ITALIAN AIR FORCE

4th & 5th GEN. A/C INTEGRATION
ADVANCED TRAINING APPROACH

Brig.Gen. Luigi DEL BENE
ItAF AIR STAFF
CHIEF of the 3rd DEPARTMENT

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AGENDA

- **Introduction**
- **4th & 5th Generation Characteristics**
- **Advanced Training Implications**
- **Take Aways – Questions**
SCENARIO IMPLICATIONS

- Anti Access/Area Denial (A2/AD)
- Hybrid Threats
- Hybrid Aerial Threats

Past

4th gen fighters and bombers delivering direct attack PGMs in permissive operating environments

Present, Future

Penetrating aircraft delivering stand-off PGMs in contested environments

Darker red = higher threat areas
4th GENERATION AIRCRAFT

- Multi role / Swing role
- Good array of guided weapons
- Federated information architecture
- NO Low Observable capable
5th GENERATION AIRCRAFT

- Extended Command & Control (C2) node in the battlespace
- Information Superiority to enable better Decision Making process
- Low Observable *by design*
- Sensor Fusion *by design*
- OMNI role

Harrier
USMC / RAF
RN / ItN

Tornado
RAF / ItAF

F-4
JASDF/TurAF

F-16
USAF / RNAF / RDAF / TurAF / RNAF / IAF / RSAF

F/A-18
USN / USMC
CAF / RAAF

A-10
USAF

F-111
RAAF

AMX
ItAF

EA-6B
USMC
5th GENERATION - CHALLENGES

- **Mindset**
  - Platforms Vs Capabilities

- **Planners & Pilots**
  - Omni role Capabilities
  - Renovated Tecniques Tactics Procedures (TTP’s)

- **Integration 4th & 5th Generation**
  - Mass required
  - Data hungry

- **Security issues**
  - Few Live training opportunities
  - Need to know Vs need to share
4th & 5th GEN. INTEGRATION

➢ Interoperability Vs INTEGRATION

➢ Integration in Air Domain // Joint Domain
  • How to see Air Ops & Joint Ops
  • How to operate Omni role, multi sensor, main node of net-centric battlespace
  • How to enable “legacy capabilities” into new battlespace environment
  • Material & non-material solutions (Connectivity Standards, Concept of Operations, TTP’s)
Example: Traditional ISR Scenario

Traditional ISR Assets

E-3 Sentry (AWACS)

Mission
- Detect, Identify and Track Airborne Enemy Forces
- Provide Accurate, Real-Time Picture of the Battle Space
- Command and Control

Radar range: >250 mi

RC-135 Rivet Joint

Mission
- Near Real Time On-Scene Intelligence Collection, Analysis and Dissemination Capabilities
- Detect, Identify and Geolocate Signals Throughout the EM Spectrum

Sensor LOS Limit: ~ 240 Nmi

E-8C JSTARS

Mission
- Ground Surveillance To Support Attack Operations
- Ground Moving Target Indication (GMTI)

Sensor Range: >135 Nmi, 120 deg FOV

Traditional ISR Assets are Forced away From Theater
Example: 5th Generation ISR Scenario

F-35 ISR Capability

- Digital Receiver Systems and Integrated Architecture Detect, Identify and Locate Threat Systems
- EOTS and DAS Provide High Resolution and Full Spherical Infrared Imaging
- AESA Radar Generates High Resolution SAR Maps and Ground Moving Target Indication
- Low Signature and Passive Sensors Reduce Emission Energy
- Advanced Sensor Fusion Aggregates Information to Create a More Complete Picture Than Individual Sensors Can Supply
- Advanced Communication Systems and Data Links Assure Connectivity

Multiple Spectrums and Techniques Fused Into... A Single Tactical Display
ADVANCED TRAINING IMPLICATIONS

- Complex activities

- Requires increased Trainee’s exposure to:
  - OMNI role mindset
  - Situational Awareness & Decision Making buildup
  - Complex Scenarios handling
  - Command & Control (C2)
  - Doctrine - TTPs

- Exploiting «Synthetic Training», a must!
  - Balance LIVE - Virtual

- New expertise required / New support personnel requirements
FORCE INTEGRATION TRAINING (FIT)

METHODOLOGY baseline

FROM END USERS NEEDS...

...TO TRAINING UNITS

DOWNLOAD

PHASE 3  LIFT  OCU  OPS UNIT

MAXIMIZE TRAINING COHERENCE

METL: Minimum Essential Task List

GBTS: Ground Based Training System
FORCE INTEGRATION TRAINING (FIT)

TACTICAL baseline

- LIVE Vs VIRTUAL – Balance/percentage

- LIVE
  - Airspaces
  - Venues (Security Vs Costs - effectiveness):
    - Ranges
    - Companion Trainer
    - Integration Exercise
    - Red Air
    - Tactical Leadership Programme
    - Red Flag

- VIRTUAL
  - Simulators Connectivity
  - Emulators
  - GREEN Ranges (Electronic Warfare, etc.)

- New qualifications/requirements/currencies
FORCE INTEGRATION TRAINING (FIT)

JOINT / COMBINED baseline

- Leverage on the Information Superiority

- **Strategic:**
  - Ability To Provide ISR for Joint and Coalition Forces
  - Decision Making Process enhancement

- **Operational:**
  - Providing targeting information to Land/Navy/Air Commanders (Kinetic + Non Kinetic)
  - Ability To Use / Provide Information to the Network

- **Tactical (Surface Units/Operators/SOF)**
TAKE AWAYS

- A paradigm’s shift
- Awareness of most challenges
- Few possible solutions explored
- Need to identify cost-effective COA’s
- Operational effectiveness requires a constant coherence effort of all stakeholders
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Q&A

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