NBAA IOC Oceanic Operations

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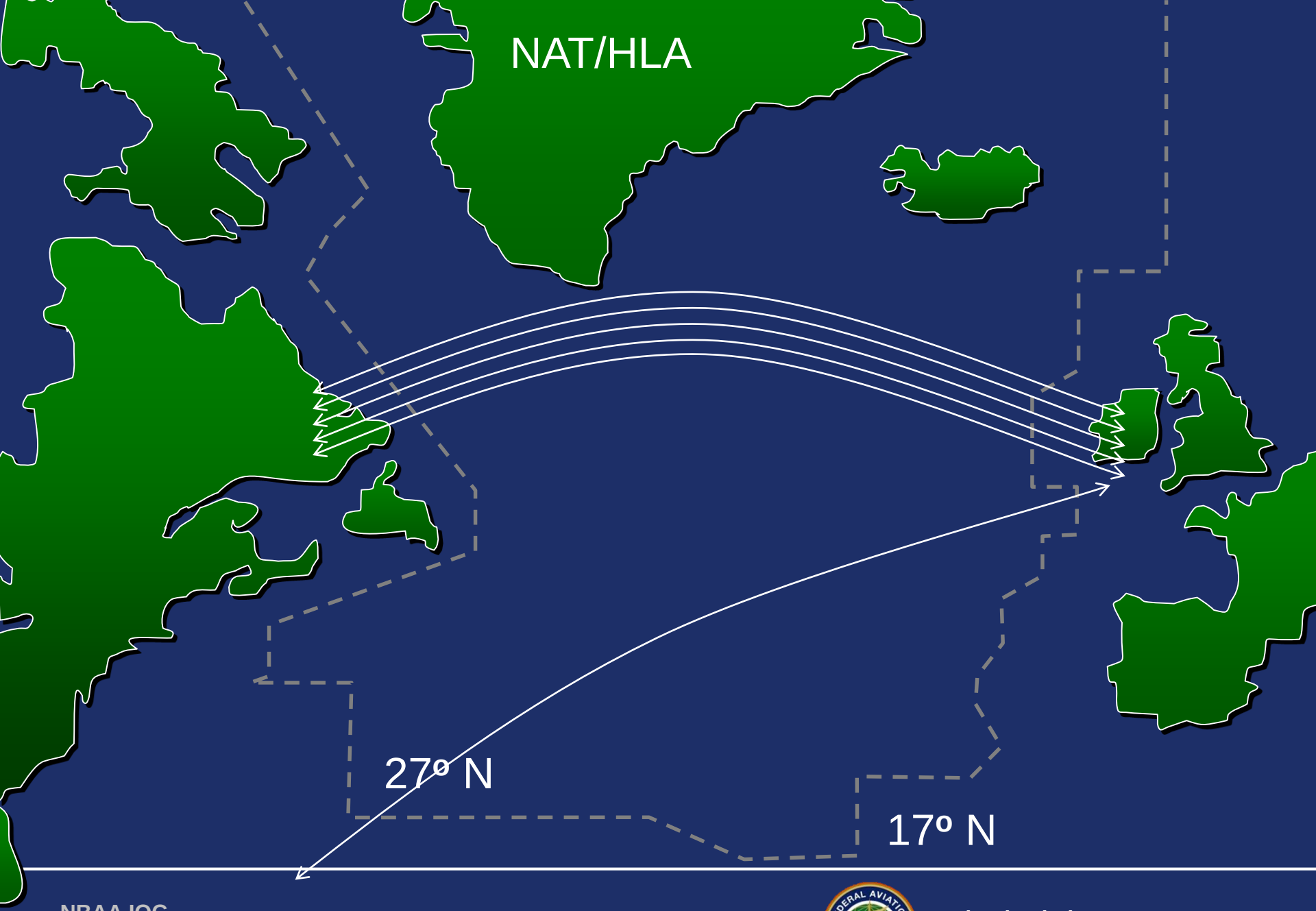
Federal Aviation Administration

So This Is Why They Paint A Centerline…


NAT/HLA
27º N
17º N

Question 1

Approximately how many times a year does your company conduct a NAT crossing?

A. 1-5

B. 6-10

C. 11-15

D. More than 15

Is this really RVSM?

Nope, this is.

NAT Reported Events

01 Jan 2007 – 31 Dec 2015

Event Type	Frequency
Vertical LHD	1186
Intervention	737
Time-related	320
Lateral Deviation <25Nm	483
Longitudinal Separation Erosion	277
Lateral GNE (=>25NM)	96

- 2015 – 178 Turnbacks and Diversions
- 350 reported events in the above categories within or above MNPSA
  - Commercial – 312 events - 89%
  - IGA – 33 events - 9%
  - MIL – 5 events – 1.5 %

Gross Navigation Errors (GNE)

GNE defined as 25 nm or more from **CLEARED ROUTE**

- Lateral deviations of 10 nm or more are noted

- Reclearance – **#1 scenario** leading to a GNE
  - Updated LRNS, CFP, Plotting Chart
  - Independent source to cross check magnetic course and distance in FMS (e.g. 10 degree longitude tables)

- Failure of crews to adhere to published procedures by not conducting proper crosschecks of clearances with information in LRNS
  - Flying the flight plan instead of the **CLEARANCE**

GNE's Common Causes Con't

- Failure of crews to manually check accuracy of waypoints in FMS by referencing page for expanded coordinates
- Special contingency routes 60 N 10 W vs 61 N 10 W
- Crew is cleared via NAT track but filed **coast in** point is missing from the CFP

Large Height Deviations (LHD)

Defined as 300 feet or more from assigned FL

- Analysis of reported LHD events in the NAT:
  - Approximately half are caused by Turbulence, Autopilot Malfunction or Nuisance TAs
  - The other half attributable to Crew/ATC Actions
  - **#1 scenario** leading to an LHD is a conditional clearance (e.g. use of words **AT** or **BY**)

- The NAT currently exceeds the Target Level of Safety (TLS) threshold in the vertical dimension
  - Operational errors are the primary contributor

Height Deviations Major Operational Causes

- Failure of crews to climb or descend because of a misinterpretation of clearance
- Crews fail to change flight level before or at specified longitude
- Poor R/T phraseology
- Entry at oceanic boundary at flight planned rather than cleared flight level

Erosion of Longitudinal Separation

- Longitudinal separation
  - NAT Procedures are minimum of 10 min. in-trail based on assigned mach
  - ETAs Updated (for voice reporting aircraft)
  - Master Time Source (i.e. FMS)
- All NAT providers use automatic ground ATC systems that depend on accurate reports of progress
  - Therefore timely reports are critical

Recommendations Pre-Departure

- Use/develop Oceanic Checklist
- Confirm accuracy of CFP coordinates against master source & compare routing to International Flight Plan
- Master time source
- Data base-currency, version
- Ensure present position coordinates are correct

Recommendations Pre-Departure Cont.

- Independent verification – screen to document
- Distance/course check & tolerance
- WX documents-METARs, TAFs, SIG WX, SIGMETs
- Special Use airspace requirements-Nav/Comm, NAT/HLA, RVSM, RNP
  - **ICAO Focus on specific C/N/S requirements**
  - Requirement to **verify RNP value** in FMS based on most stringent RNP filed on the flight plan

Recommendations Coast Out

- Navigation accuracy check before leaving ground-based nav aids
- HF check or Sat Comm
  - **Confusion over the use of SATCOM voice vs HF radio**
- Use caution when crossing more than one oceanic FIR (i.e. Brest and Madrid FIRs)

Recommendations Cruise

- Oceanic clearance-mach number/flight level/route – ***Shanwick***
- Required Comm/Nav/Sur equipment
- Gross error check-radar fix from ATC
- Strategic Lateral Offset Procedure (SLOP) – SOP
  - Centerline, 1NM Right or 2NM Right
  - **ICAO 4444 PANS ATM added offsets in tenths of NM not to exceed 0.5NM Right in reduced lateral separation**
- Transponder – As applicable

Question 2

SLOP should be used in the following area:

A. FLEX Tracks such as the NAT OTS
B. Published routes between U.S. West Coast and Hawaii
C. Random oceanic routes
D. All the above

Recommendations Cruise Cont.

- Ensure position cross checks consistently accomplished
- Tracking outbound on currently effective ATC clearance - Waypoints-prior, overhead, outbound
- Use of plotting chart - 10 min. plot
- ETA tolerance
  - **Update Required for voice reporting aircraft when ETA is in excess of 2 min.**

Contingencies

- Track offset procedure - **- 15 nm**
  - **Used for turnbacks or diverts**
  - **500 feet off assigned flight level**
  - **Mechanical – Minimized descent rate**
- Weather Deviation
  - **Confusion over 10NM corridor and the need to attempt contact with ATC if requiring a deviation less than 10NM**
  - **Climb or descend 300 feet at 10NM**
- COMMUNICATE

Oceanic Deviations

- Recommendations to avoid a deviation
  - 2 Crewmembers listen and record
  - Clarify clearance - LRNS, Master CFP, Plotting Chart
  - Coast In/Coast Out Point

Recommendations General

- Establish and follow SOPs
- Adherence to procedures such as detailed in NAT Ops & Airspace Manual would prevent the majority of GNEs
- Oceanic Errors Safety Bulletin (OESB)
- NAT Track Message
  - 80% of GNEs from Poor Cockpit Procedures
- Use of current data link guidance material
  - **GOLD**

International Flight Plan Codes

Item 10 / Field 10a Field 10b - Surv (D1)

A : GBAS Landing Sys	M1- M3 : ATC RTF (SATCOM, MTSAT, Iridium)
B : LPV (APV w/SBAS)	O : VOR
C : LORAN C	P1 - P9 : Reserved for RCP
D : DME	R : PBN Approved
E1 – E3 : ACARS	S : Standard equipment
F : ADF	T : TACAN
G : GNSS	U : UHF radio
H : HF Radio	V : VHF radio
I : INS	W : RVSM
J1 – J7 : CPDLC	X : MNPS
K : MLS	Y : VHF w/ 8.33 kHz spacing capability
L : ILS	Z : Other Equipment carried or other capabilities

Field 18 - Other Information (PBN)

Planned Reductions in Separation

- **Cross Polar**
  - RNP 10 and 50nm lateral separation
- **North Atlantic**
  - 5 min. longitudinal separation (CPDLC, MNPS, ADS-C)
    - Trial started in May 2010
  - Half degree lateral separation (CPDLC, RNP-4, ADS-C)
    - Trial began 15 Dec. 2015
    - Special Emphasis Items Bulletin – Check Magnetic Course, Distance and Expanded Coordinates
  - Datalink Mandate
    - CPDLC and ADS-C Required on all OTS Tracks FL 350 – FL 390

NAT Half Degree Lateral Separation

- Spring 2014 Numerous NAT Errors
- ARINC 424 Naming Convention
  - 5040N vs N5040
  - Some databases use letter H to indicate ½ deg. latitude
  - Datalink Use per Guidance in GOLD Document
- Some Operators Use Seven Alphanumeric Characters
  - Example N50W040
- Important to Emphasize Consistent use of Navigation Cross Checks
  - Reduced Lateral Separation Minimum (RLatSM) Bulletin – Special Emphasis Items

Europe Link 2000+ Data Link Mandate

- Delayed until 2020
- Link 2000+ terminology replaced by ATN B1

SAFA Ramp Checks

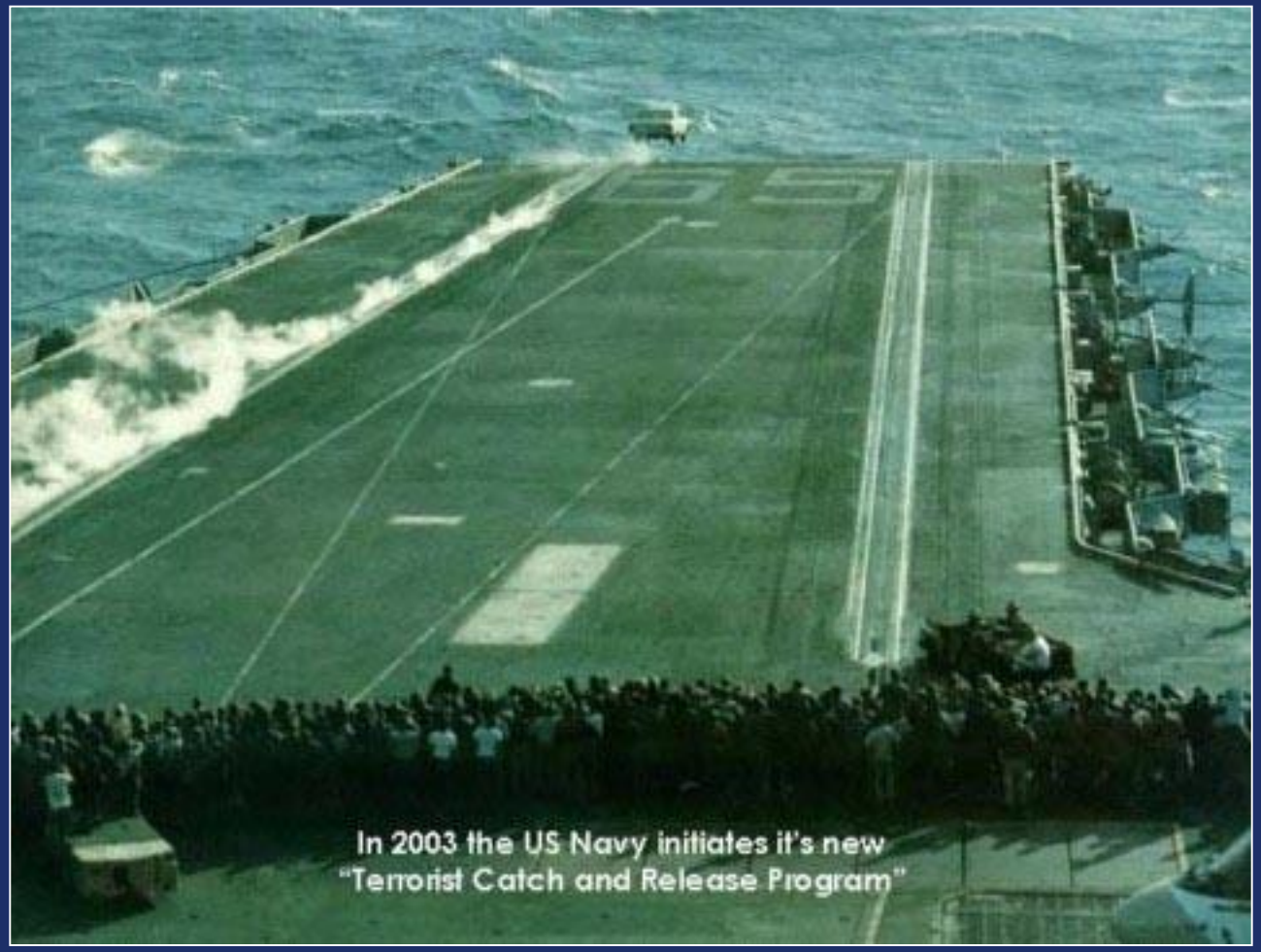
- Recommend SAFA “Binder”
- Focused items include:
  - Safety equipment
  - Annex 1 Personnel Licensing
  - Annex 6 Operation of Aircraft (applicable part)
  - SMS

Validations

- Special Areas of Operation (SAO) request may require:
  - Table Tops
  - Validation Flights
- Guidance in Order 8900.1
- POI will Consult Regional SAO Specialist

References

- NAT Doc 007 North Atlantic Operations and Airspace Manual, Edition 2016
- Oceanic Errors Safety Bulletin (OESB)
- Web Sites:
  - **ICAO**
    - EUR/NAT
  - **FAA**
    - NAT Resource Guide
    - Pacific Resource Guide
    - WATRS/GOMEX/Caribbean Resource Guide
  - **Europe**
    - Skybrary


In 2003 the US Navy initiates it's new
"Terrorist Catch and Release Program"