

Panel 2: Emerging safety issues

EASA ICF/5: Hong Kong, 9-10 December 2015

Capt. Victor Liu, Assistant Director-General of Civil Aviation, Hong Kong Civil Aviation Department

Mr Patrick Ky, Executive Director, EASA

Mr ONG Chin Beng, Senior Assistant Director, Security Policy, Ministry of Transport, Singapore

Mr Gad Regev, Chief Operating Officer, CAA Israel

Your safety is our mission.



EASA
European Aviation Safety Agency



Moderator



Panellist

Panel 2

Victor Liu

Patrick Ky

**ONG
Chin Beng**

**Gad
Regev**

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Emerging Safety Issues & Aviation Risks

5th International Cooperation Forum ICF/5
9-10 December 2015, Hong Kong

Patrick Ky, Executive Director EASA

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TE.GEN.00409-001



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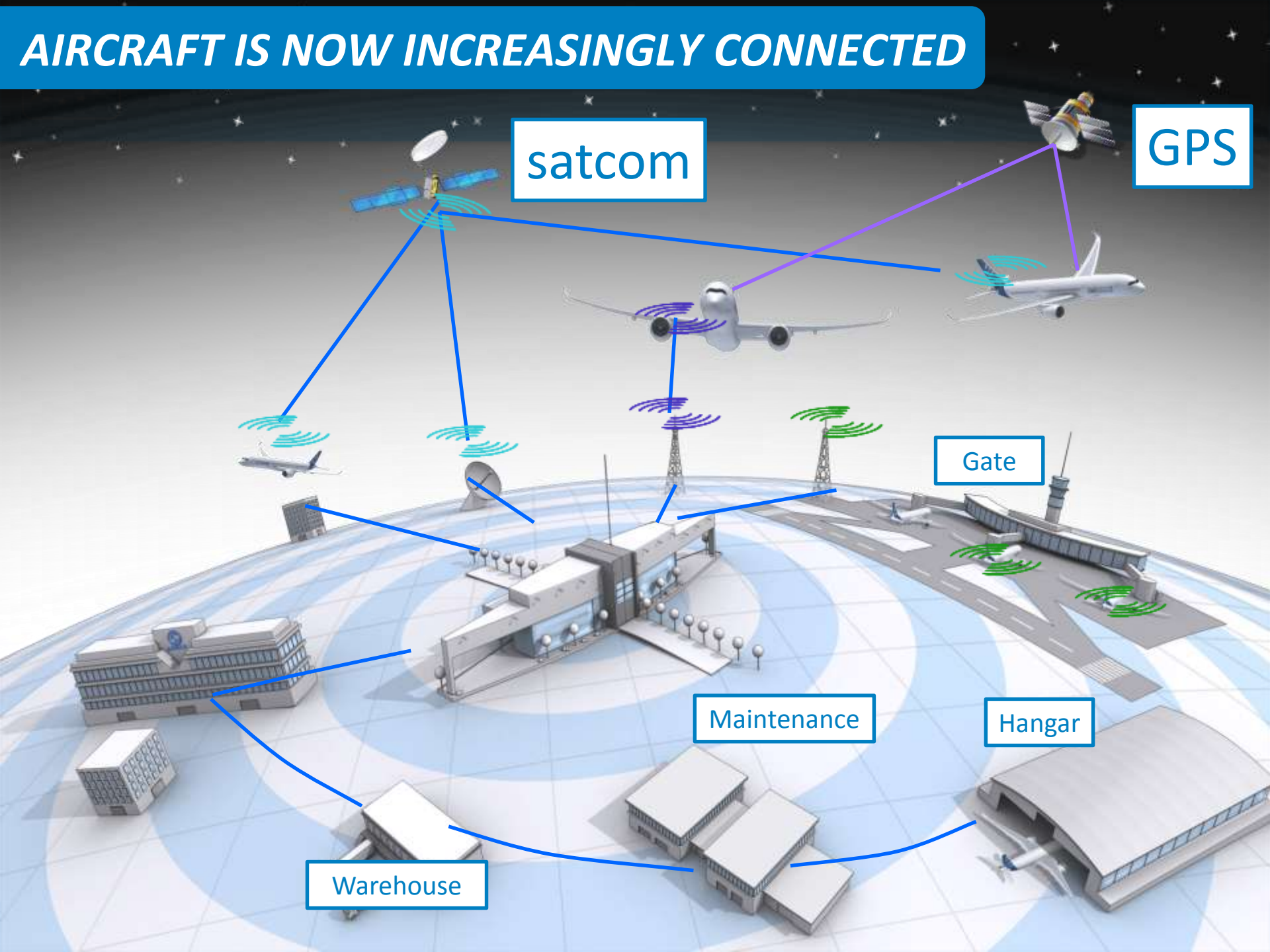
Cybersecurity Risks

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AIRCRAFT IS NOW INCREASINGLY CONNECTED





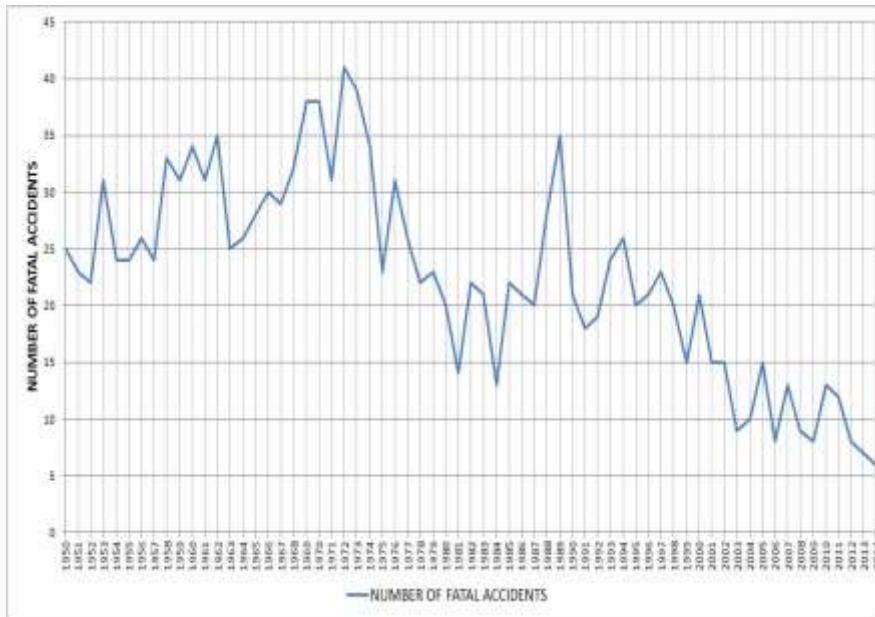
Change of paradigm

Safety Culture

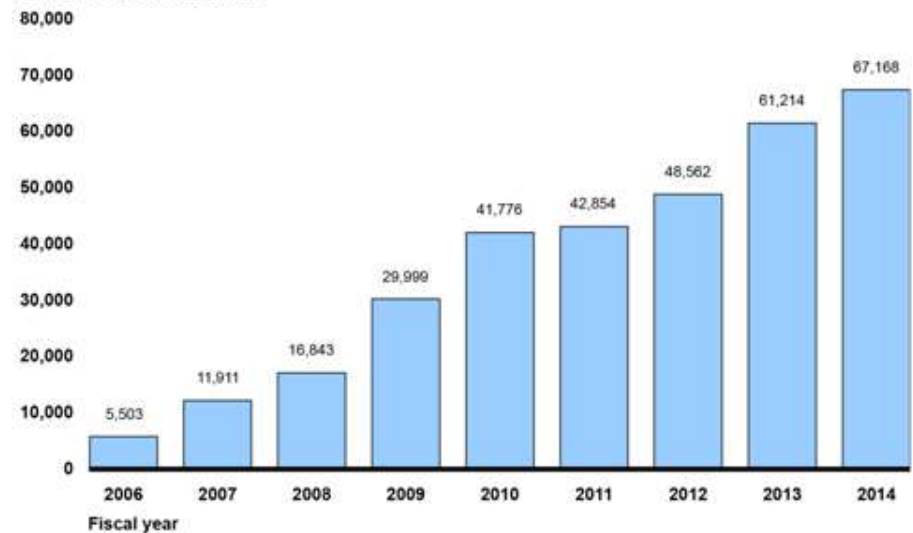
- Predictable
- Failure rate, human factors
- Events can be corrected
- Open and transparent culture

Security Culture

- Completely erratic
- Random
- Events are difficult to detect
- Confidential culture



Number of reported incidents



Source: GAO analysis of United States Computer Emergency Readiness Team data for fiscal years 2006-2014. | GAO-15-290



Aviation Cyber security Roadmap

Objectives

Situational awareness

- Identification of threats and associated risk
- Know what to protect first

Readiness

- Get the aviation system and its systems robust to attacks
- Share information
- Contingency Plans

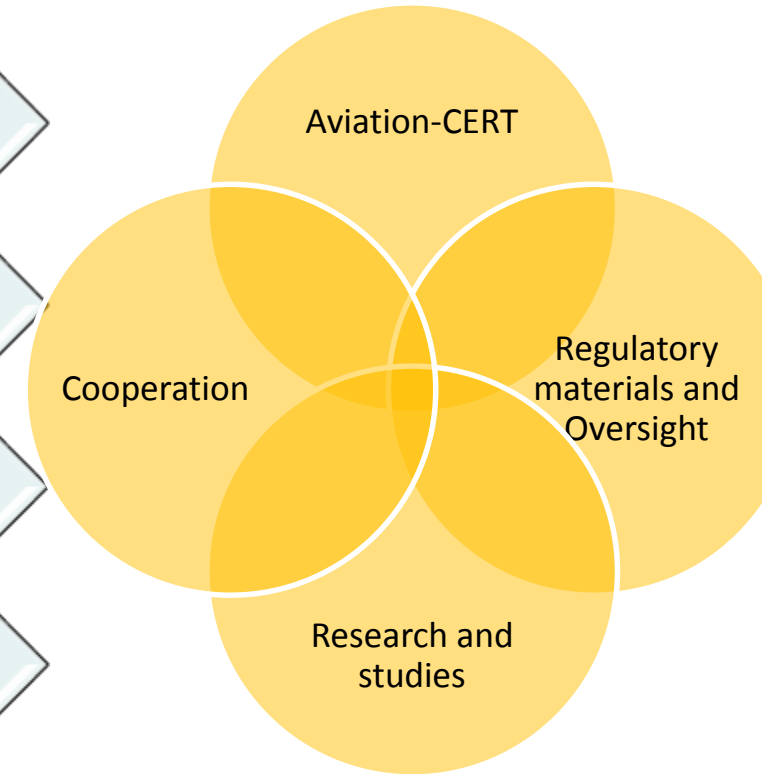
Reactive capability

- Communication
- Management of incidents
- Wide scale crisis management
- Recovery

Cybersecurity Promotion

- Lessons learned
- Sharing of experience
- Conferences
- Training

Enablers





Conclusion

➤ Collaboration is paramount

Risk assessment

Organizing the defense

global incidents and crisis





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Unmanned Aircraft -RPAS

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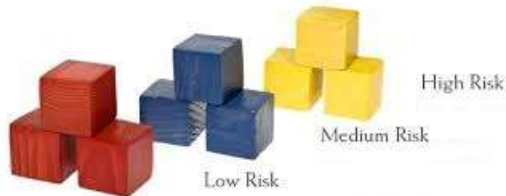
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Pillars of proposed approach



Operation centric



Risk based

- 3 categories: open, specific, certified



Commercial/Non commercial
Whole weight range



Categories of Operation



OPEN:

Low risk

No involvement of
Aviation Authority

Limitations : Visual line
of sight, Maximum
Altitude, distance from
airport and sensitive
zones



SPECIFIC

Increased risk

Operations
Authorisation with
operations manual

Specific qualification of
drone, personnel,
equipment based on
safety assessment



CERTIFIED

Regulatory regime
similar to manned
aviation

EASA and Authority
Certificates



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Outcome of Civil Aviation Cyber Security Conference

EASA International Cooperation Forum
Hong Kong
9 -10 December 2015

CONFIDENTIAL

Civil Aviation Cyber Security Conference



- Promote the collective awareness of cyber threats
- Organised by Singapore and supported by ICAO and IATA
- Brought together civil aviation professionals from across different parts of the civil aviation eco-system
- Twenty-four international and local speakers
- Attended by over two-hundred aviation stakeholders and security experts from more than sixteen countries

The threat and what we are dealing with



U.S. Panel Aims to Shield Planes From Cyberattack

FAA advisory committee was scheduled to meet this month amid rising concern over vulnerability to computer hackers.

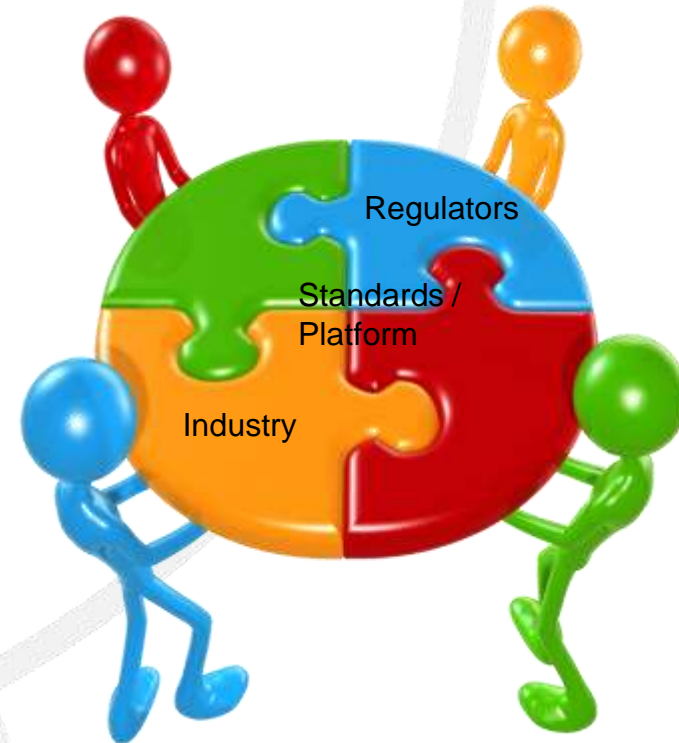
Views from the airlines



Cyber awareness,
culture,
responses



Cyber training,



Views from airport operators

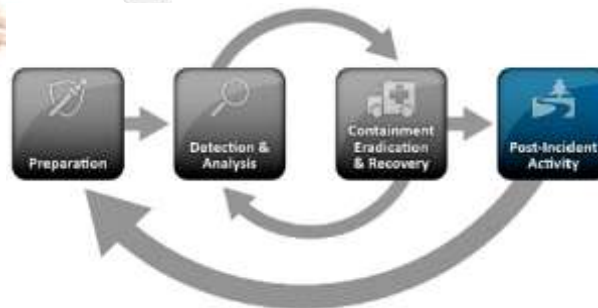


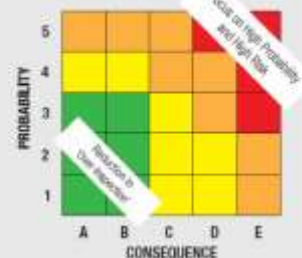
Image: NIST



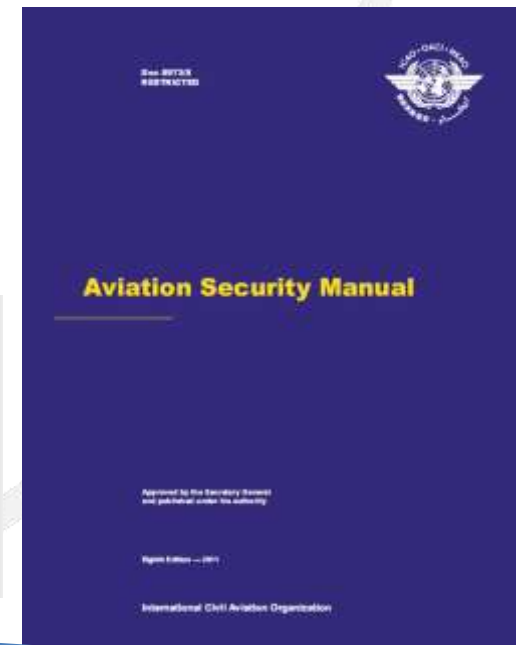
Other stakeholders' perspectives



Risk Assessment



Guidelines



The regulators' perspectives



**Critical
Information
Infrastructures**
Resilience and
Protection



Flexibility



Collaboration

Conclusion

- The threat is real and there are no barriers in cyber space
- States and industry stakeholders need to be made aware of the threat to aviation ecosystem.
- Coordination, collaboration, cooperation, and consistency of measures between States and industry stakeholders are required.



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Civil RPAS in Israel

EASA International Cooperation Forum Hong Kong
9 -10 December 2015



Overview

- Israel Aviation Activity overview
- Israel RPAS
- Airspace integration
- RPAS airworthiness
- Remote pilots
- RPAS operations - AOC/ROC
- Way forward

Israel Aviation Parameters - 2015



International Flights	130K (+ ~ 20K over flights) 15.5 Million PAX
Domestic Flights	20K 1.44 Million PAX
Tons of Cargo	300K
No. of Employees	20K
No. of Aircraft (Air carriers)	55
No. of ATCOs	200
International Airports	1 + 3

Israel Air Force RPAS History

MOD

MOD + CAAI

Searcher



Heron

Heron TP



Hermes 450

Hermes 900



Skylark



1970

1980

1990

2000

2010

2014

Israel RPAS Manufactures



Aeronautics



~ 4000
Experimental
Flight hours –
2014

Categorization Scheme



Micro 300g-1.5kg



Mini 1.5kg – 30kg



Light 30kg – 150kg



Heavy - Above 150kg

Israel RPAS Manufactures

- 12 Active RPAS Design and manufacture companies.
- ~90 Types and models, ~160 experimental airworthiness certificates 2014
- Most of the RPAS are developed for military use.
- Most the RPAS are developed for export.
- 3 RTC request for MALE systems

Requirements for RPAS operations:

- Registration
- Certificate of airworthiness (Experimental , Special for UAS)
- Remote Pilot licence



Airspace integration



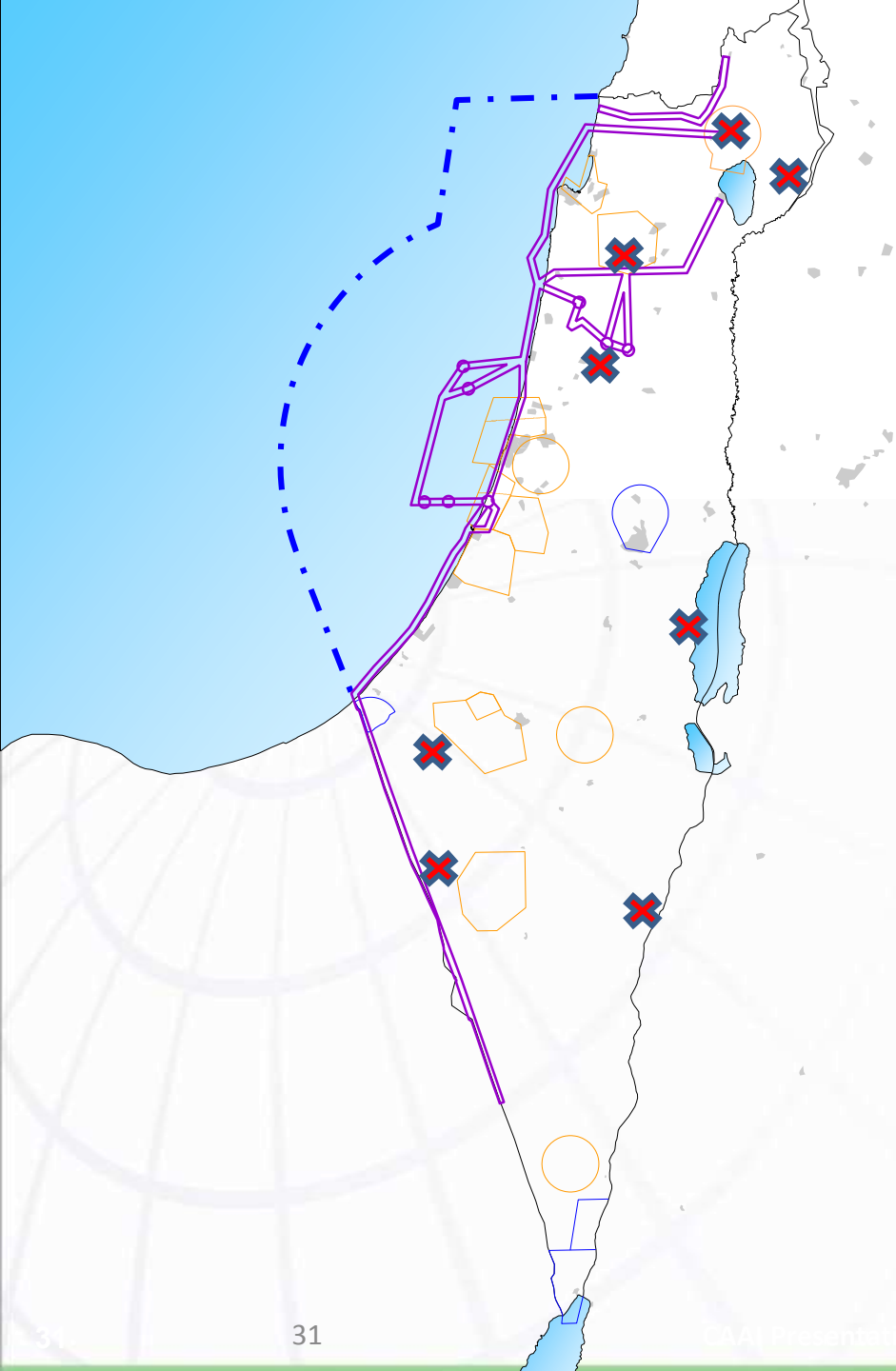
General Airspace Structure/Layout

- ISRAEL FIR
- Northern Sector Tel-Aviv Control + TMA
- Eastern ATS Route – J10
- Civilian & Military CTRs
- Restricted flight zone
- Low-altitude training line
- Military Air routes
- CVFR routes
- RPAs routes
- IAF Training areas
- Light aircraft training areas
- Helicopter training areas
- Fire Zone
- Bird Migration routes



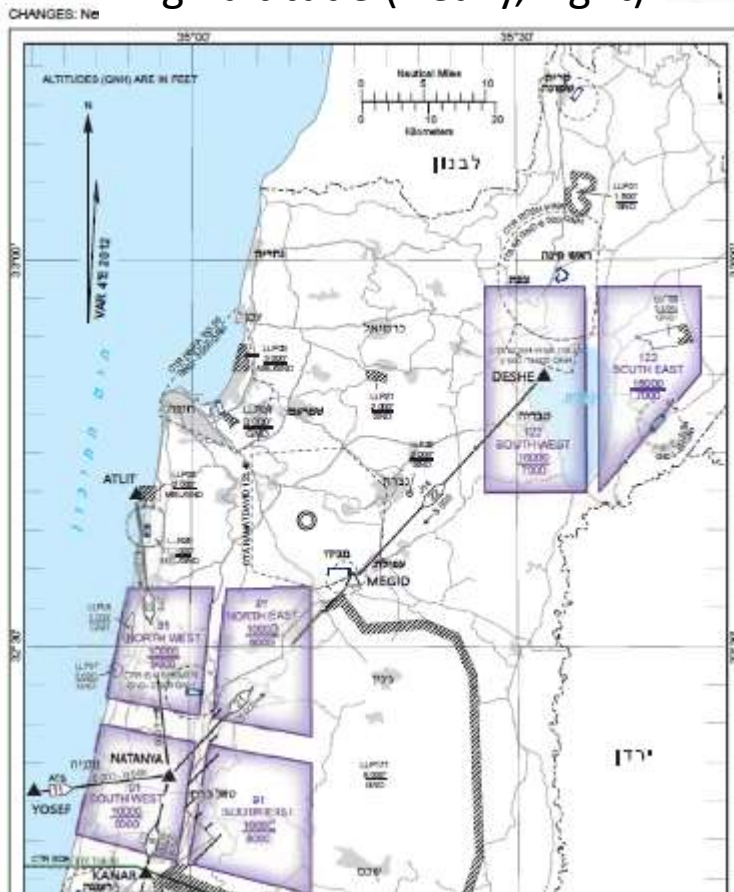
RPAS view

- ISRAEL FIR
- Civilian & Military CTRs
- RPAs routes
- Civil RPAS experimental activity (Aerodromes and Air strips)

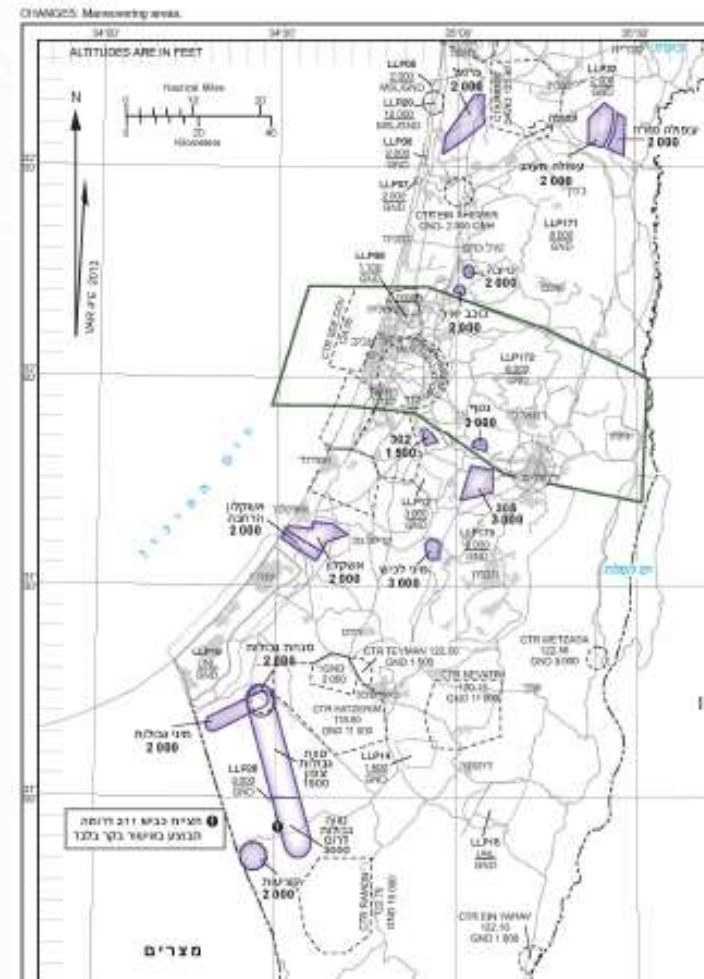


RPAS designated areas

High altitude (Heavy, Light)



Low altitude (Mini, Micro)



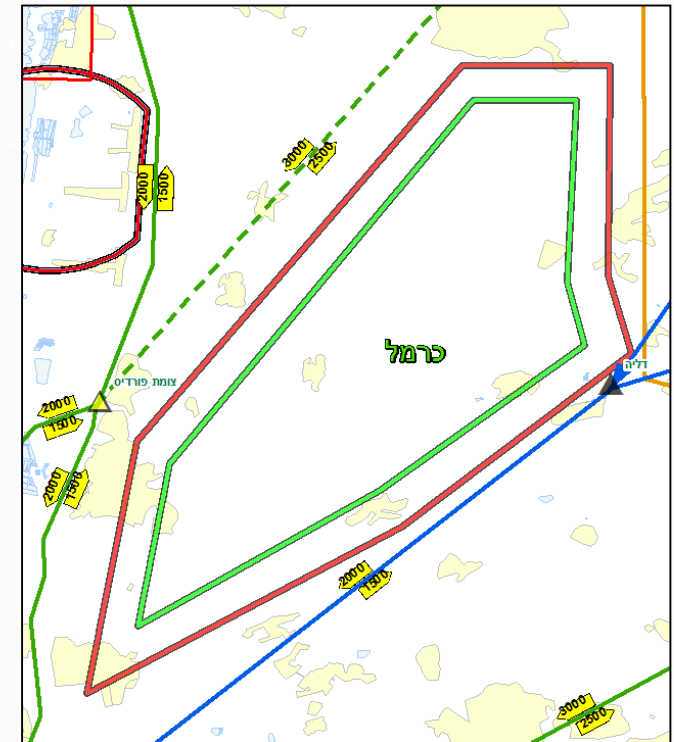
Airspace integration

- Most of Israel Airspace is delegated to the military.
- Operation of RPAS in civil Airspace requires special authorization by CAAI or allocation of segregated airspace.
- Aerodrome Operation – SCVFR, no simultaneous flight with manned aviation within the CTR
- Outside of aerodromes -IFR operation (Transponder is mandatory)



Airspace integration

- Mini RPA (up to 30 kg) :
 - Segregated airspace coordinated in advance
 - Training and experimental zones - published in the domestic AIP
 - Safety margins
 - BVLOS – Beyond Visual Line Of Sight



Airspace integration

- VLL (Very low level)- flight rules
 - Mini, Micro
 - Up to 300 ft AGL.
 - Maximum distance from RPS (Remote pilot station) - 500 m
 - VLOS (Visual line of sight).
 - Outside of CTRs, prohibited, restricted and danger areas – no requirement for coordination.
 - Inside... - needs establishing segregated area



Airworthiness Certificates

- Certificates:
 - Special airworthiness certificate - Experimental
 - Special Continues flight permit certificate – for RPAS (Israeli regulation)
- Certification process:
 - For experimental certificate – Safety analysis and list of needed documents for approval.
 - Compliance with special directives for RPAS
 - Safety Criteria for risk to people on the ground – 1/100,000 [fatalities/flight hour]



RPAS Flight Crew Licensing (FCL)

License and Ratings



New criteria for RPAS

Existing criteria

License/Permit
(as interim
measure)

Remote Pilot

VLOS Remote
Pilot

Instructor

Rating

Internal Pilot

external pilot

Category

Airplane

Helicopter

Multirotor

Others

Class

Weight

Single/Multi
engine

piston / Turbo
prop + Jet

Land / Sea

Type

Heron

Hermes 450

...

RPAS FCL

General Requirements

- Knowledge:
 - Air Navigation Law and ANRs*
 - Aircraft General Knowledge, Flight Performance, Planning and loading, Principals of flight*
 - Meteorology*
 - Navigation
 - Radiotelephony
 - Human Factors
- Medical requirement – Class III
- Practical skill test*

Commercial pilot
knowledge requirements

230 licensed Remote
Pilots

Applicable requirements to VLOS RP - items marked in *

Operations

- Air operator certification:
 - Operations Manual
 - Training Manual
 - Maintenance Manual
- Certification process:



15 licensed companies



International activity



Remotely Piloted Aircraft
Systems Panel

JARUS

JARUS Work Group 1 –
RPL & OPS leader

JARUS members



Way forward

- Regulation update according to international rules (ICAO RPAS manual) development and harmonization.
- Safety Issues:
 - Surveillance – manufacturing @ operations
 - Enforcement
 - Market flood of small RPAS