So This Is Why They Paint A Centerline…
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

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical LHD</td>
<td>1186</td>
</tr>
<tr>
<td>Intervention</td>
<td>737</td>
</tr>
<tr>
<td>Time-related</td>
<td>320</td>
</tr>
<tr>
<td>Lateral Deviation &lt;25Nm</td>
<td>483</td>
</tr>
<tr>
<td>Longitudinal Separation Erosion</td>
<td>277</td>
</tr>
<tr>
<td>Lateral GNE (=&gt;25NM)</td>
<td>96</td>
</tr>
</tbody>
</table>

- 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)**

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

**Field 18 - Other Information (PBN)**

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**NBAA IOC**  
23 March 2016
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

• 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 its new “Terrorist Catch and Release Program”