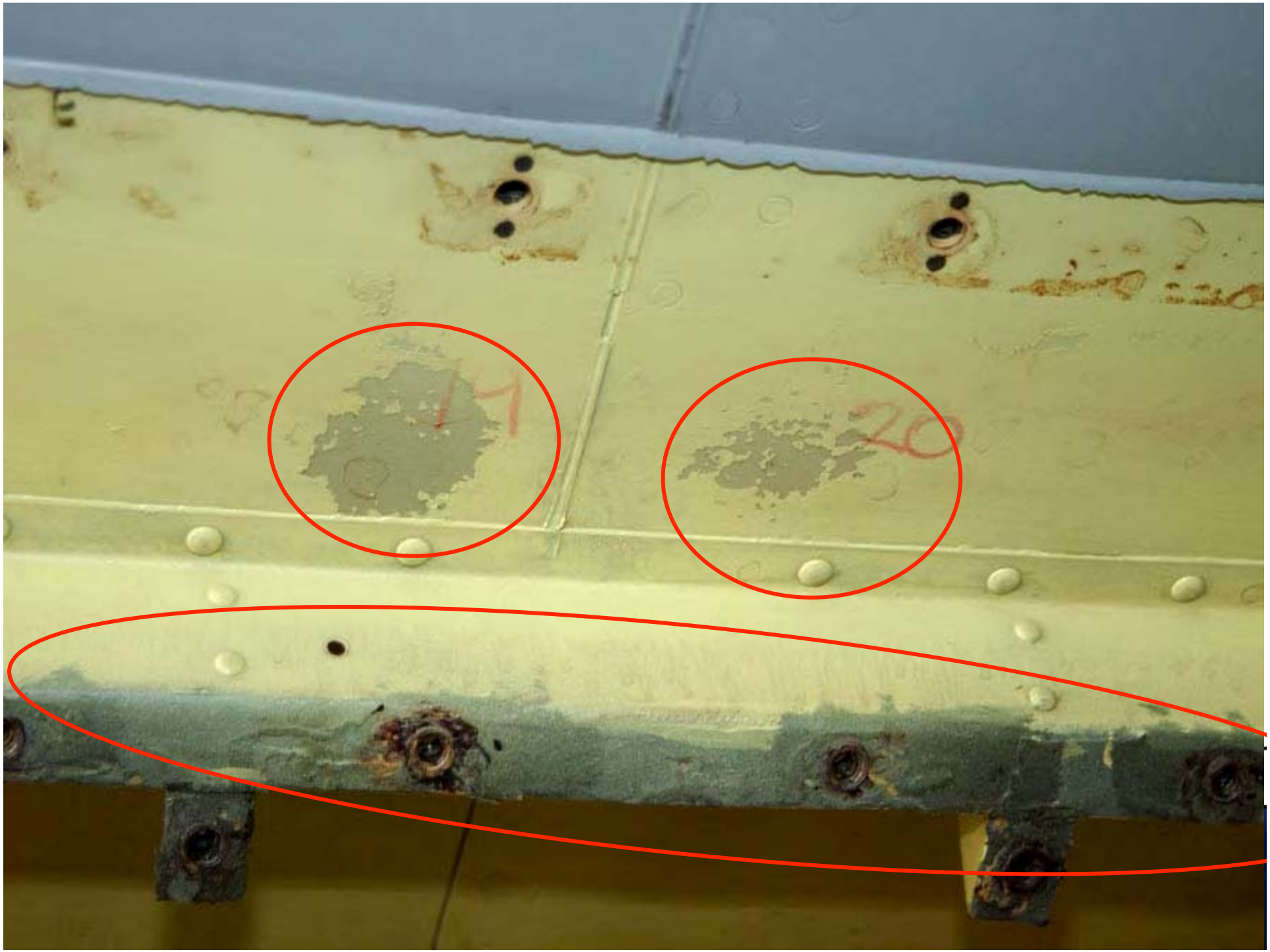
MISRR Transition Office

The Time Imperative – Obsolescence

Replace the ageing AP-3C Mission Systems

- Mission systems aged:
  - Unique systems
  - Increasingly unreliable
  - Approaching obsolescence
    - eg displays driven by 1980s technology
  - Many systems no longer supported by Original Equipment Manufacturer (OEM)
- Higher costs for less reliable capability
- Less effective against modern technology

AIR FORCE



MISRR Transition Office

Capability Requirement

A vital part of Australia's National Maritime Strategy

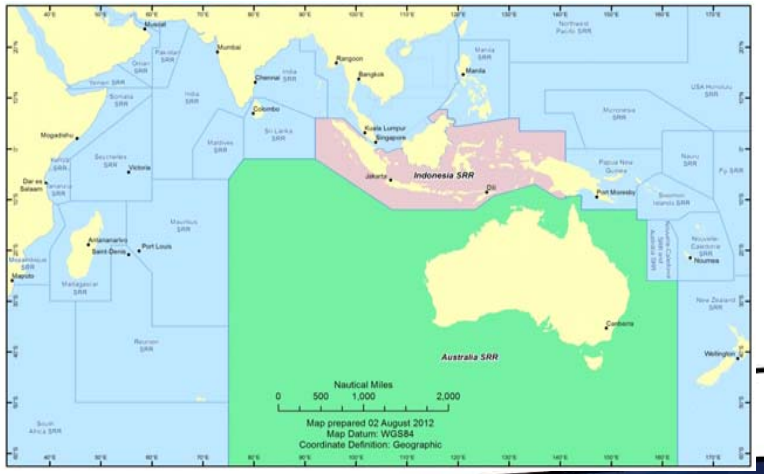
White Paper 2013 - Maritime Intelligence, Surveillance, Reconnaissance and Response

'The Government intends to replace the AP-3C fleet with P-8A Poseidon aircraft, complemented by unmanned aircraft capable of undertaking broad area maritime surveillance and fleet overwatch.

The goal is to provide long-range, long-endurance maritime surveillance and response and an effective anti-submarine and anti-surface warfare capability.

Defence will continue to investigate options for a mixed manned and unmanned aircraft fleet to inform Government consideration later in the decade.'

Submarine Periscope



Search and Rescue Region

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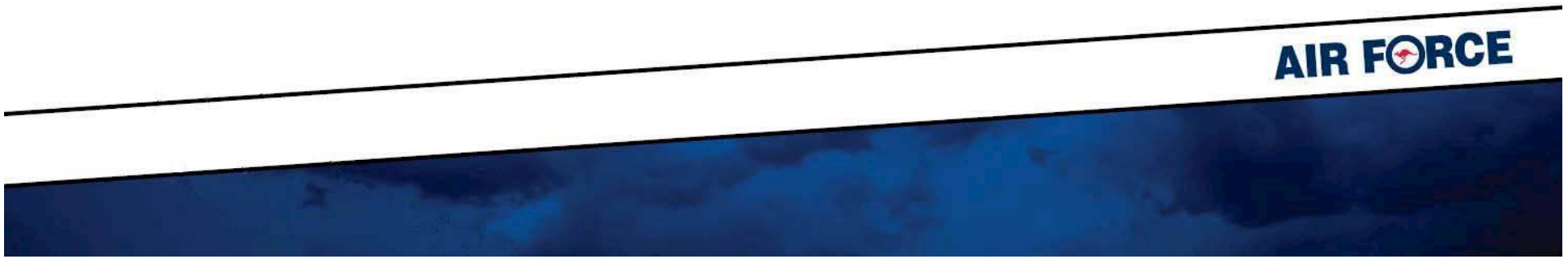
Transition to P-8A



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Family of Systems to replace AP-3C Orion

12

P-8A

Poseidon

AIR 7000 Ph2B

Response

Maritime Patrol

Multi Mission Sensor Suite

Large Weapon Payload

Complementary

6

AIR 7000 Ph1B

Persistent

Long Range ISR

Search Sensor Suite

C4I Network Node

MQ-4C

Triton

Anti Submarine Warfare
Search, Track, Attack

Anti Surface Warfare
Attack

Search and Rescue

Anti Surface Unit Warfare

Search, Identify

Track

Maintain the

Maritime Picture

ISR Support

to Government

Intel Data

available across DSN

MISRR Transition Office

P-8A Schedule

- **Overall - On track**
- **Planned Delivery Schedule**
  - **Mar 16:** Facilities commence EDN
  - **Apr 16:** Aircrew/Maint transition training starts (VP-30 NAS Jacksonville)
  - **Nov 16:** First RAAF P-8A Rollout
  - **2017:** OT&E, introduction to all roles
  - **Q1 2018:** IOC
  - **Jul 18:** Aust based training commences
  - **Q4 2018:** Last Aircraft
  - **Q4 2019:** FOC
  - **2019+:** Additional 4 x P-8As

MISRR Transition Office

AIR7000 Programmatic View

Calender Year

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027

Ph2B/2D

P-8A Poseidon (12)
RAAF EDN

Ph2C

P-8A Major Update

Ph1B

MQ-4C Triton

AP-3C ORION
RAAF EDN

PWD

AP-3C ORION
RAAF EDN

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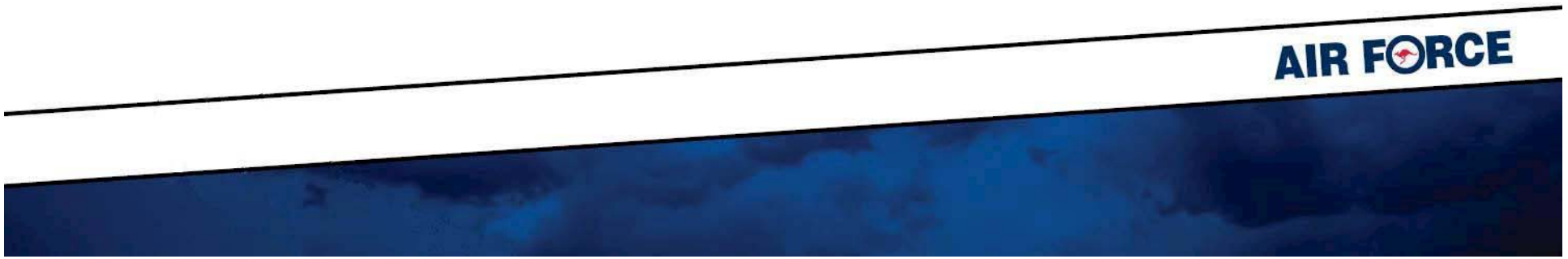
Acquisition and Support Strategy

- Procurement with the US Navy under a Cooperative Program
  - Australia require 12 aircraft. The USN up to 117 aircraft.
  - Shared acquisition, engineering and logistics functions
  - Cooperatively developed future capability
  - Sustainment efficiencies for the P-8A fleet
- RAAF P-8A is virtually identical to USN P-8A
- P-8A is a mature capability – 29 aircraft in service with USN
- P-8A Sustainment Management Unit established within MPSPO



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USN P-8A Transition

- 3 operational deployments (Pacific)
- 29 aircraft accepted into operational service
- Middle East deployment planned for March 2016
- 5 of 12 USN VP SQNs operating P-8A
- 8900 sorties/49 000 hrs

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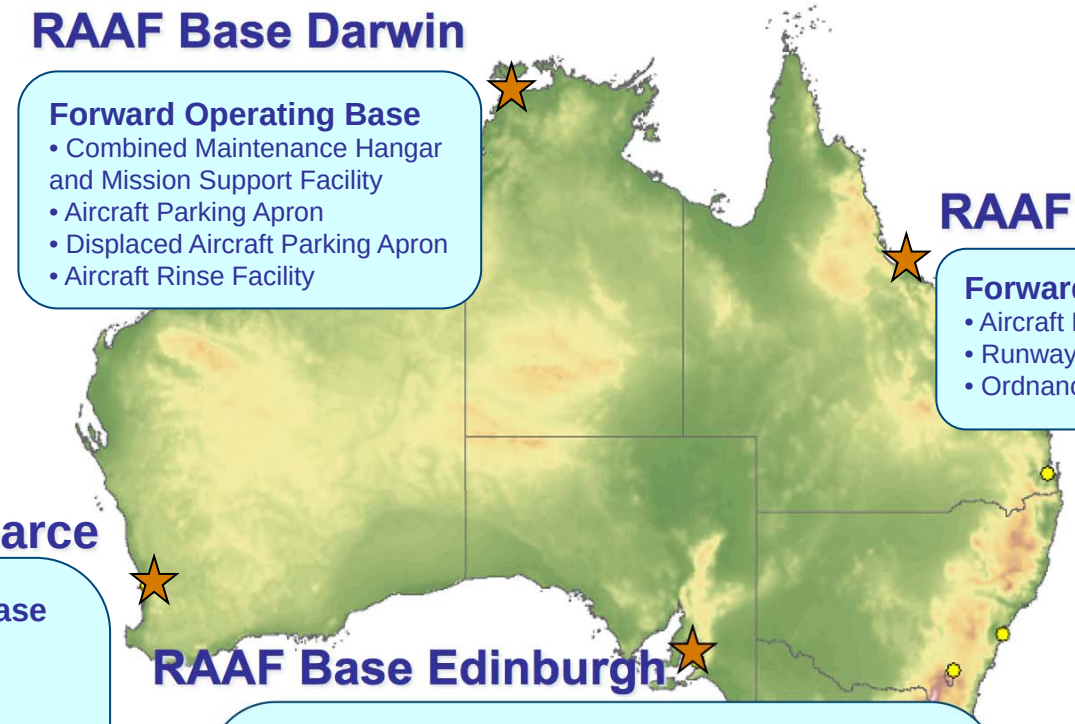
Operating Base Upgrades



RAAF Base Darwin

Forward Operating Base
- Combined Maintenance Hangar and Mission Support Facility
- Aircraft Parking Apron
- Displaced Aircraft Parking Apron
- Aircraft Rinse Facility

RAAF Base Townsville

Forward Operating Base
- Aircraft Rinse Facility
- Runway Extension
- Ordnance Loading Apron

RAAF Base Pearce

Forward Operating Base
- Aircraft Rinse Facility
- Runway Extension and Threshold Strengthening
- Aircraft Parking Apron
- Ordnance Loading Apron

* **HMAS Stirling** Upgrades
- New Explosive Ordnance Storage Facility
- Upgrade of Existing Torpedo Maintenance Facility

RAAF Base Edinburgh

Main Operating Base
- Aircraft Parking Apron
- Maintenance Hangar Facilities
- Mission, Maintenance and Logistics Support Facilities
- Operational Conversion Facility
- 92 Wing Headquarters
- Other Minor Facilities
- Runway Extension and Threshold Strengthening
- Taxiway Strengthening
- High Intensity Approach Lighting
- Temporary Facilities

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1950s


1980s

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RAAF Edinburgh Facilities

New 92WG Precinct:

- Hangars
- Tactical Ops Centre (TOC)
- Maintenance and Aircrew Training
- Crew Preparation and Briefing

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RAAF Darwin Facilities

New 92WG Precinct:

- Hangar
- TOC
- Crew Preparation and Briefing

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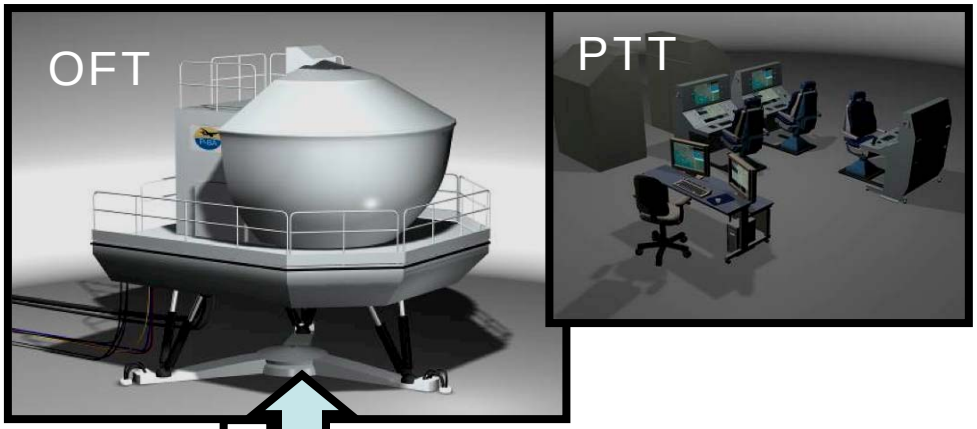
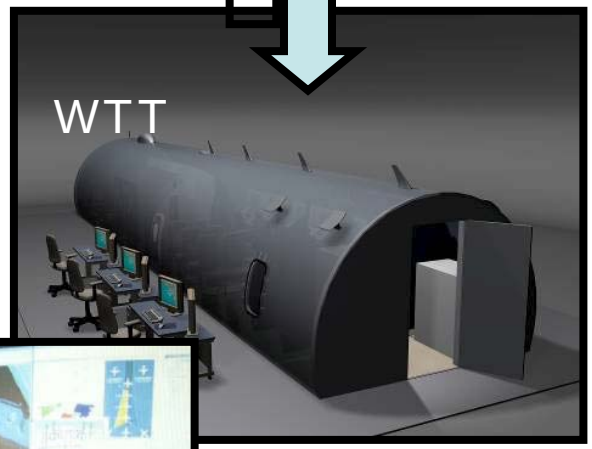
P-8A Training Devices

- Operational Flight Trainer (OFT) X 2
- Weapons Tactics Trainer (WTT) X 2
- Part Task Trainer (PTT)
- Virtual Maintenance Trainer (VMT)
- Ordnance Load Trainer (OLT)
- Maintenance Training Devices (MTD)





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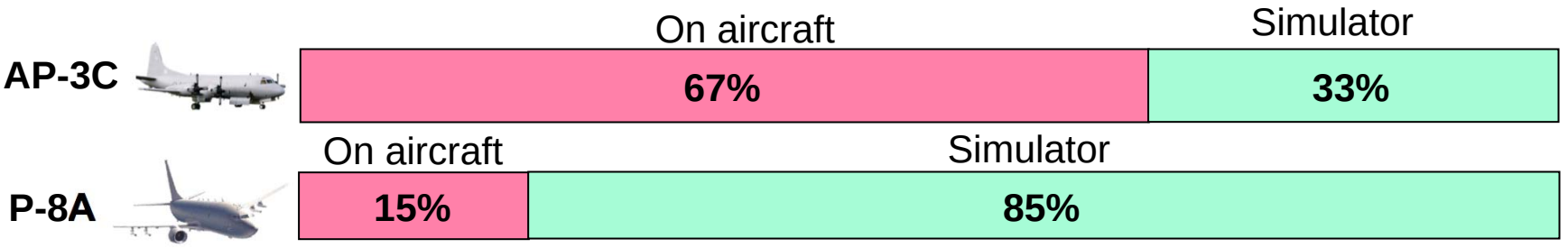
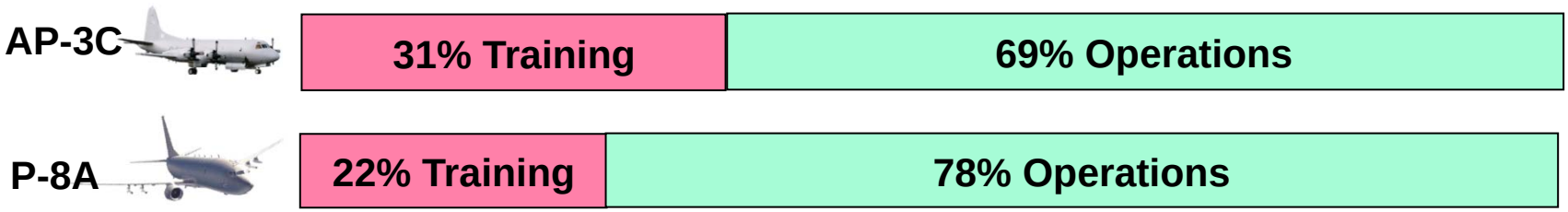
P-8A Aircrew Training

- **Dependency on high fidelity simulators**
  - Classified training in complex environments
  - Live training is an expensive venture, investment in simulator technology to reduce costs
  - Contemporary training paradigms

Pilot training hours



Operational flying hours



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Our P-8A Instructors with USN

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P-8A Poseidon Maintenance

Keeping the aircraft serviceable and able to fight

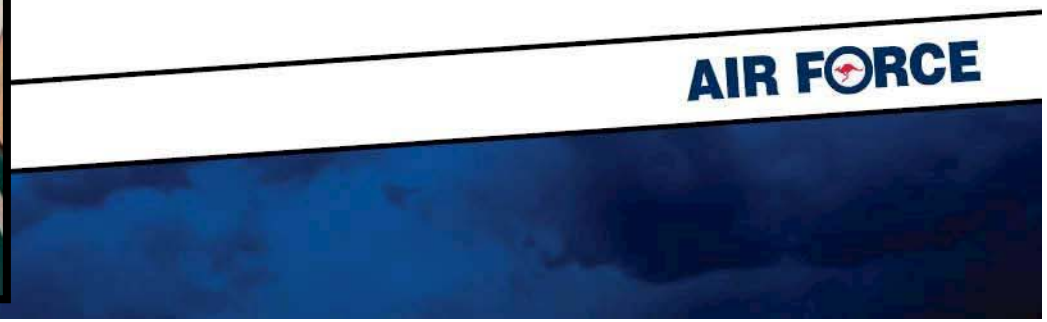
- **On-Aircraft Operational Maintenance (OM)**
  - **Conducted by uniformed personnel**
  - **Deliver operational capability**
  - **Scheduled and unscheduled**
  - **Maintenance on the aircraft**
- **Preventative Maintenance**
  - **Aircraft rinse**

MISRR Transition Office

P-8A Poseidon Maintenance

Keeping the aircraft serviceable and able to fight

- **On-Aircraft Deeper Maintenance (DM)**
  - **Scheduled, routine, major servicing.**
  - **Conducted by contractor.**
  - **Performed in Australia.**
  - **First due after six years of aircraft life.**



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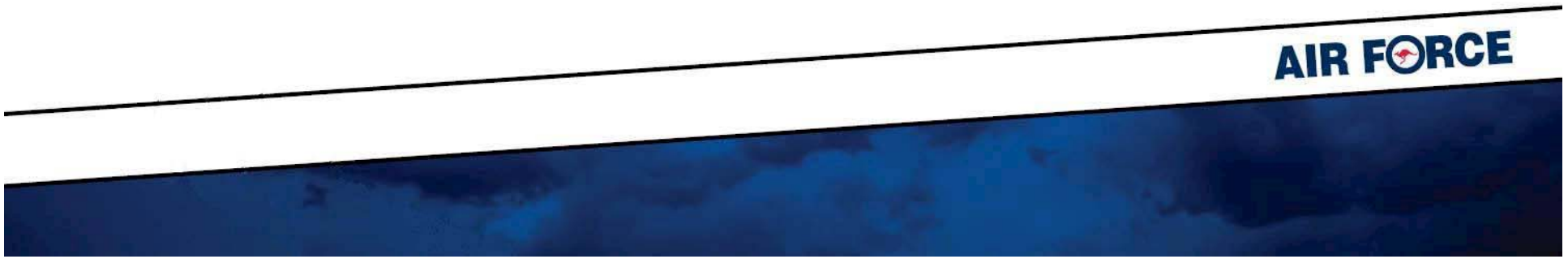
P-8A Overview



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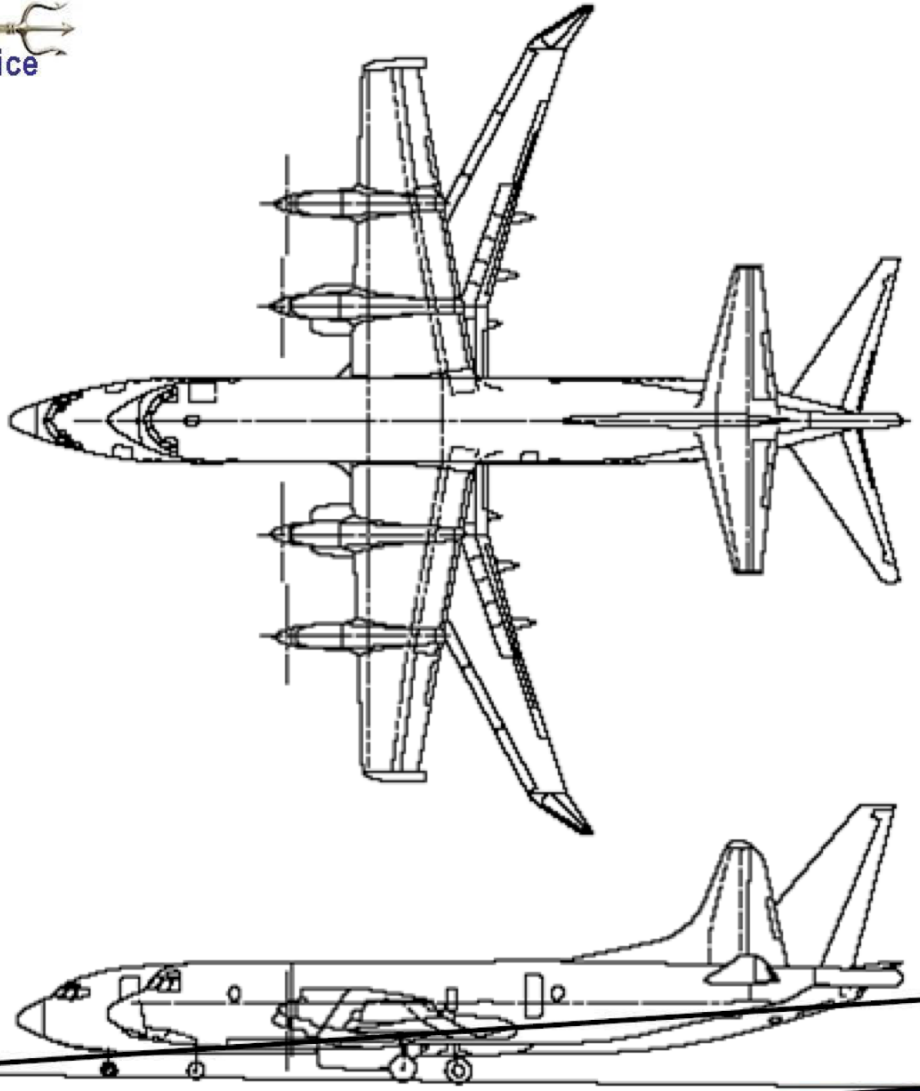
P-8A to AP-3C Comparison



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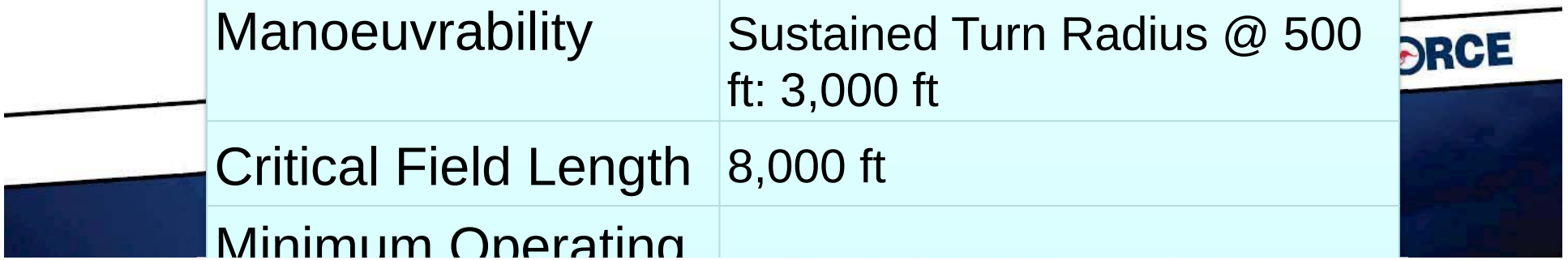
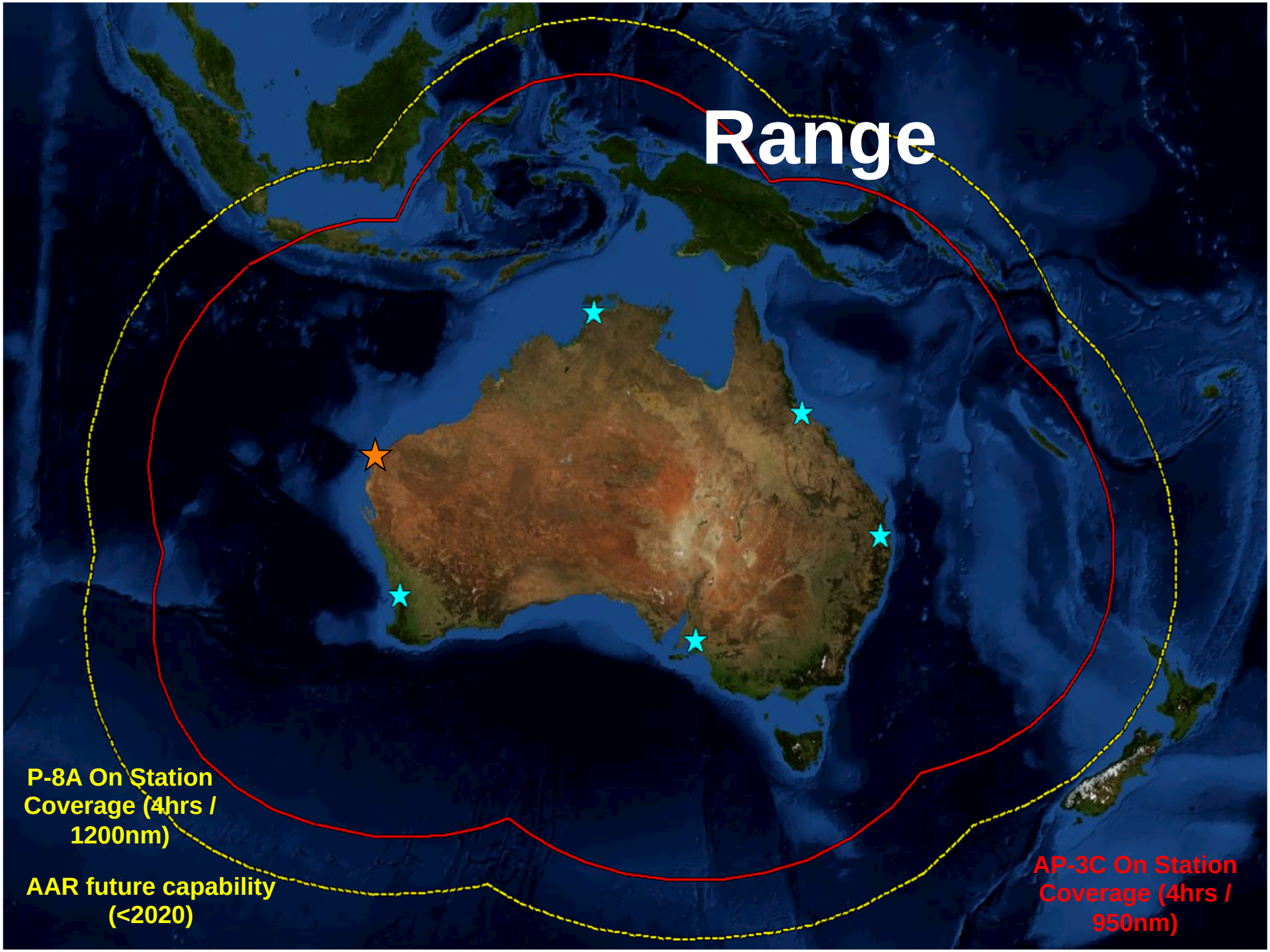
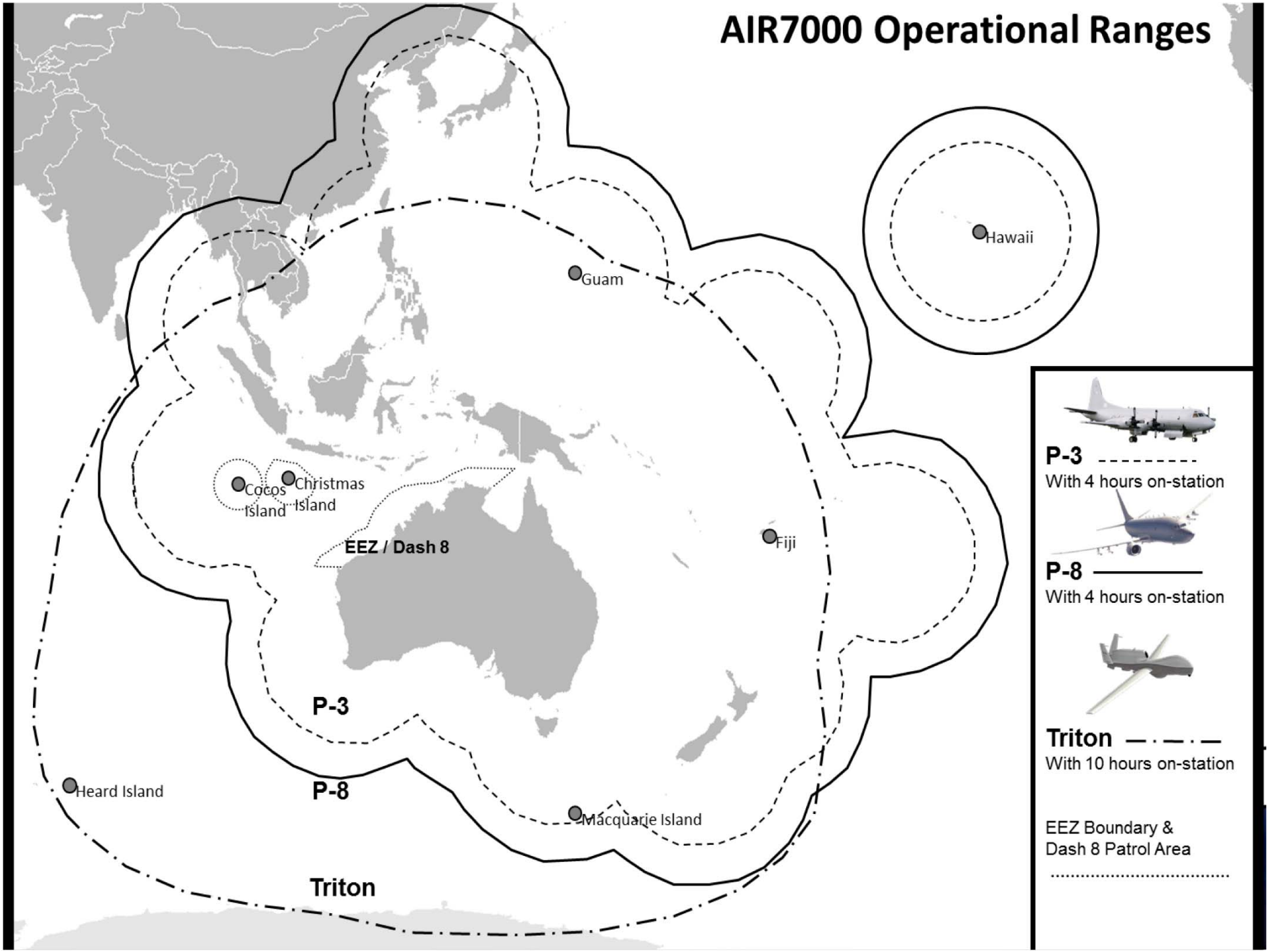
Boeing P-8A Poseidon

Performance Requirements	
Mission Radius/ Endurance (ASW)	1,200 nm / 4 hr on station (Unrefueled)
Stores Load	10,000 lbs capacity
Self-Deployment	4,000 nm
Speed	Average Transit Airspeed (TAS): 340 KTS Maximum Airspeed (TAS): 400 KTS
Manoeuvrability	Load Factors: +2.2g/-0.5g Sustained Turn Radius @ 500 ft: 3,000 ft
Critical Field Length	8,000 ft
Minimum Operating	




Range
P-8A On Station Coverage (4hrs / 1200nm)
AAR future capability (<2020)
AP-3C On Station Coverage (4hrs / 950nm)

AIR7000 Operational Ranges



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Boeing P-8A Poseidon

- Based on the Boeing 737-800 with 737-900 wings
- Heaviest 737 aircraft in the world
- Purpose built military aircraft – major changes to commercial 737
  - Not a modified commercial aircraft.

737-800/900 to P-8A – Major System Changes

- Frame
- Propulsion Power
- Wiring
- ECS
- Hydraulics
- Oxygen
- Fire Detection
- Fuel
- Weapons
- Acoustic Sonobuoys
- Interior/Avionics
- ALE47 Dispenser
- EO/IR
- Antennas

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737-800 Flight Deck with P-8A Modifications

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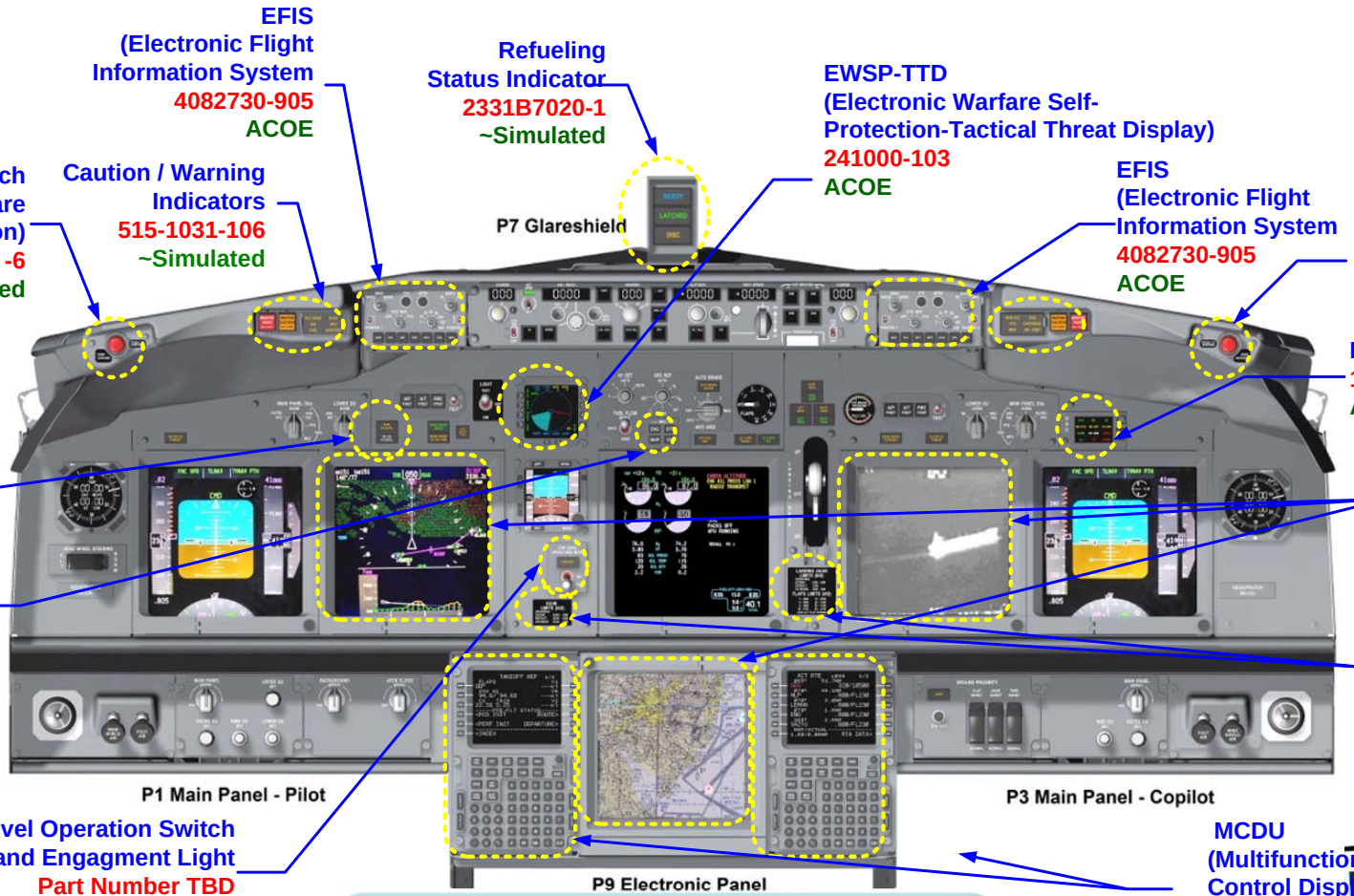
P-8A vs 737NG



P-8A Differences

(Compared to a Standard 737-800)

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Head Up Display (HUD)

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Aircraft Systems

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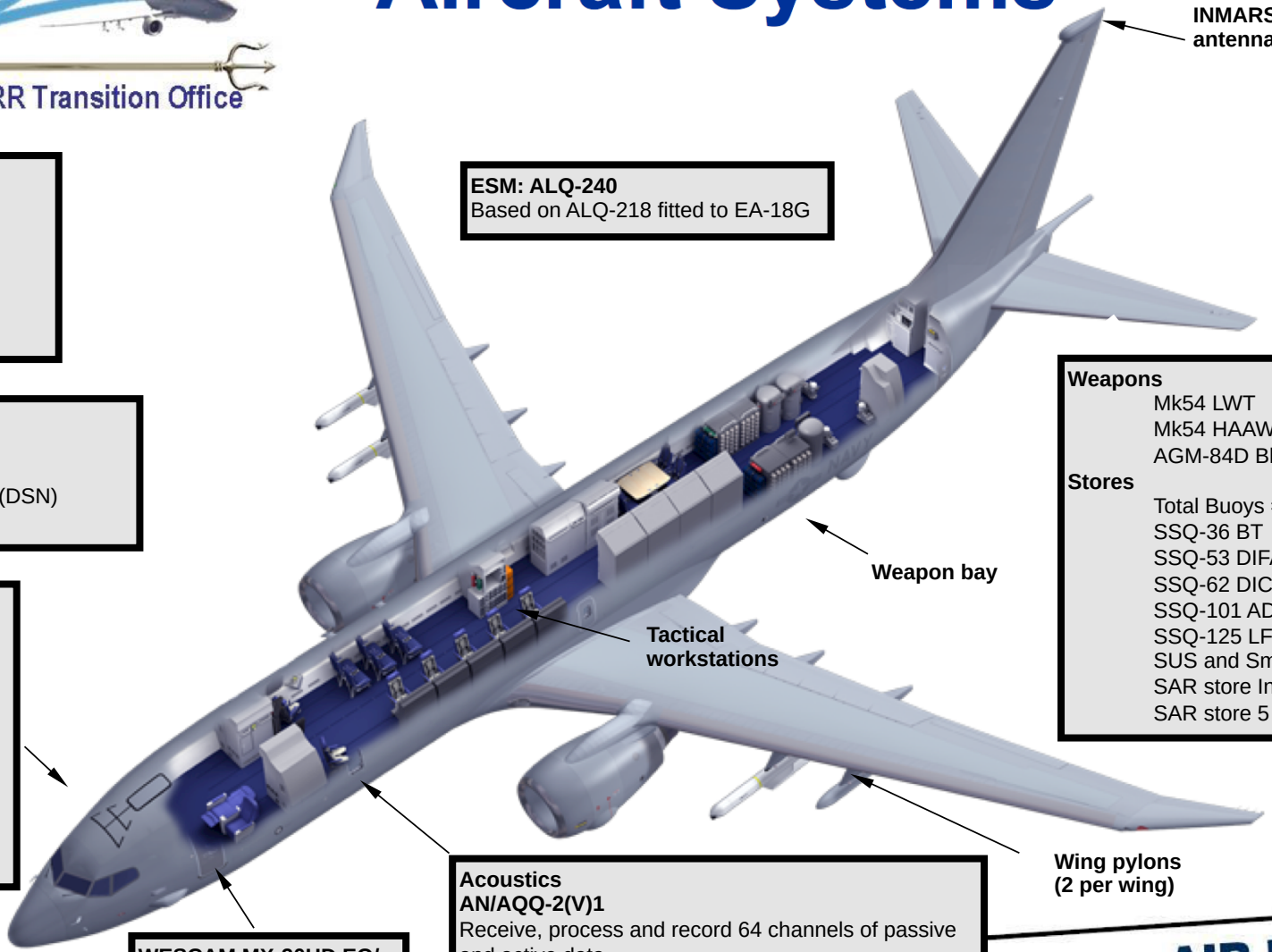
Plain Voice
VHF x 2
INMARSAT
Secure Voice
V/UHF x 3
HF x 1
UHF/SATCOM x 2

TCDL
LINK 16
INMARSAT
BLOS IP SIPRNET/(DSN) connectivity

Multimode radar
AN/APY-10
Surface Search
Periscope Detection
Color Weather Nav
ISAR
SAR
240 deg
Track-While-Scan
256 contacts
IFF interrogation

ESM: ALQ-240
Based on ALQ-218 fitted to EA-18G



Weapons
Mk54 LWT
Mk54 HAAWC (2020)
AGM-84D Block 1C
Stores
Total Buoys = 126
SSQ-36 BT
SSQ-53 DIFAR
SSQ-62 DICASS
SSQ-101 ADAR
SSQ-125 LFCS
SUS and Smokes (Mk25/Mk58)
SAR store Initial 2 x 8-10 pers
SAR store 5 x 20 pers (2018)

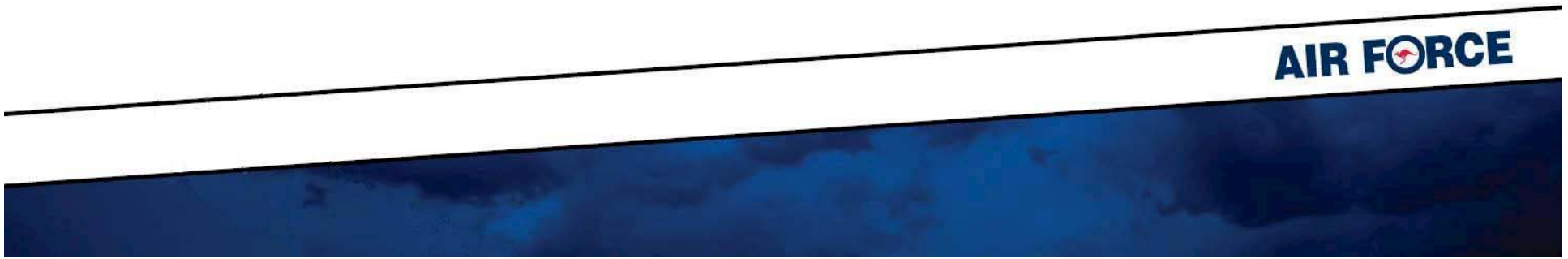
WESCAM MX-20HD EO/ IR Turret
EO
HD 1280x1024
IR
SD 640x512

Acoustics
AN/AQQ-2(V)1
Receive, process and record 64 channels of passive and active data
Concurrently process multiple buoy types and modes
Receive, collect, analyze, and disseminate environmental data
Inbuilt Classification
GPS buoys
Multi-static Active Coherent

MISRR Transition Office

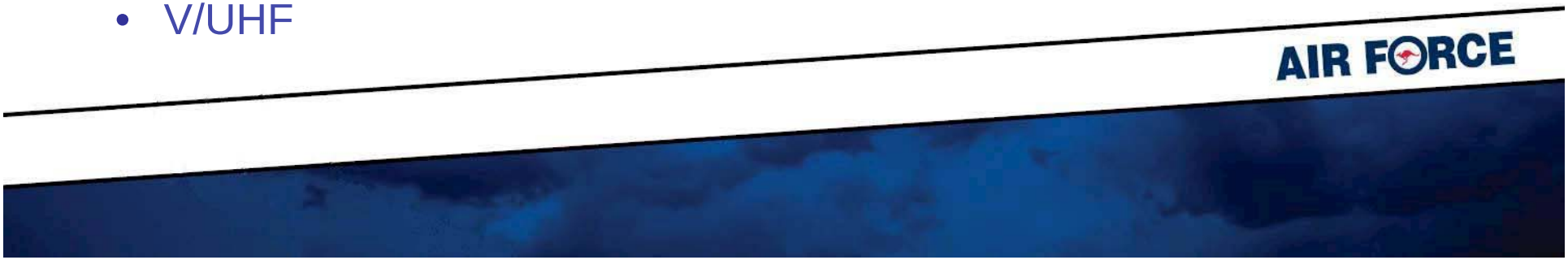
Crew

- Pilot (P)
- Co Pilot (CP)
- Tactical Coordinator (TACCO)
- Co-Tactical Coordinator (COTAC)
- Sensor Operators:
  - Acoustic Air Warfare Operators (AAW)
  - Electronic Air Warfare Operators (EW)
- **AP-3C differences**: No Flight Engineer or Sensor Employment Manager



P-8A Communications

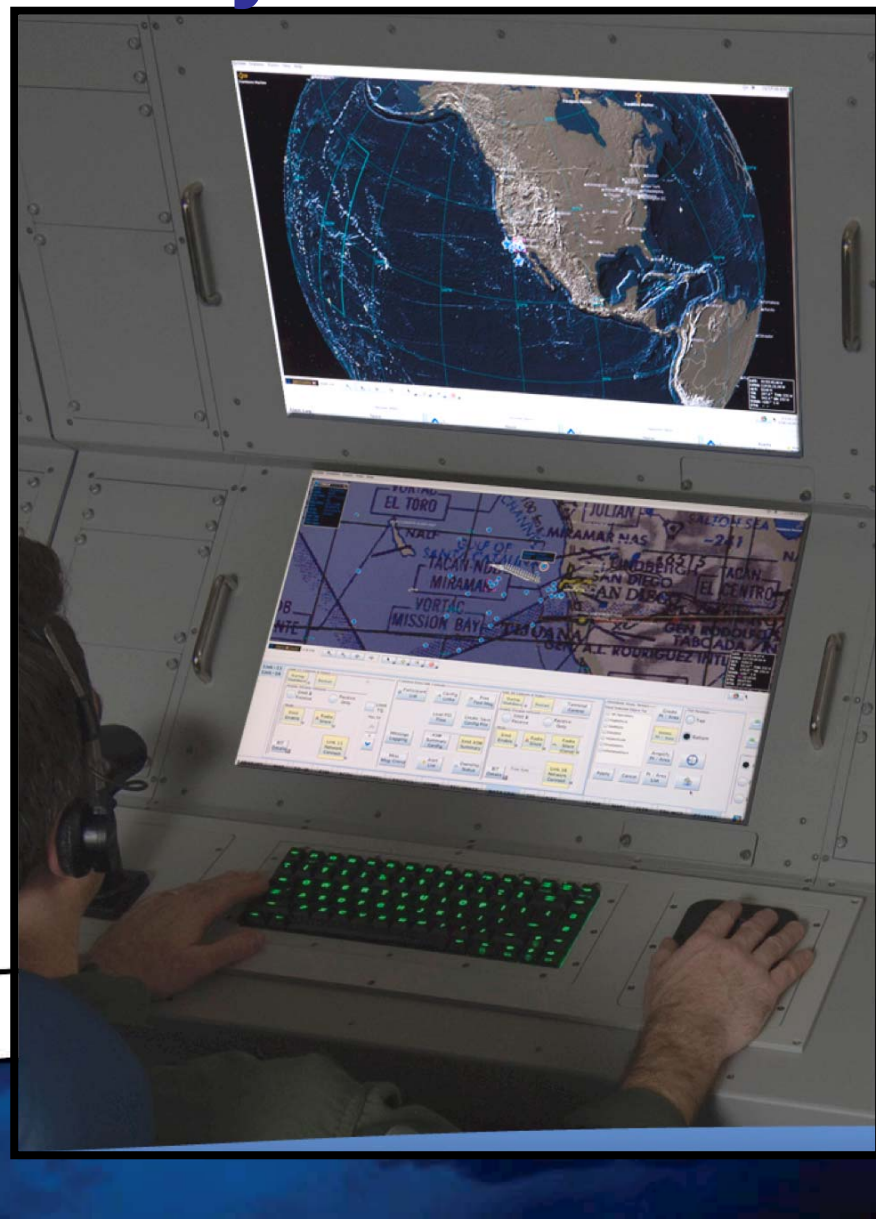
- Plain Voice
  - VHF x 2
  - INMARSAT
- Secure Voice
  - V/UHF x 3
  - HF x 1
  - UHF/SATCOM x 2
- Link 11
  - U/HF, SATCOM
- Link 16
  - Incl Link 11/16 Data forwarding
  - 2 voice channels
  - V/UHF
- IBS, GCCS
- AIS
- TCDL
  - Ku and X band
  - IP capable
- INMARSAT
  - BLOS IP @ 432kbps
  - SIPRNET/(DSN) connectivity
    - Email, IM, chat, web browsing posting
  - ACARS



MISRR Transition Office

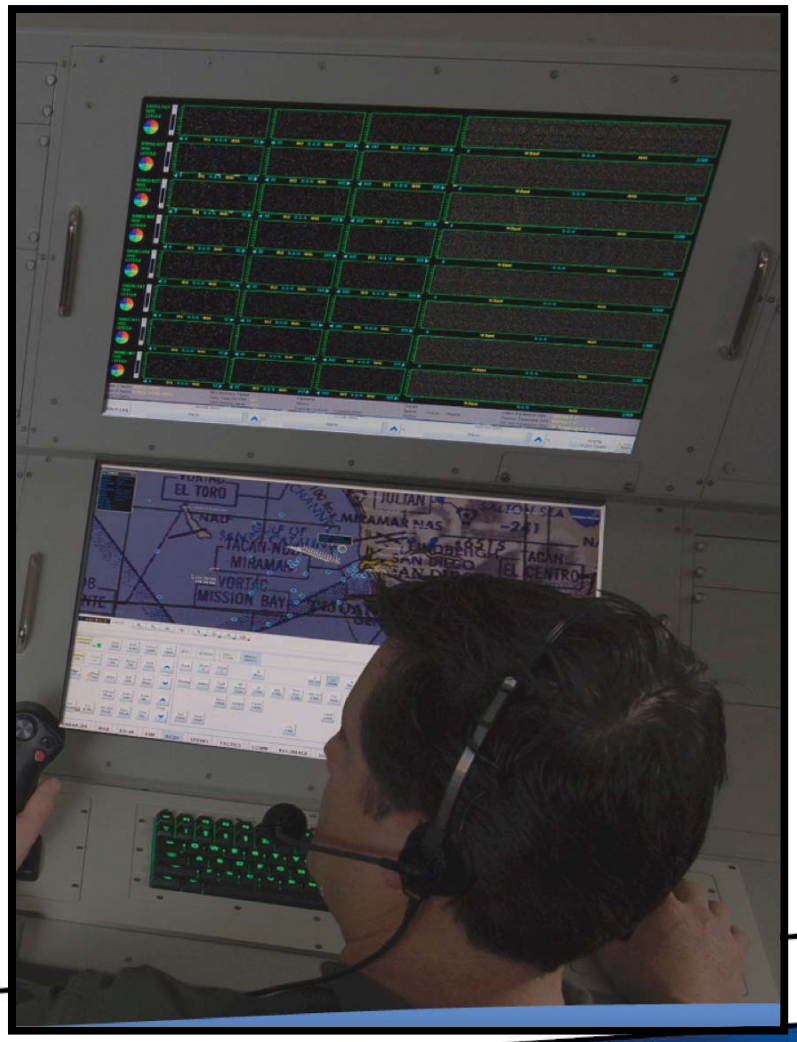
Mission Computing and Display Subsystem

- Dual ultra-high-resolution 24-in diagonal screens
- Common tactical situation display for all operators
- Displays all on-board and off-board track data in one view
- Multiple layers with variable transparency for maps and tactical overlays
- Operator-customized display settings and filters



MISRR Transition Office

ACOUSTICS



- Receive, process and record 64 channels of passive and active data
- Concurrently process multiple buoy types and modes
- Receive, collect, analyze, and disseminate environmental data
- Inbuilt Classification
- GPS buoys (future)
- High-resolution color presentation
- Sonobuoy Positioning System
- Multi-static Active Coherent

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MISRR Transition Office

APY-10 RADAR

- **Multi-Mode Surveillance Radar**
  - Based on APS 137D (V5)
  - Surface Search
  - Periscope Detection
  - Color Weather/Navigation
  - Multi-Target Track-While-Scan (256 contacts)
  - Inverse Synthetic Aperture (ISAR)
  - Synthetic Aperture Radar (SAR)
  - Maritime Strike Targeting

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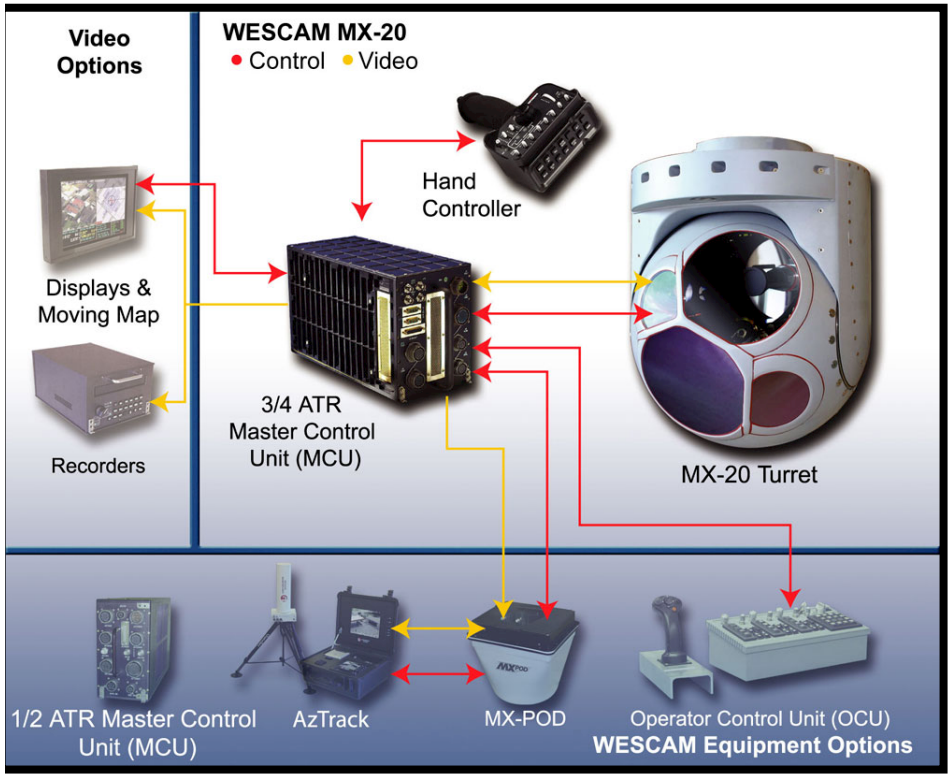
Electro-Optical/Infrared



MX-20HD

- Modular Payload
  - High Definition (HD) Electro-Optic and Infrared (SD) imaging sensors
  - Highly Stabilized
- Onboard Image Processing (gain, level, contrast)
- Color day camera
  - Zoom lens
- Monochrome day camera
  - Four fields of view (focal lengths)
  - High resolution
- Infrared night camera
  - Four fields of view

AIR FORCE

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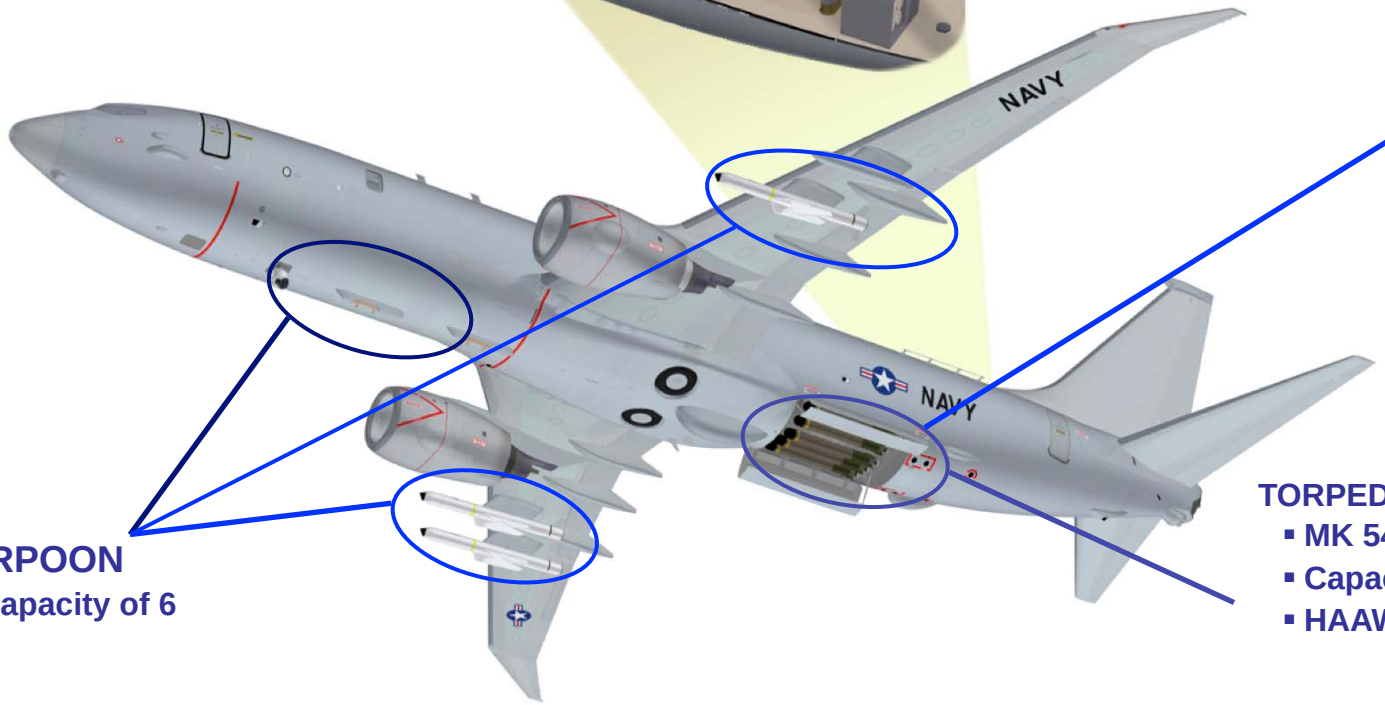
Weapons and Stores



SAR KIT
- Interim 2016
- Capacity of 2
- Full P-8A SAR Kit 2018
- Capacity of 5

TORPEDO
- MK 54
- Capacity of 5
- HAAWC (2018-19)

HARPOON
- Capacity of 6

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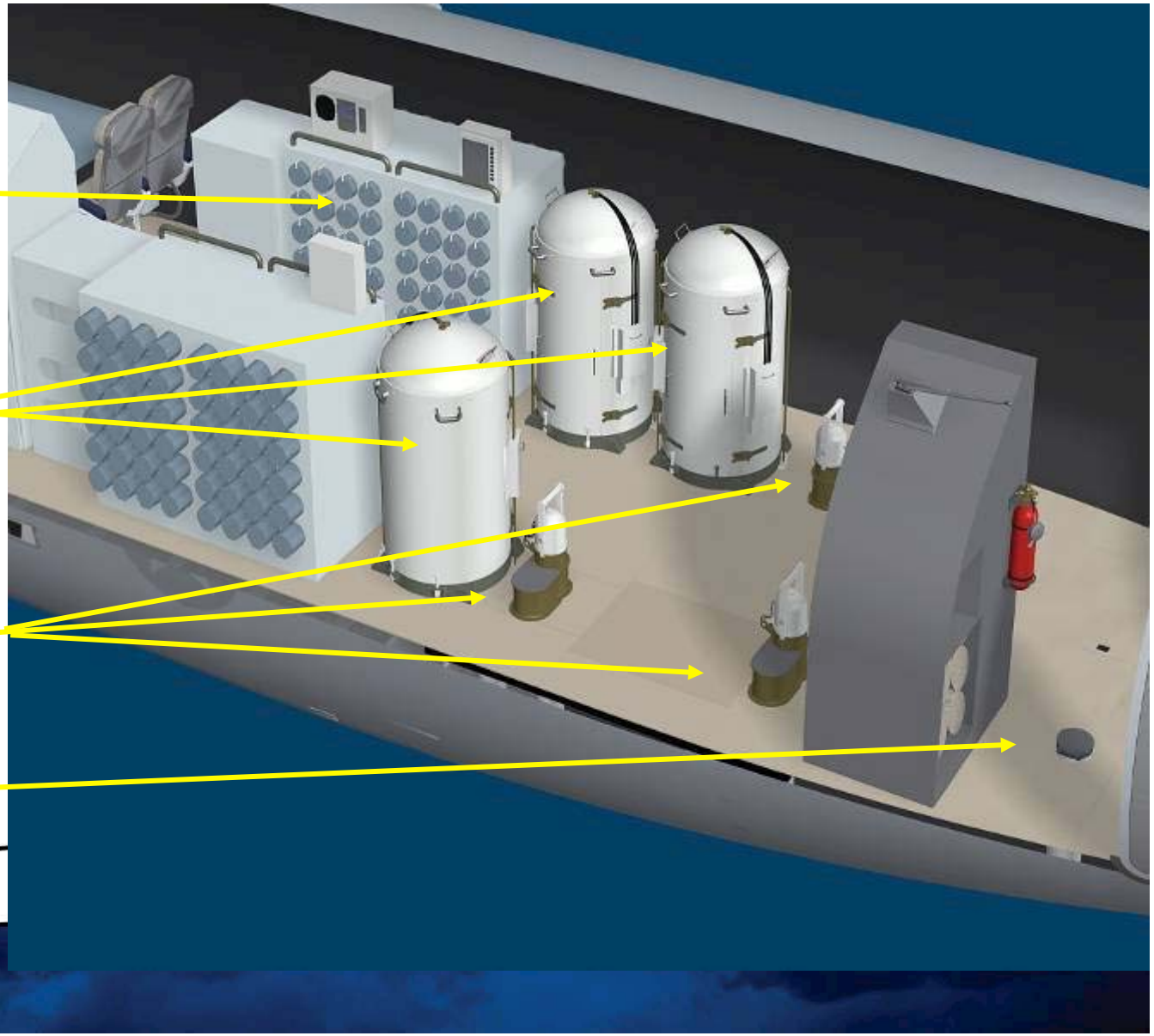
Ordnance System



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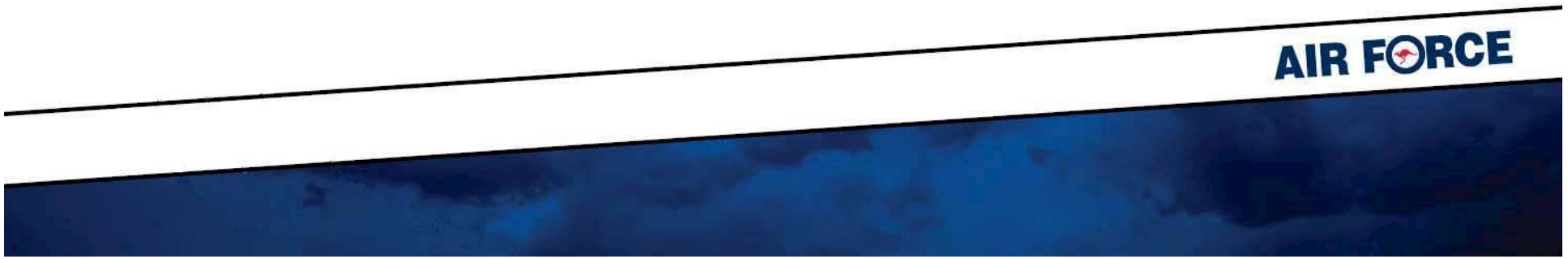
EWSP System

- LAIRCM
  - AN/AAR-54 Missile Warning Sensors and processors that detect missile launches and provide missile data to the EWSP
  - AN/AAQ-24(V) LAIRCM Processor that provides overall control and allocation of jamming
  - AN/AAQ-24(V) Guardian Pointer Tracker Assembly that performs closed loop fine tracking of an IR missile for the Viper Laser
  - AN/AAQ-24(V) Viper Laser that provides a modulated all-band mid IR laser signal to jam missile's tracking device
- ALE-47 CMDS



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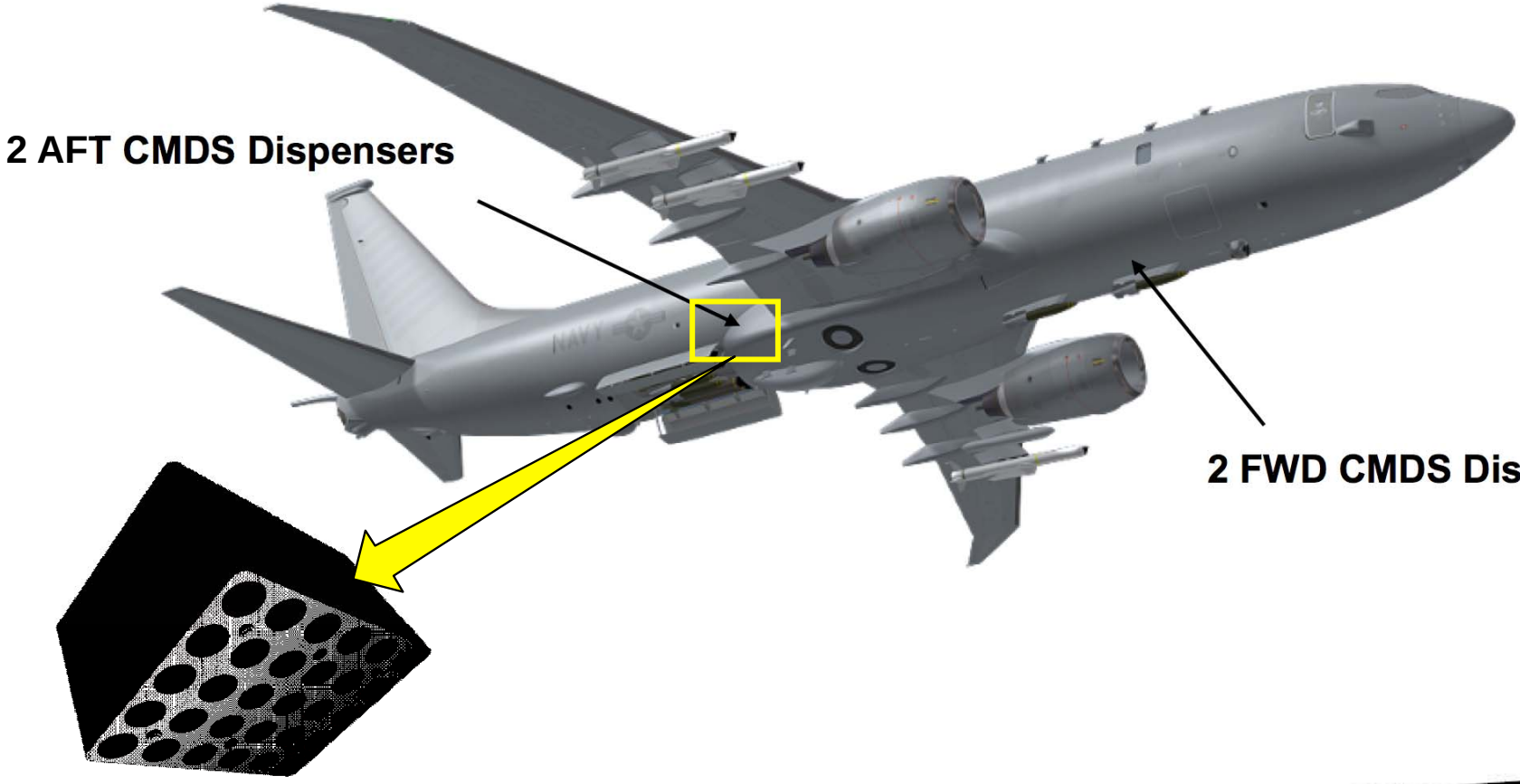
Counter Measure Dispensing System (ALE-47)



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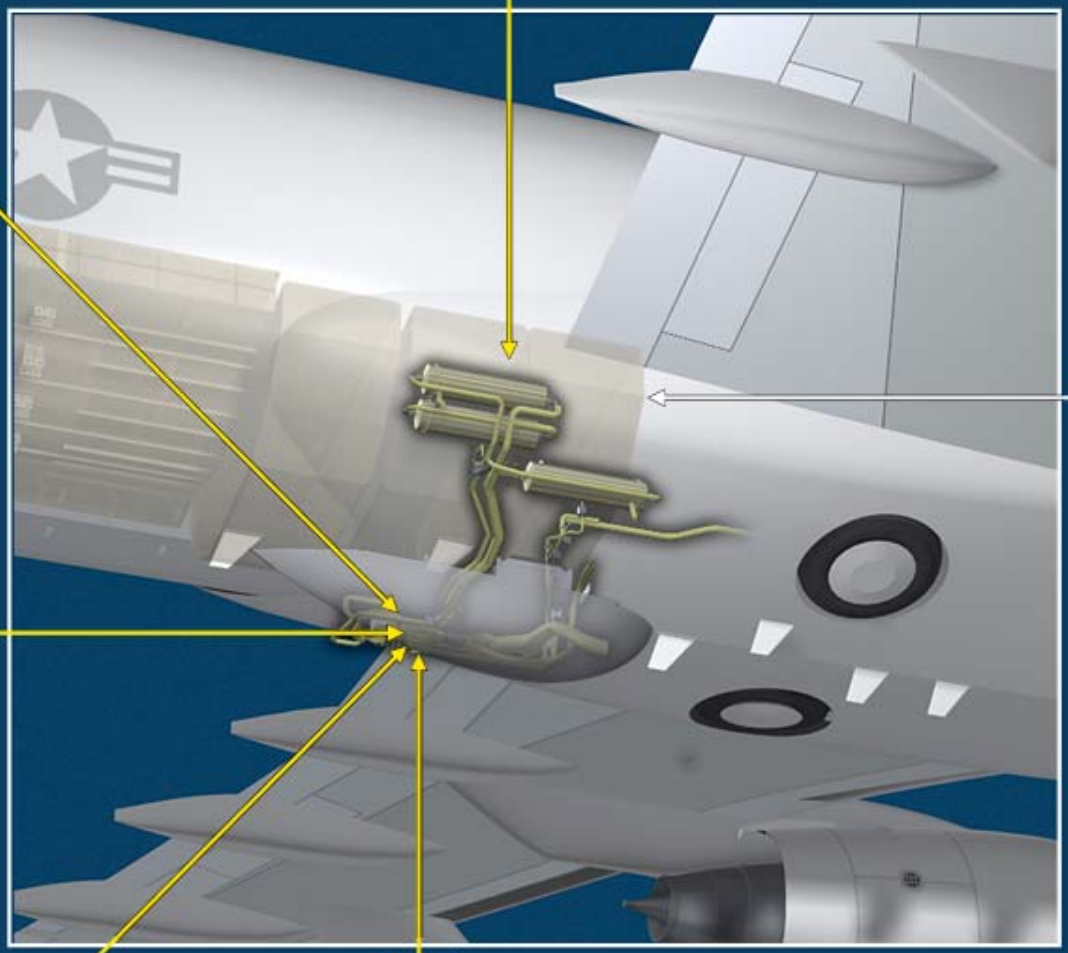
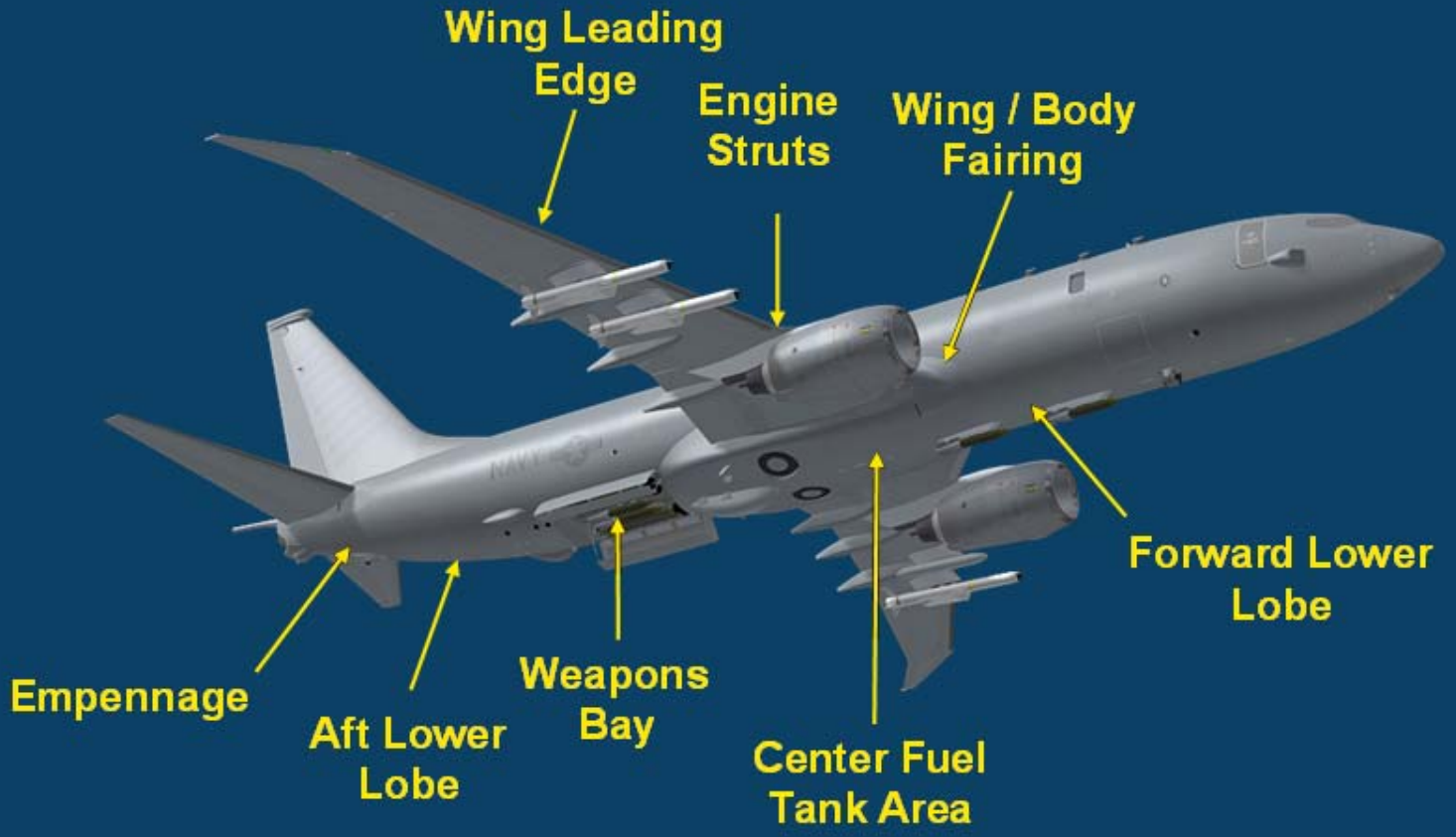
Fire Protection - OBIGGS

- Major components



Fire Protection - Dry Bay Suppression

- Dry Bay Compartments
  - Fuel Line Passage
  - Adjacent to Fuel



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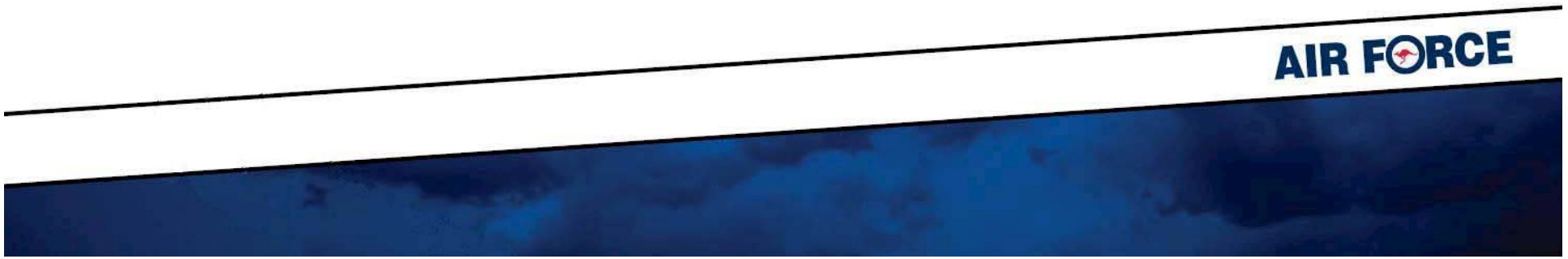
What does P-8A bring to the fight?

- Improved serviceability (noting reduced numbers)
- Improved weapons and sensors (esp. ASW)
- Improved integration of systems onboard
- Increased connectivity – speed of C2 and ISR products – increasing in future
- Overall enhanced ISR capability (with Triton)



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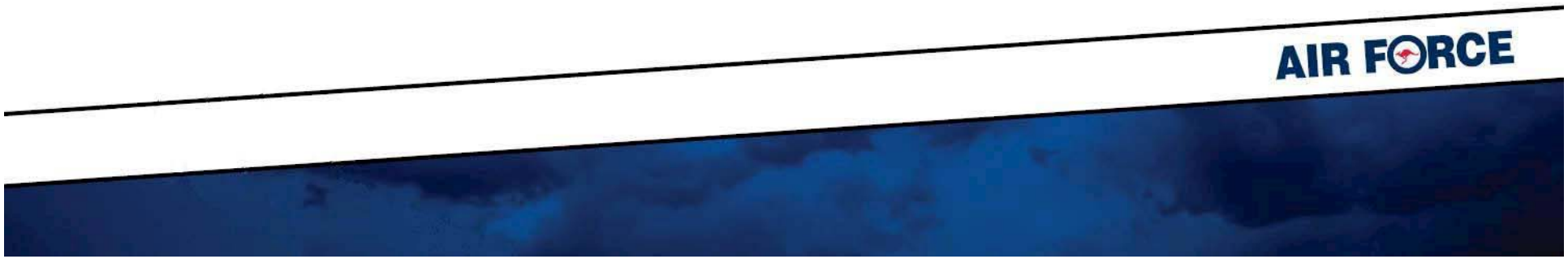
Future Development



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Family of Systems to replace AP-3C Orion

12

P-8A

Poseidon

AIR 7000 Ph2B

Response

Maritime Patrol

Multi Mission Sensor Suite

Large Weapon Payload

Complementary

6

AIR 7000 Ph1B

Persistent

Long Range ISR

Search Sensor Suite

C4I Network Node

MQ-4C

Triton

Anti Submarine Warfare
Search, Track, Attack

Anti Surface Warfare
Attack

Search and Rescue

Anti Surface Unit Warfare

Search, Identify

Track

Maintain the

Maritime Picture

ISR Support

to Government

Intel Data

available across DSN

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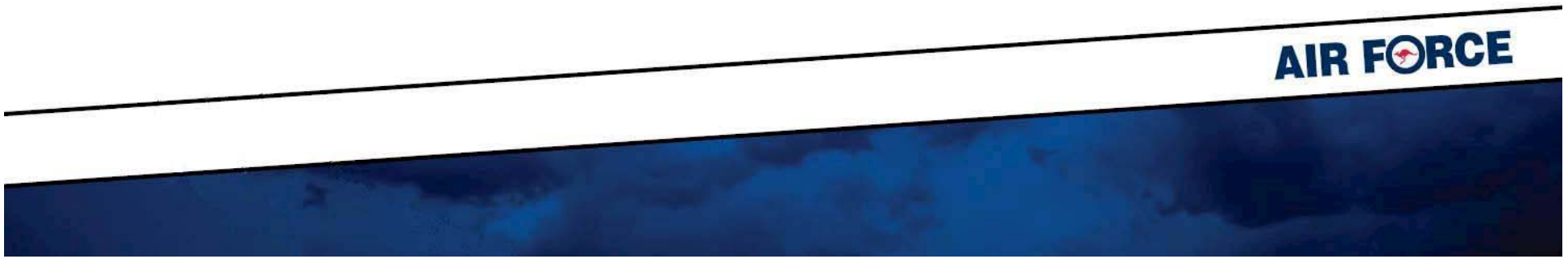
P-8A Future Development

- Increased networked operations (ISR info, weapons)
- Sensor and weapon improvements
- Increased data fusion
- Open Systems Architecture for rapid updates
- Collaborative development with MQ-4C Triton (sensors, data fusion, networks)



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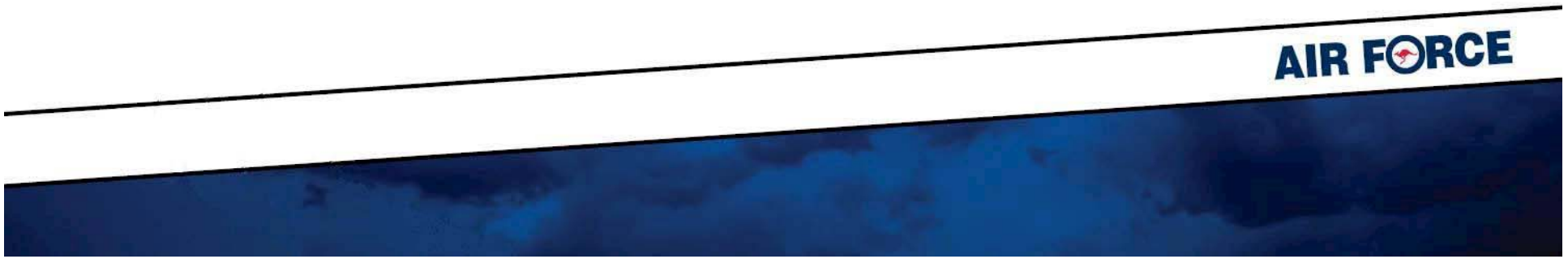
Key Takeaways

- Importance of Maritime Patrol capability
- P-8A transition on track and getting close
- 12 x P-8A required + Triton
- USN partnership
- P-8A/Triton future co-development
- Exciting future for MPA community!



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Questions?

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P-8A Poseidon Aircrew Training

- **Dependency on high fidelity simulators**
  - Classified training in complex environments
  - Operational Flight Trainers
  - Weapons, Tactics and Techniques Trainers
- **Secure classrooms**
  - Specialised Computer Based Learning
  - Electronically Mediated Lectures
    - Mass briefings
- **Part Task Training Device**
- **Ability to tailor training**
  - Supporting personnel
  - Training development tools

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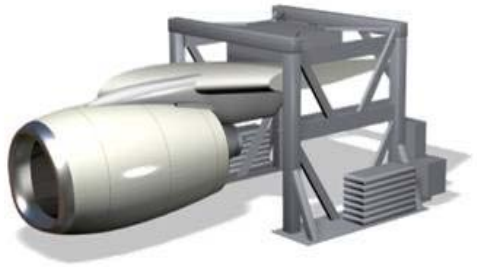
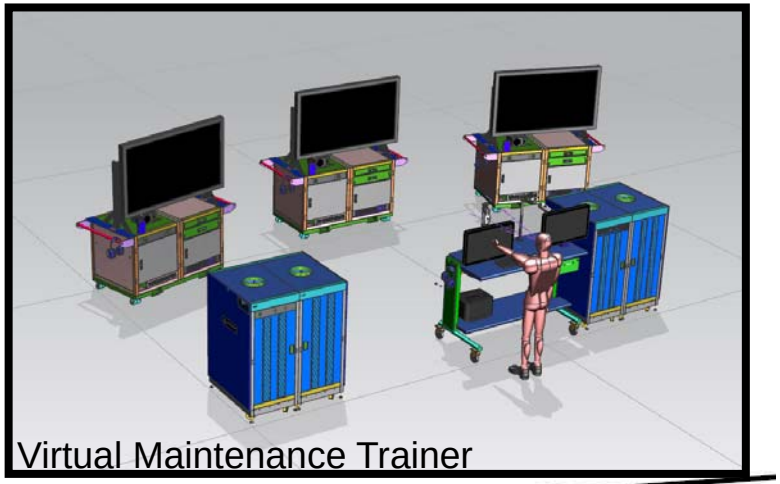
P-8A Poseidon Maintenance Training

Specialist instruction on P-8A System and Tasks

- Classrooms
  - Computer based learning
  - Electronically Mediated Lectures
- Specialist Training Aids
  - Virtual Maintenance Trainer
  - Ordnance Load Trainer
- Maintenance of training capability
  - Support personnel
  - Development tools





Virtual Maintenance Trainer

Ordnance Load Trainer

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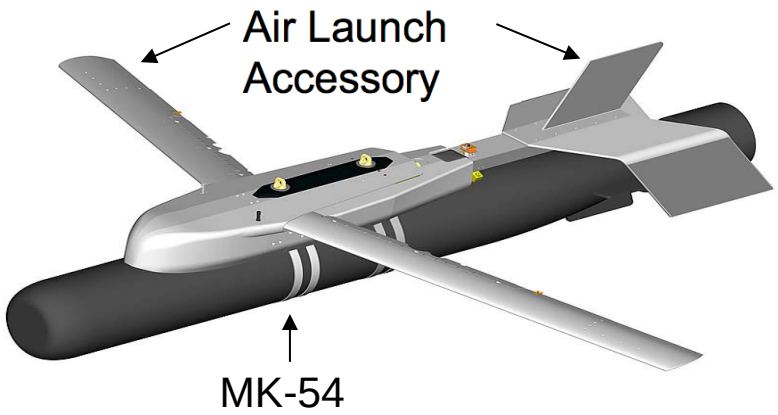
High-altitude ASW

- P-8A will be capable of conducting conventional low-level ASW, however
- High-altitude operation has potential for:
  - Greater horizon
  - Enhanced SA
  - Increased survivability
  - Increased flexibility
- Requires:
  - Sensor improvements (Increment 2)
  - Weapon envelope expansion
  - Procedures/Tactics adjustment
  - High Alt Wpn (HAAWC) ~ 2018/19



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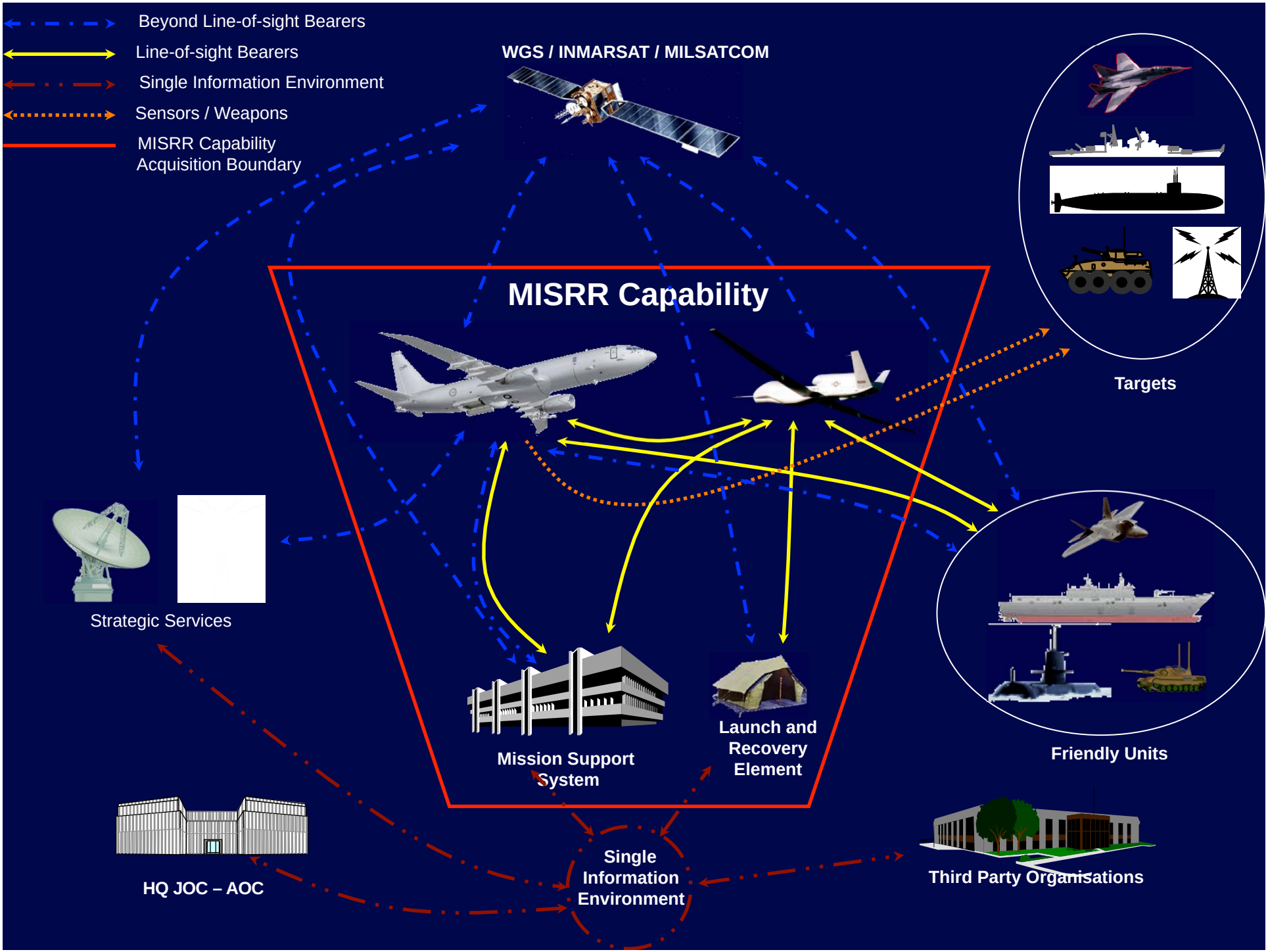
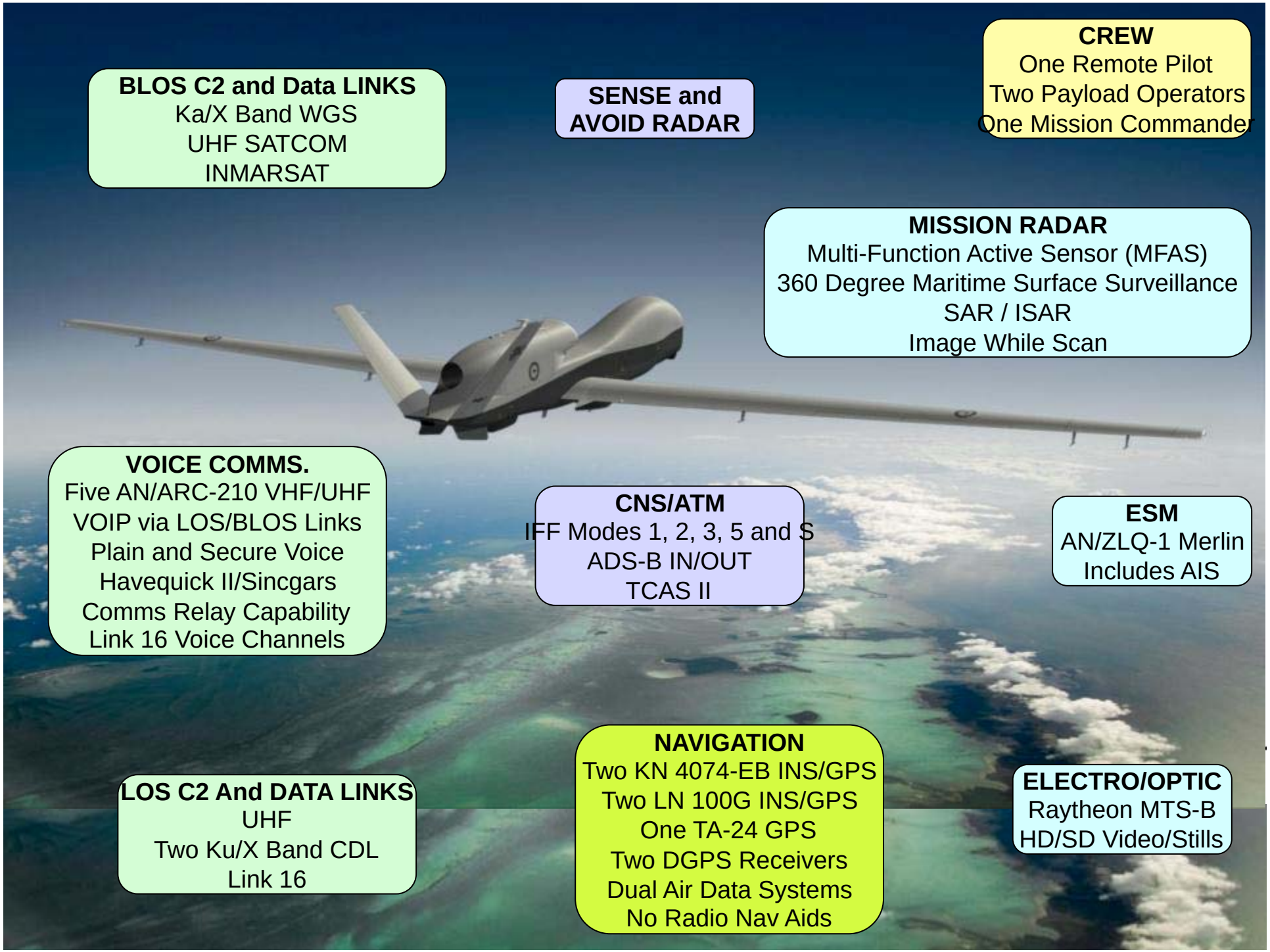

Beyond Line-of-sight Bearers
Line-of-sight Bearers
Single Information Environment
Sensors / Weapons
MISRR Capability Acquisition Boundary
WGS / INMARSAT / MILSATCOM
MISRR Capability
Targets
Strategic Services
Mission Support System
Launch and Recovery Element
Friendly Units
HQ JOC – AOC
Single Information Environment
Third Party Organisations


BLOS C2 and Data LINKS
Ka/X Band WGS
UHF SATCOM
INMARSAT
SENSE and AVOID RADAR
CREW
One Remote Pilot
Two Payload Operators
One Mission Commander
MISSION RADAR
Multi-Function Active Sensor (MFAS)
360 Degree Maritime Surface Surveillance
SAR / ISAR
Image While Scan
VOICE COMMS.
Five AN/ARC-210 VHF/UHF
VOIP via LOS/BLOS Links
Plain and Secure Voice
Havequick II/Sincgars
Comms Relay Capability
Link 16 Voice Channels
CNS/ATM
IFF Modes 1, 2, 3, 5 and S
ADS-B IN/OUT
TCAS II
ESM
AN/ZLQ-1 Merlin
Includes AIS
LOS C2 And DATA LINKS
UHF
Two Ku/X Band CDL
Link 16
NAVIGATION
Two KN 4074-EB INS/GPS
Two LN 100G INS/GPS
One TA-24 GPS
Two DGPS Receivers
Dual Air Data Systems
No Radio Nav Aids
ELECTRO/OPTIC
Raytheon MTS-B
HD/SD Video/Stills

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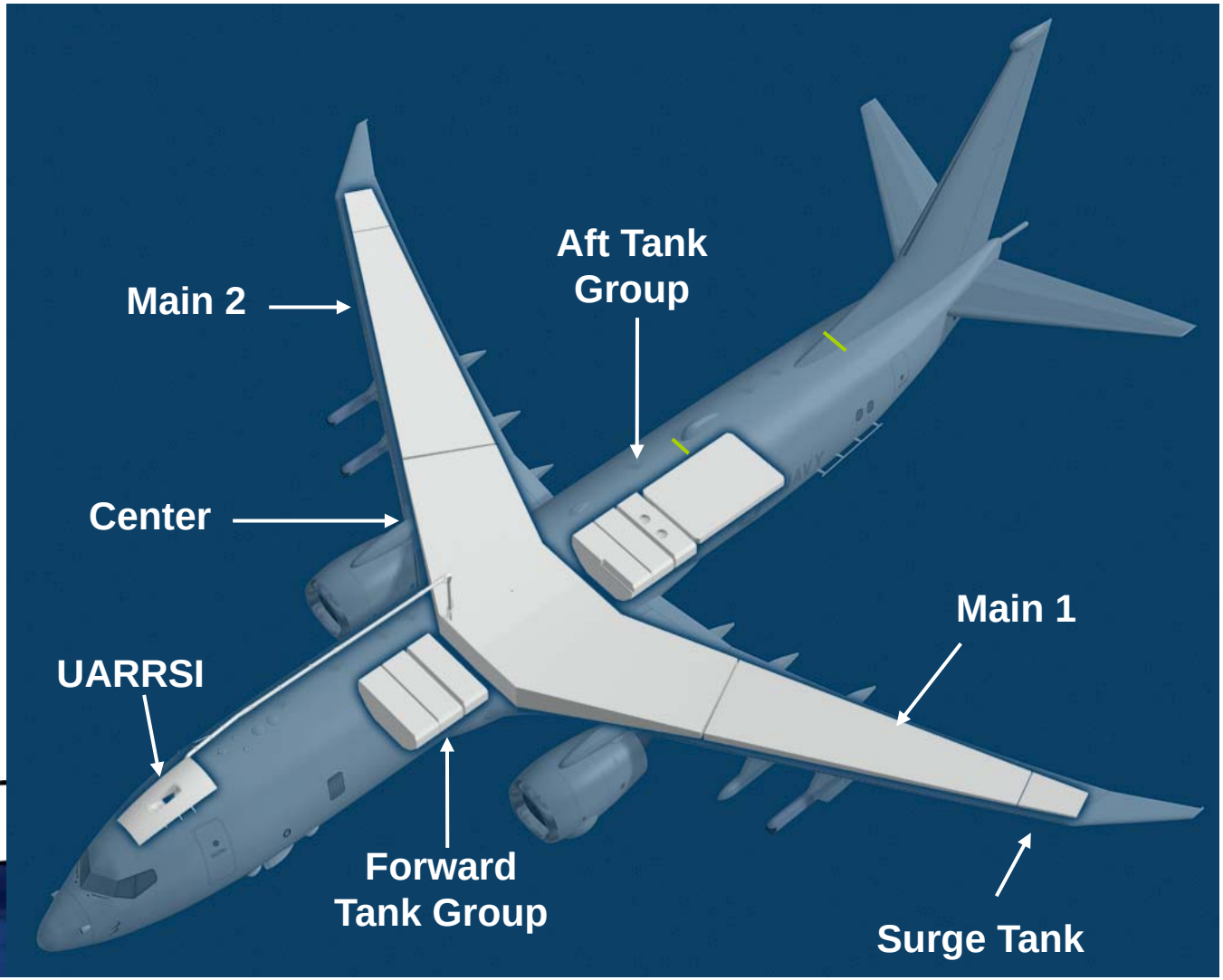
Fuel System

- Main Tanks
  - Main 1: 1,288 gal
  - Main 2: 1,288 gal
  - Center: 4,300 gal
- Aux Tanks
  - Fwd Gp: 1,563 gal
  - Aft Gp: 2,575 gal
- Total Fuel Capacity



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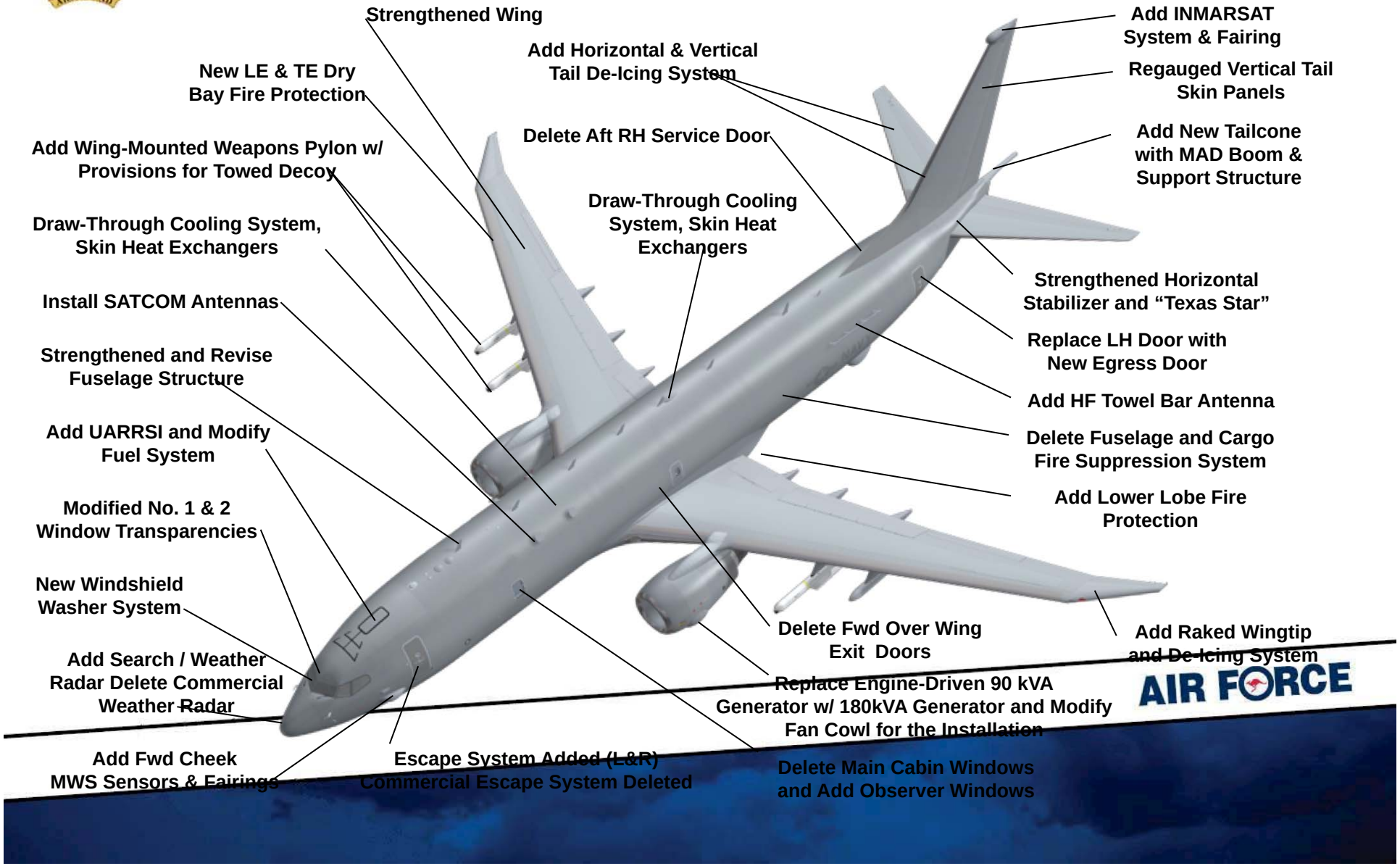
P-8A Principal Characteristics

Changes Relative to 737-800 (top Exterior view)



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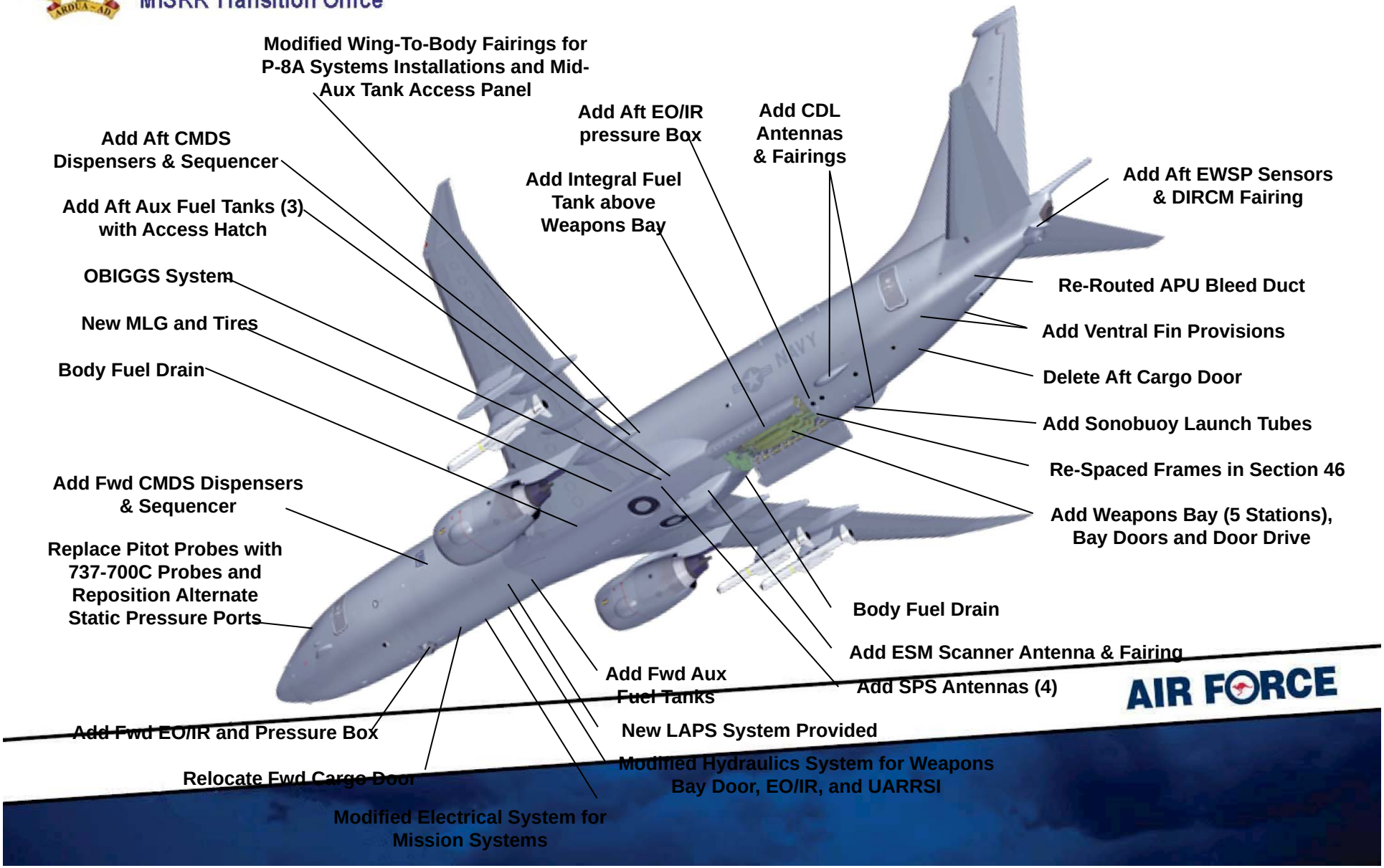
P-8A Principal Characteristics
Changes Relative to 737-800 (bottom Exterior view)



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P-8A Principal Characteristics
Changes Relative to 737-800 (Interior view)