Welcome to

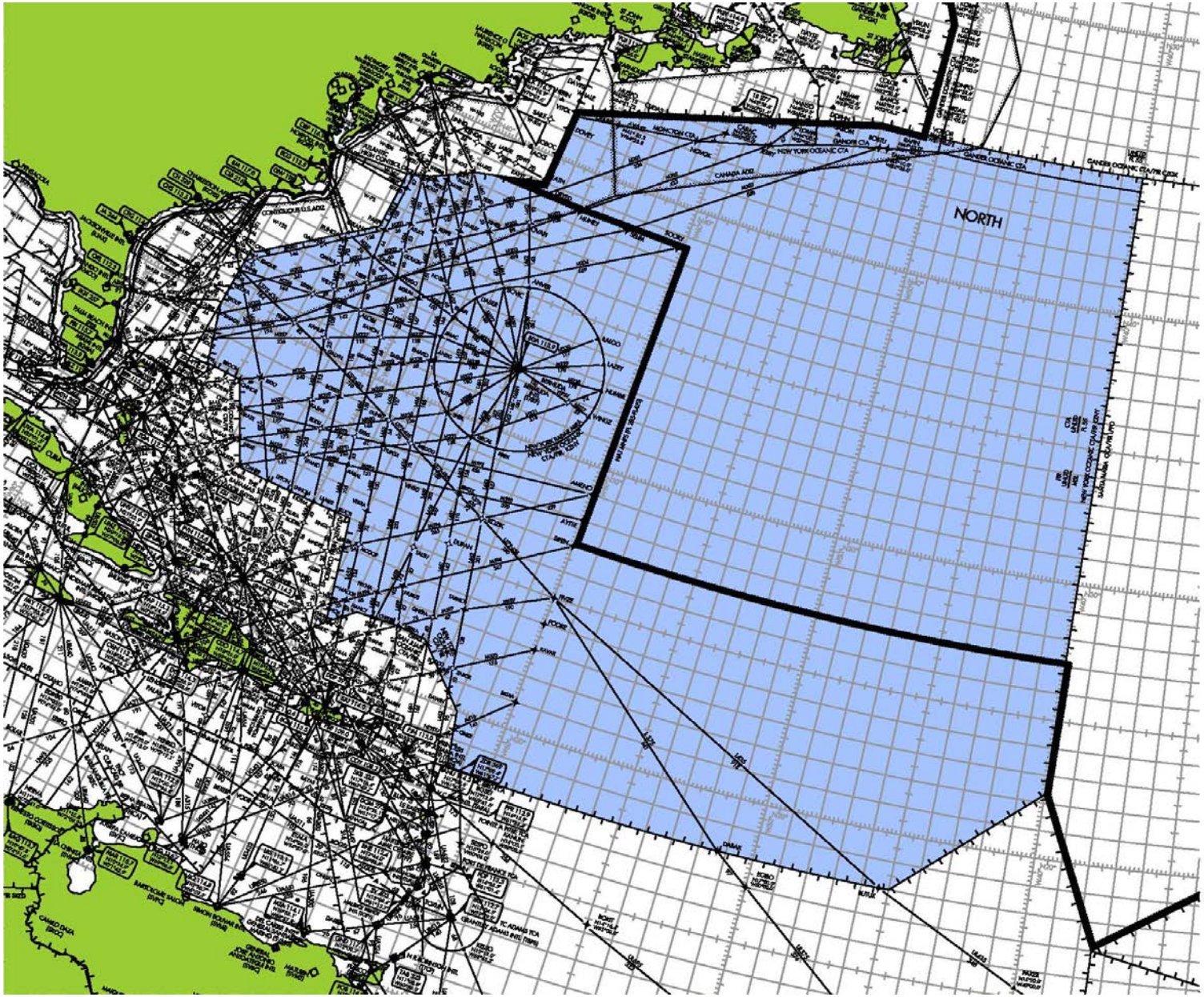
New York Air Route Traffic Control Center

Federal Aviation Administration

Operations in the New York Center CTA/FIR

Presented to: New York Center Oceanic Operations Work Group

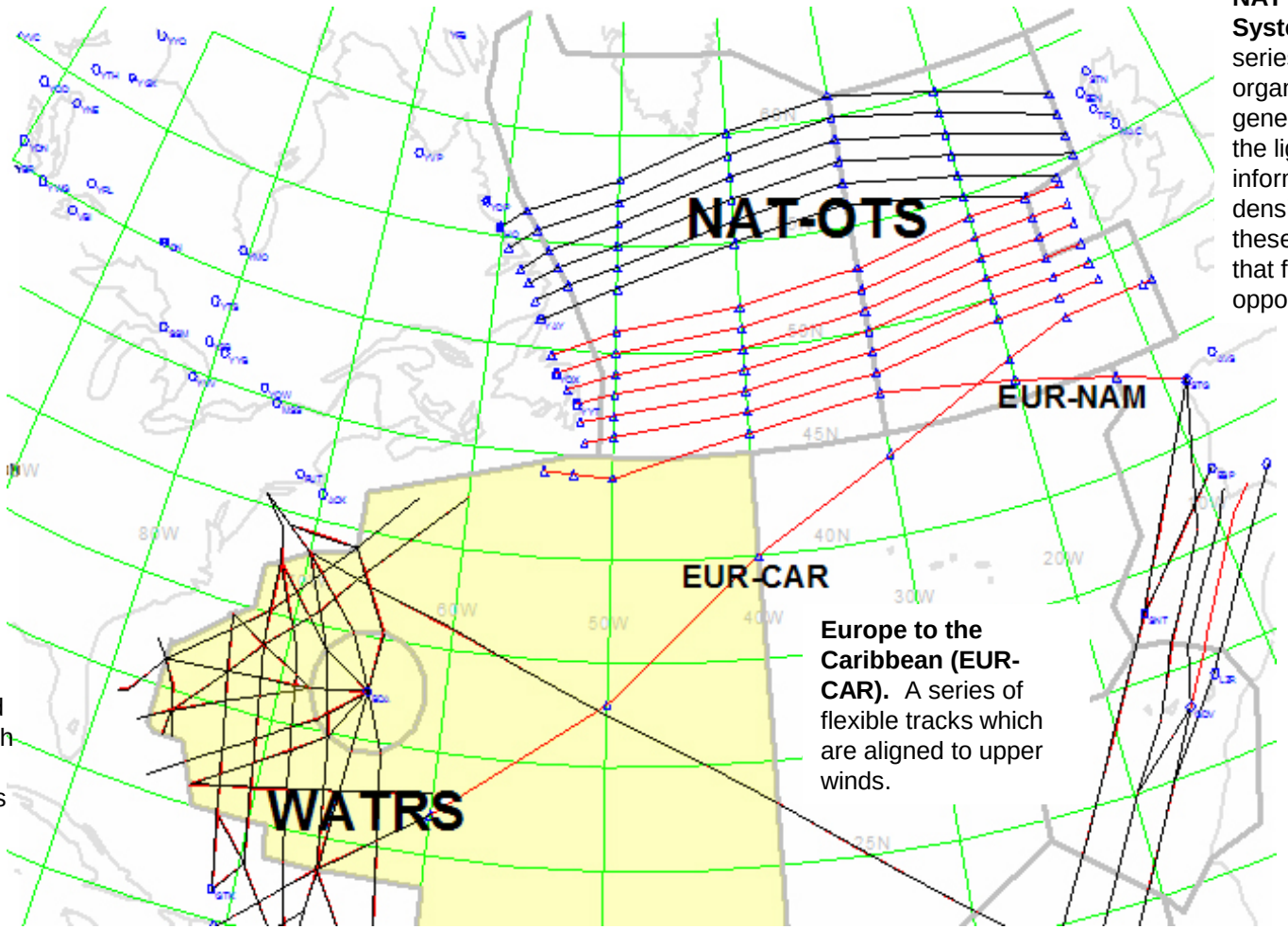
Date: February 11-12, 2015


NORTH


FIR
BOSTON
KZBW
FIR
NEW YORK
KZWY
FIR
CLEVELAND
KZOB
FIR
WASHINGTON
KZDC
FIR
JACKSONVILLE
KZJX
FIR
NEW YORK OCEANIC WEST
KZWY
FIR
NEW YORK OCEANIC EAST
KZWY
FIR
MIAMI OCEANIC
KZMA
FIR
SAN JUAN
TJZS
FIR
HABANA
MUFH
FIR
DOMINGO
1000 km
500 mi

Atlantic Operations

4 distinct traffic flows affect US Atlantic oceanic operations, controlled from New York Center:



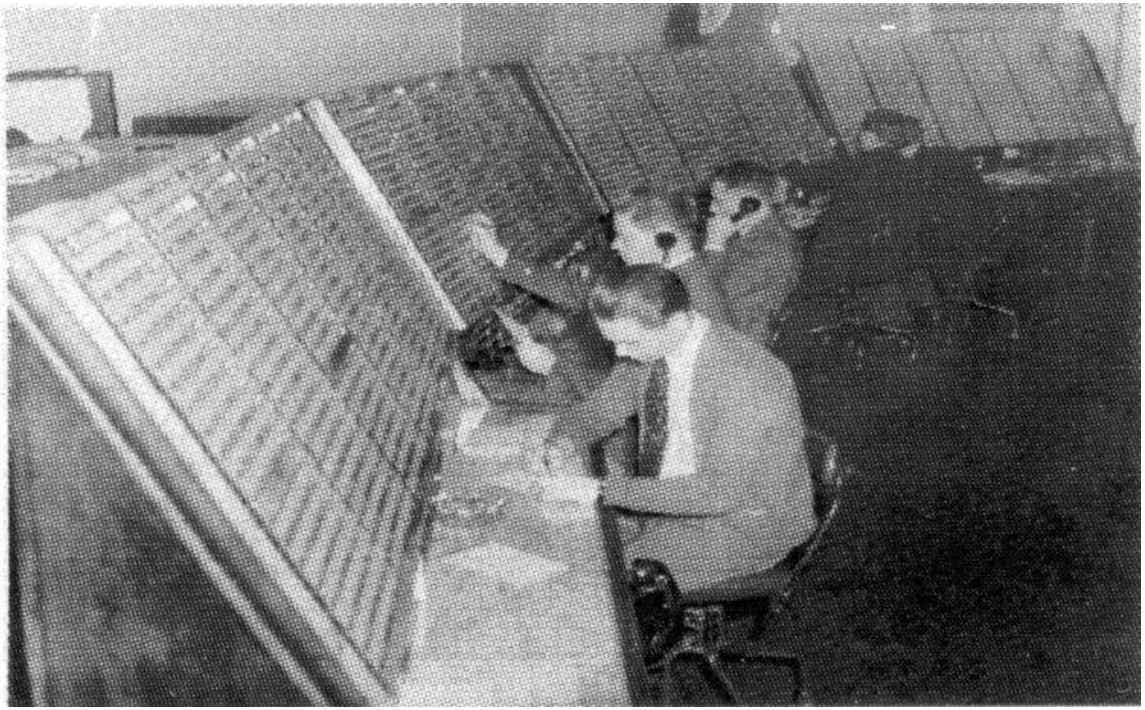
NAT Organized Track System (OTS). A series of highly organized tracks generated twice daily in the light of wind information. The density of traffic on these tracks is such that few crossing opportunities exist.

Europe to North America (EUR-NAM). Random tracks are used which can become more complex due to the random nature of the crossing tracks.

Europe to the Caribbean (EUR-CAR). A series of flexible tracks which are aligned to upper winds.

Western Atlantic Route System (WATRS). A fixed set of tracks of high complexity which experiences peaks of high traffic density.

New York Center-1940



New York Center-2000

New York Oceanic CTA/FIR Current Capabilities

Technology Enables Change: The FAA ATOP System

- **The FAA's ATOP system is one of the most advanced CNS/ATM systems in the world.**
- **Fully operational in New York, Oakland and Anchorage oceanic airspace. Operational at New York Since June 2005**

ATOP Functionality

ATOP Provides:

- Complete 4D Profile Protection in Oceanic Airspace
- Automated Conflict Detection for All Oceanic Separation Standards
- Monitoring and Control by Exception
- Separation Criteria Based on Individual Aircraft Performance and Equipage
- Full Integration of RADAR and non-RADAR Traffic
- Dual Channel Architecture with full redundancy on all processors
- Fully ICAO 2012 compliant system. Supports all ICAO flight plan messages such as FPL, CHG, DEP, CNL, ARR.

ATOP Functionality

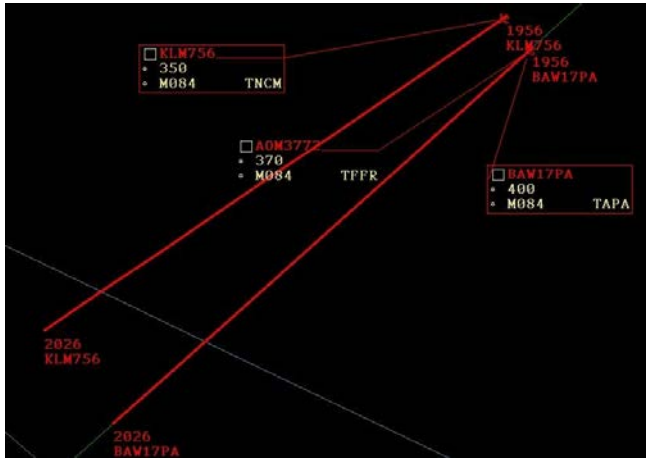
ATOP Provides:

- Dynamic Airspace Allocation
- Satellite based Controller Pilot Data Link Communication (CPDLC)
- Satellite based Automatic Dependent Surveillance – Contract (ADS-C)
- Automatic Dependent Surveillance-Broadcast (ADS-B)
- Paperless Environment
- Automatic Weather Dissemination
- Air Traffic Services Inter-facility Data Communications 2.0 (AIDC)
- RADAR Data Processing
- Elimination of voice communication between RADAR and non-RADAR Ocean21 Sectors

Conflict Prediction and Resolution

Conflict Probe

- Ocean21 Detects All Conflicts - Controller Resolves Conflicts
- Aircraft/Aircraft and Aircraft/Airspace
- Probe Runs Automatically on All Trajectory Updates
- Applies Appropriate Separation Standard
- Conflict Probe is 4-dimensional and calculated down to the second.



2nd PROF CONFLICTS FOR BAW17PA

Override Help

Intruder	Att	Active	Att	Ovrd	Type	StartTime	EndTime
*BAW17PA	D	AOM3772	-		>>	1956	2122
*BAW17PA	D	KLM756	-		>>	1956	2027

CONFLICT REPORT

same direction REQUIRED 10 minutes (50 nm) 1000 ft

7.7 degrees LOS NOW ACTUAL 0 min 03 sec (17 nm) 0 ft

		PASSING POINT			CONFLICT SEGM	
B744	F400↓				2438N	2201N
*BAW17PA	F340				05151W	05513W
M084					1956	2026
B744					2452N	2242N
KLM756	F350				05203W	05545W
M084					1956	2026

Draw Close

Conflict Resolution

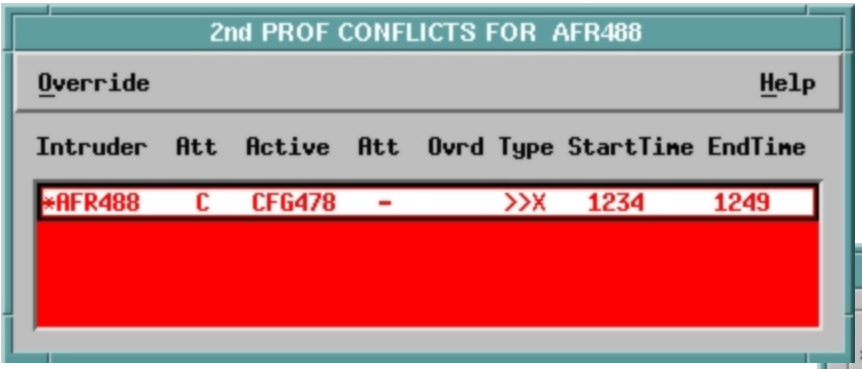
- Conflict Probe is 4-dimensional and calculated down to the second.
- As a result, almost all clearances are time based.
- Probed and accepted clearances are protected against other aircraft and airspace
- This provides us the capability to issue future altitude and route changes and “reserve” those altitudes and routes

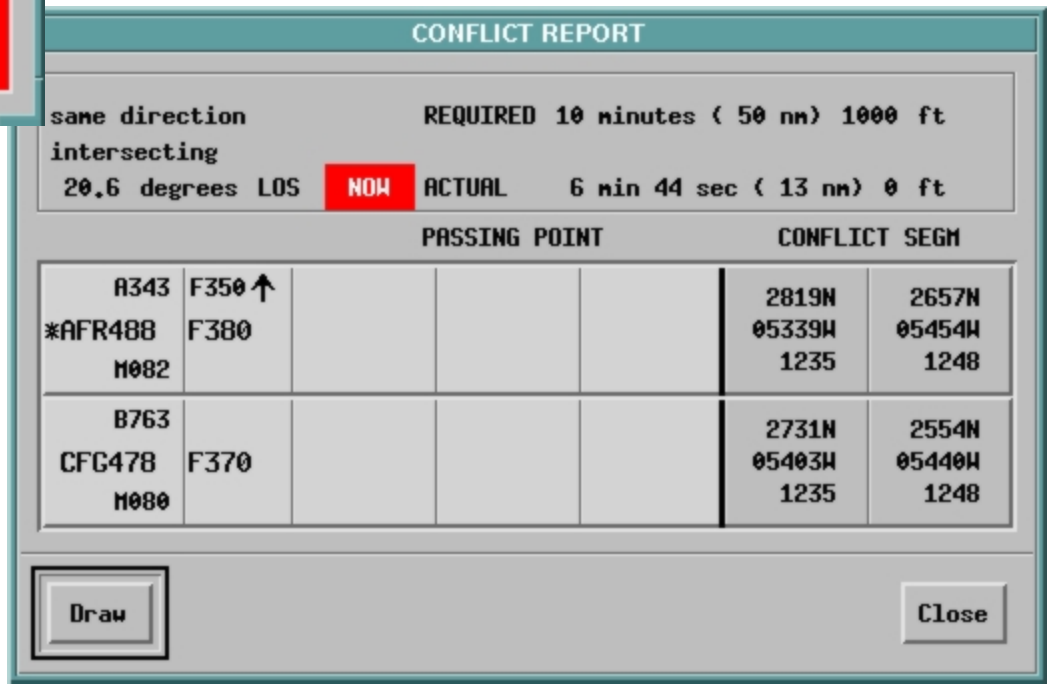
Straight Climb With Long Term Conflict

Not often issued

Straight Climb With Long Term Conflict

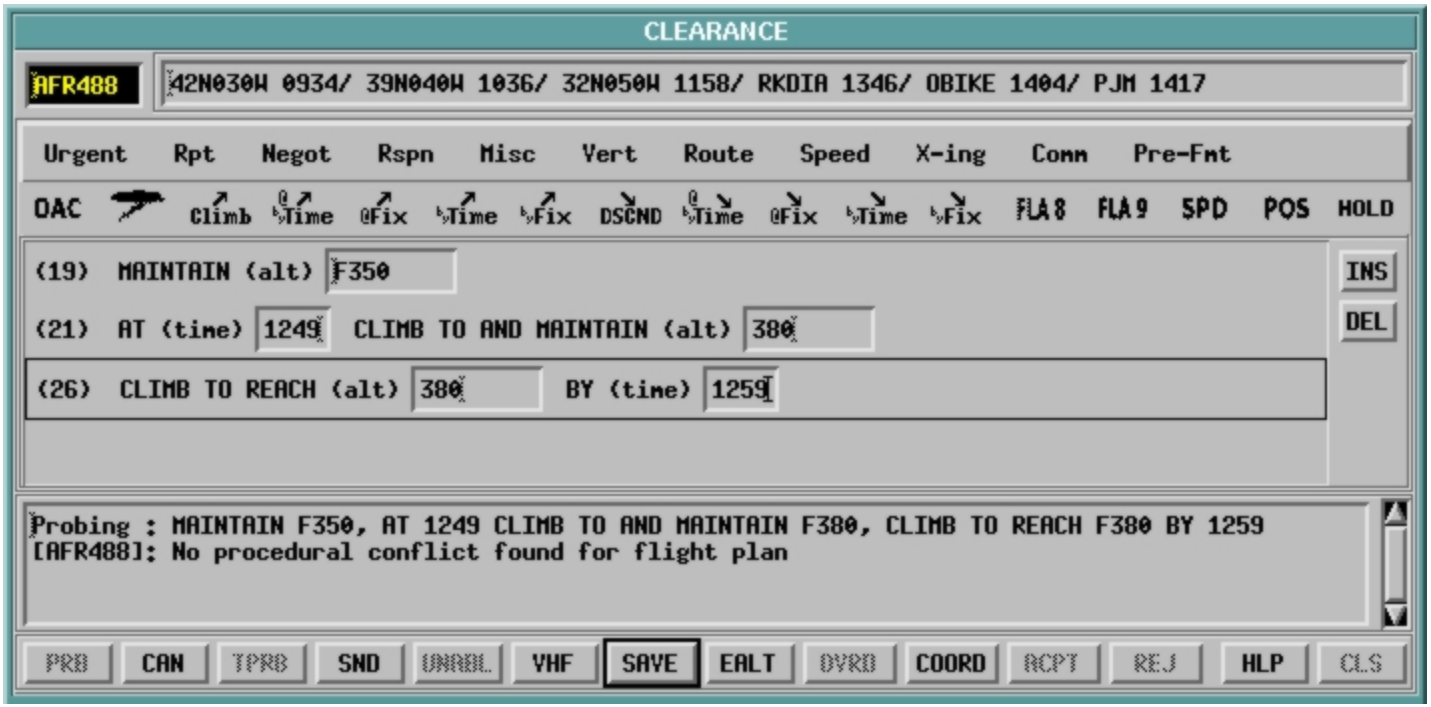
Straight Climb With Long Term Conflict





Conflict would exist until AFR488 reported level

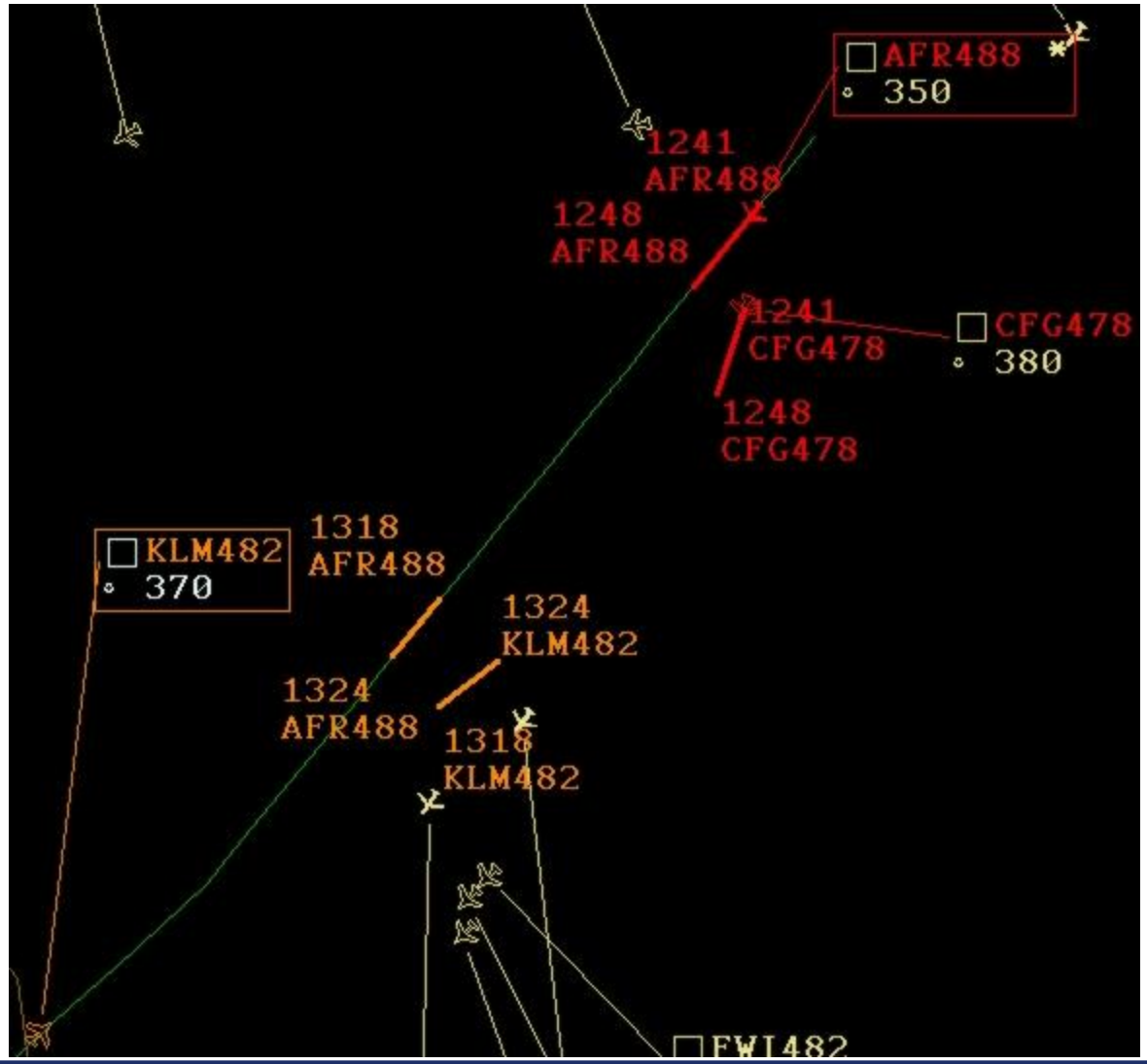
At Time By Time Climb



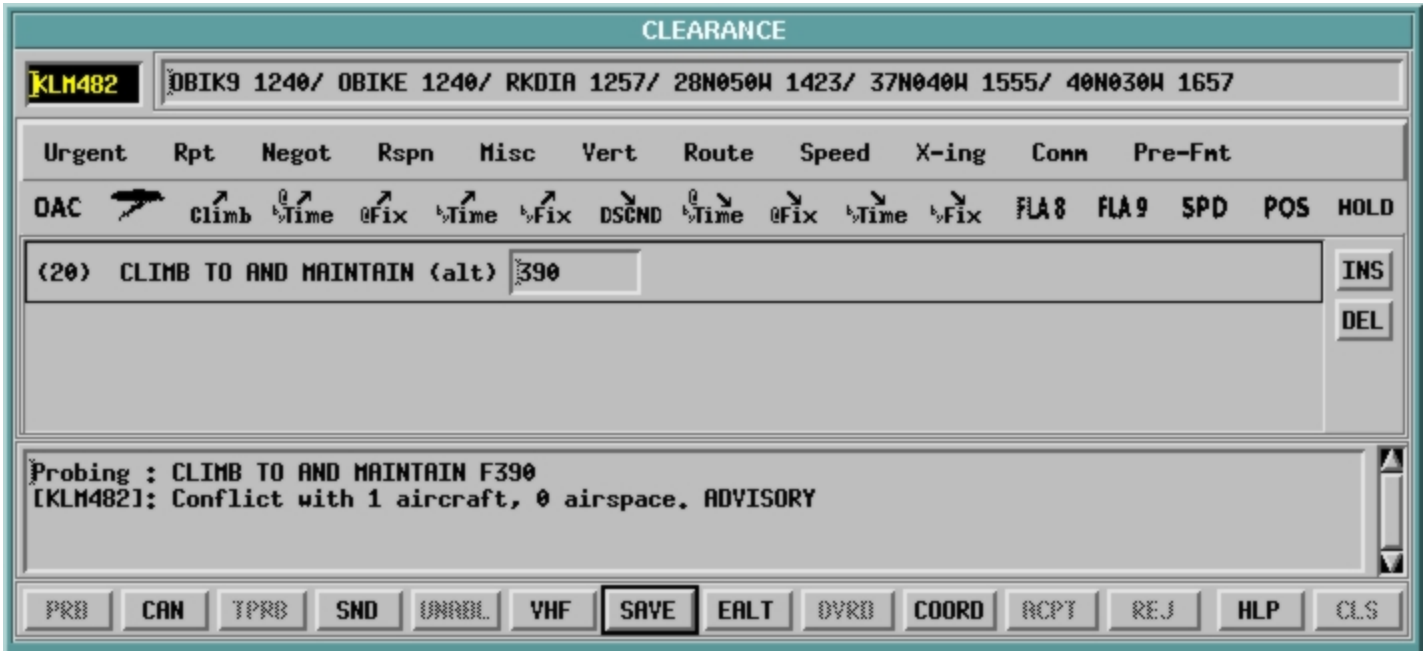
At Time By Time Climb

- By using time restrictions, we can provide climb clearances and reserve altitudes or routes that may otherwise become unavailable at a later time.

At Time By Time Climb

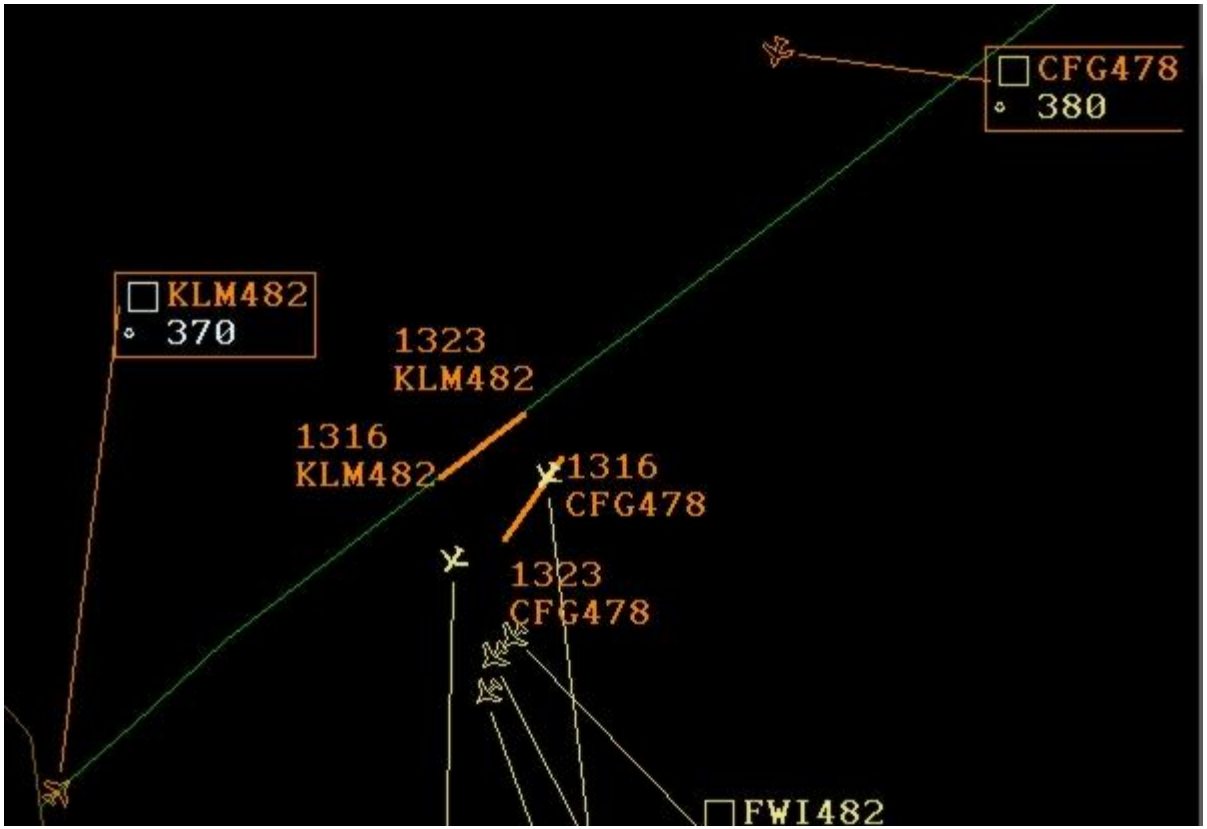


By Time Climb

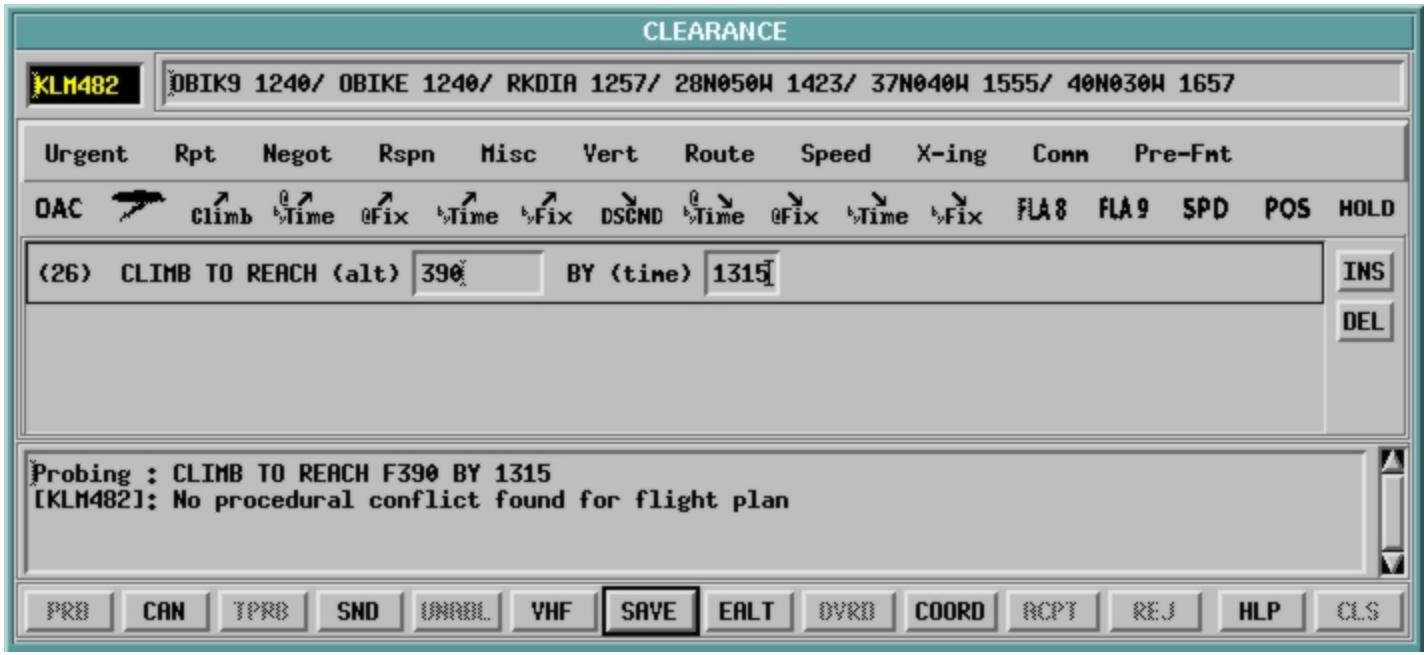


Straight climbs lead to “False” conflicts

By Time Climb



By Time Climb



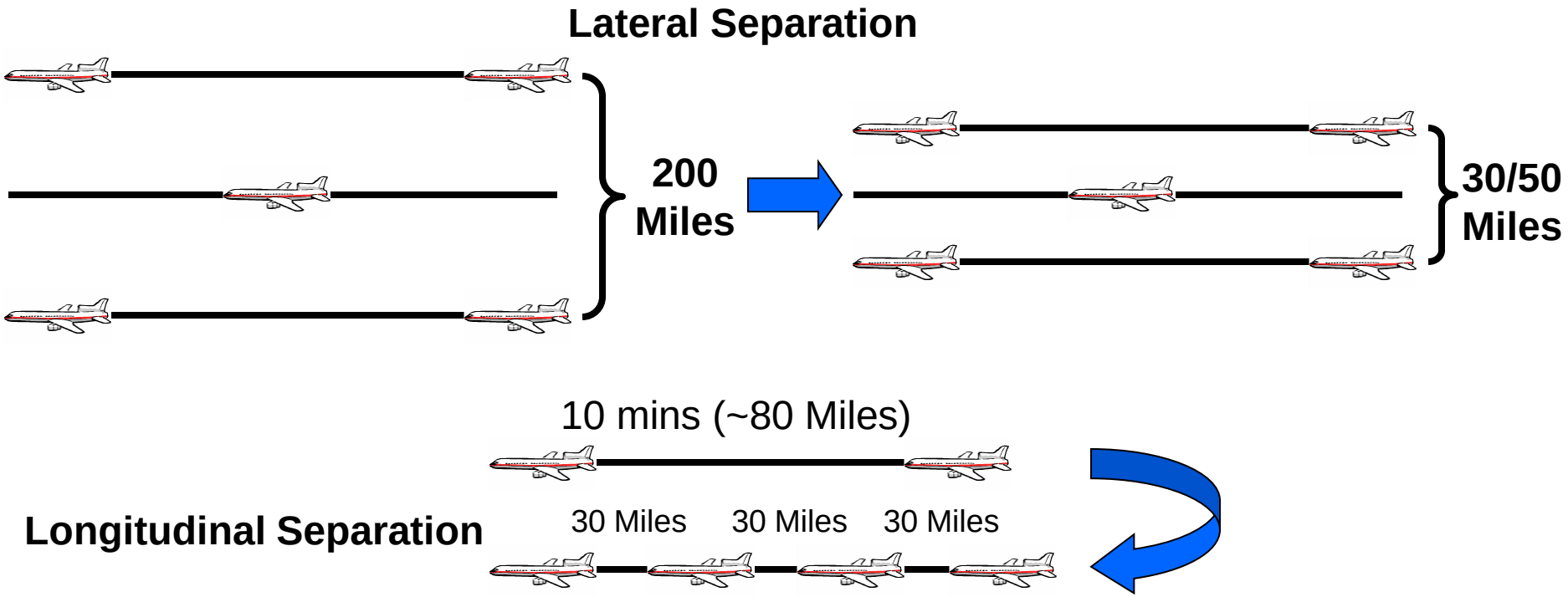
Used almost always. Releases altitudes for other aircraft and reduces conflict reporting.

Reduced Lateral and Longitudinal Separation Standards

30/30 and D50

- On 10 December 2013, the United States reduced the ***lateral*** spacing between ADS-C and CPDLC connected RNP-4 aircraft operating in the entire New York Oceanic CTA from 50 NM down to 30 NM.
- Additionally, the ***longitudinal*** spacing of these same aircraft was reduced from 80 NM down to 30 NM.
- The ***longitudinal*** spacing of ADS-C and CPDLC connected RNP-10 aircraft was reduced from 80 NM down to 50 NM.

30/30/D50 Graphical Depiction



ATOP Improved Efficiencies Using 30/30/D50

- As a result of these reductions, altitude requests which were previously denied due to traffic are now being granted.
- We are now able to accommodate more altitude, WX deviation and route requests.
- The use of 30/30 and D50 also enable us to transition aircraft to altitudes that other ANSPs may require due to traffic in their FIR.
- This has resulted in greater efficiency for both the provider (KZWY) and the user.

The Bottom Line

- **Best Equipped-Best Served**
  - RNP4/10 and FANS-1/A aircraft receive better routes, altitudes, WX deviations, etc
- **Greater Flexibility**
  - More planes are able fly their preferred routes
- **Greater Capacity**
  - Automation handles all of the tasks that once had to be manually done.
  - Allows controller to handle more aircraft with less effort
- Response times to aircraft requests have dropped dramatically. Average response time before Ocean21 was 9 minutes. Current response time averages 2 minutes (CPDLC even less).

New York Center Datalink Procedures

Datalink Procedures

The logon for the entirety of New York Center CTA/FIR, both east and west is: **KZWY**

Flight crews *must* logon to both CPDLC and ADS-C

ADS-C contracts are set for:

WPC – Waypoints

LDE – Lateral Deviation Events – set to 5NM or greater

PER – Periodic reporting set to:

1216 seconds for RNP-10

576 seconds for RNP-4

On Demand Contracts are also available at any time for control personnel

Contract parameters can be modified dynamically if necessary

* In 2016, FAA will add Level Range Deviation Event contracts (LRDE)

LOGON Procedures for Aircraft entering the KZWY Data-link service area from NON-Data-link airspace.

- Log on to KZWY at least 15 minutes but not more than 45 minutes prior to entering the KZWY Data-link service area.
- Aircraft that depart from KEWR must remember to logoff from their terminal datalink before attempting logon with KZWY

LOGON Procedures for Aircraft Entering/Exiting the KZWY Data-link Service Area From Adjacent Data-link Airspace.

- ADS-C and CPDLC services will transfer automatically between Santa Maria, Gander Oceanic and New York.
- CPDLC will transfer automatically between Moncton, Gander Oceanic and New York.
- Pilots should check the ACTIVE Center as they cross the FIR boundary inbound to New York to ensure that the KZWY is the ACTIVE Center. When exiting New York Oceanic airspace, check to ensure the connection is ACTIVE with correct next ANSP.
- If the active center is not correct within 5 minutes after the boundary is crossed, pilots shall ensure all open uplinks from the previous ATC unit have been responded to, then terminate the CPDLC connection and log on to KZWY.

HF Communications Requirement for Data-Link Aircraft

- Prior to entering the KZWY Oceanic area, contact New York Radio (ARINC) on HF or VHF and;
  1. If the flight will exit ZNY oceanic airspace into downstream oceanic airspace:
     - identify the flight as A-D-S equipped
     - state the name of the next OCA/FIR to be entered
     - request a SELCAL check
- Expect to receive primary and secondary HF frequency assignments from New York Radio for the route of flight within the Data-link service area. Pilots must maintain HF communications capability with New York Radio at all times within the entire New York Oceanic FIR. It should be noted that ARINC may require flights to contact them at 60 West for HF frequency updates.

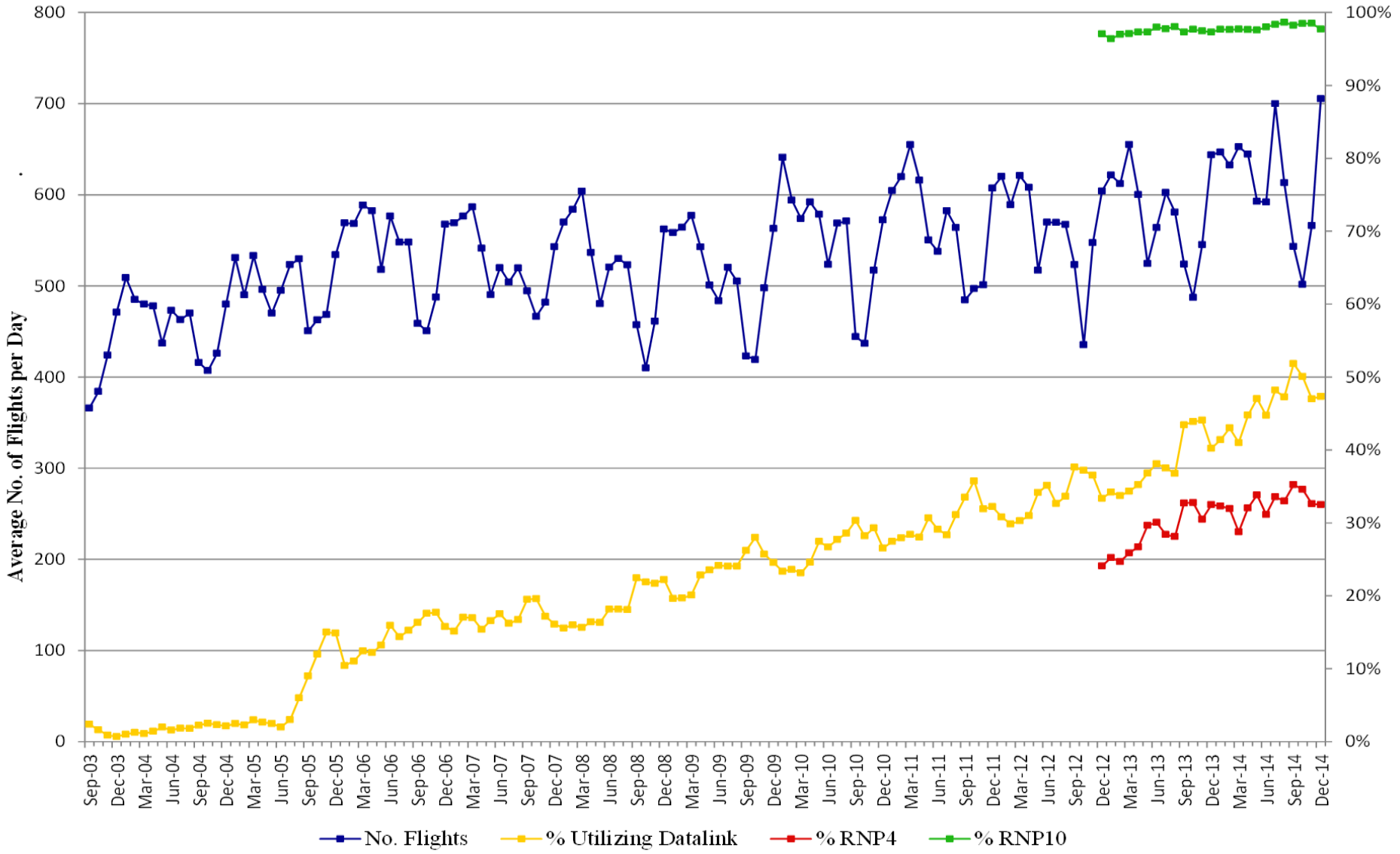
Position Reporting- Data-Link

- After entering the New York Oceanic FIR (KZWY), normal waypoint position reports will be received via ADS.
- Due to the types of ADS contracts that are established, time revisions need not be passed via CPDLC or HF.
- Operators should ***NOT***use CPDLC for position reports. If ADS is not available, revert to HF voice position reports.
- **DO** use CPDLC for clearance requests, or for communication not associated with waypoint position reports.
- The ATOP system cannot accept CPDLC position reports containing latitude and longitude (Lat/Long) in ARINC 424 format (e.g. 4050N). CPDLC position reports containing Lat/Long waypoints within the KZWY Data-link service area will be accepted in whole latitude and longitude format only (e.g. 40N050W).

Current Datalink Equipage Statistics

Current Datalink Equipage Statistics

	NAT	WATRS		NAT	WATRS	NAT	WATRS		NAT	WATRS	
	Total Operations			% Total Operations		Number Data Link Operations			% Data Link within Airspace		
Month-Year	OCA East	OCA West	All ZNY	OCA East	OCA West	OCA East	OCA West	All ZNY	OCA East	OCA West	All ZNY
Jan-14	9048	16979	20035	45.16%	84.75%	6813	6350	8299	75.30%	37.40%	41.42%
Feb-14	8021	15239	17712	45.29%	86.04%	6161	6020	7621	76.81%	39.50%	43.03%
Mar-14	8478	17514	20231	41.91%	86.57%	6596	6500	8296	77.80%	37.11%	41.01%
Apr-14	8914	16534	19332	46.11%	85.53%	7079	6737	8655	79.41%	40.75%	44.77%
May-14	9040	15808	18375	49.20%	86.03%	7274	6955	8644	80.46%	44.00%	47.04%
Jun-14	8314	15463	17757	46.82%	87.08%	6555	6538	7944	78.84%	42.28%	44.74%
Jul-14	11407	17474	21697	52.57%	80.54%	9117	7726	10457	79.92%	44.21%	48.20%
Aug-14	9914	16144	19005	52.17%	84.95%	7840	7203	8984	79.08%	44.62%	47.27%
Sep-14	9245	13299	16297	56.73%	81.60%	7382	6627	8449	79.85%	49.83%	51.84%
Oct-14	8103	13021	15550	52.11%	83.74%	6638	6097	7786	81.92%	46.82%	50.07%
Nov-14	8023	14699	16987	47.23%	86.53%	6568	6486	7985	81.86%	44.13%	47.01%
Dec-14	10316	18510	21862	47.19%	84.67%	8599	8010	10349	83.36%	43.27%	47.34%


ZNY Flights & Equipment Utilization
Average No. of Flights per Day
800
700
600
500
400
300
200
100
0
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
Dec-05
Mar-06
Jun-06
Sep-06
Dec-06
Mar-07
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Sep-10
Dec-10
Mar-11
Jun-11
Sep-11
Dec-11
Mar-12
Jun-12
Sep-12
Dec-12
Mar-13
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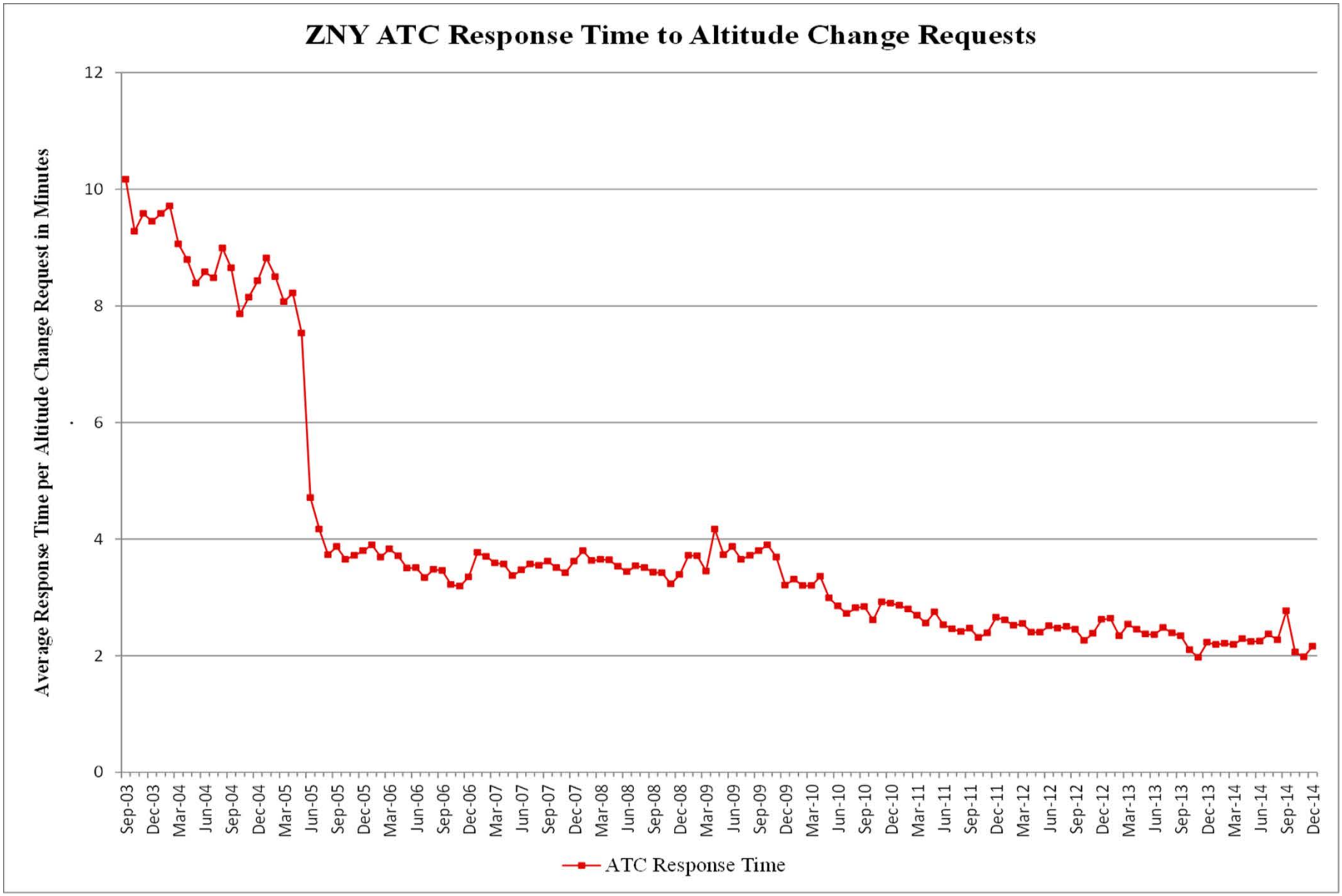
Sep-14
Dec-14
No. Flights
% Utilizing Datalink
% RNP4
% RNP10


ZNY ATC Response Time to Altitude Change Requests
Average Response Time per Altitude Change Request in Minutes
12
10
8
6
4
2
0
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
Dec-05
Mar-06
Jun-06
Sep-06
Dec-06
Mar-07
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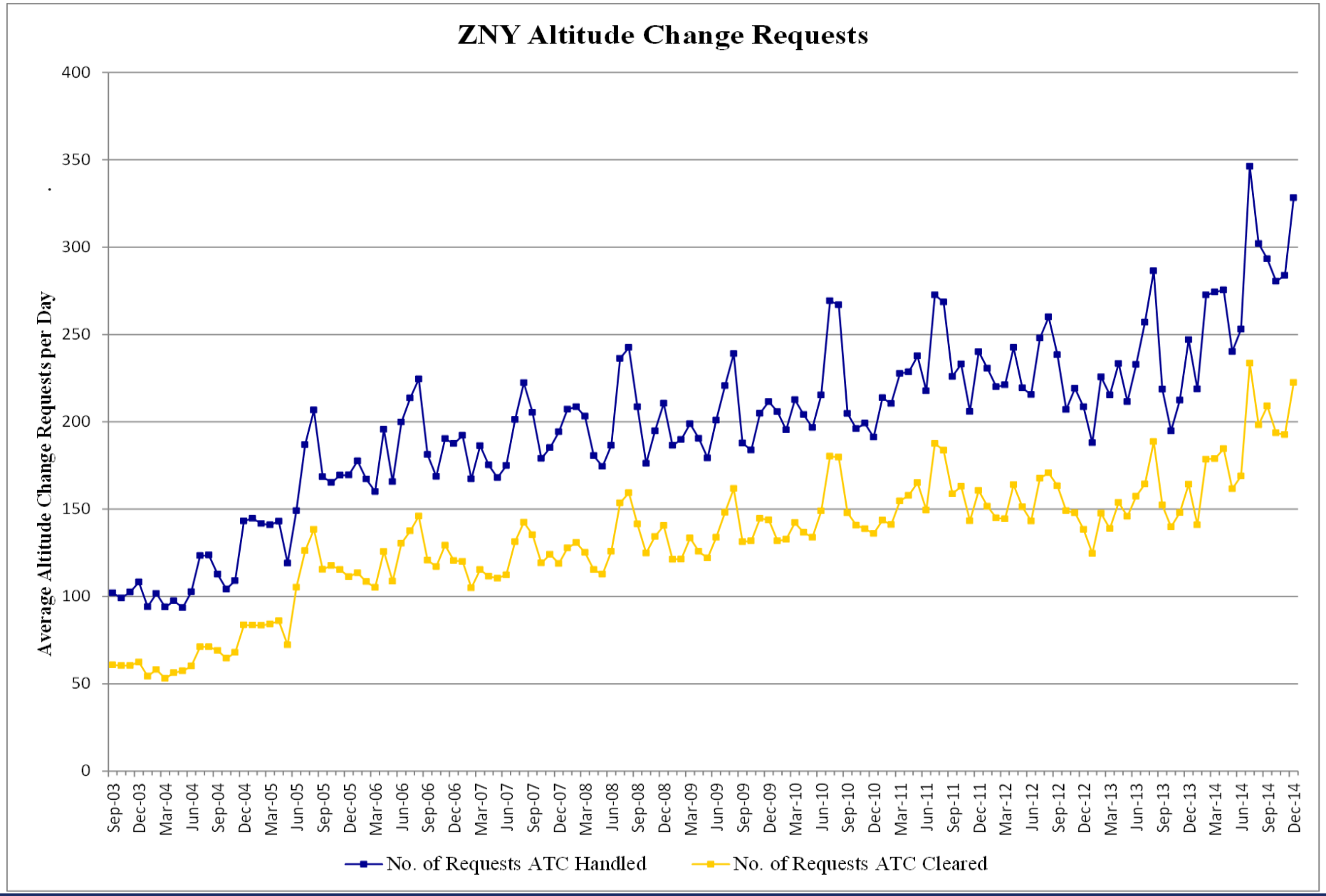
Dec-14
ATC Response Time


ZNY Altitude Change Requests
Average Altitude Change Requests per Day
400
350
300
250
200
150
100
50
0
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
Dec-05
Mar-06
Jun-06
Sep-06
Dec-06
Mar-07
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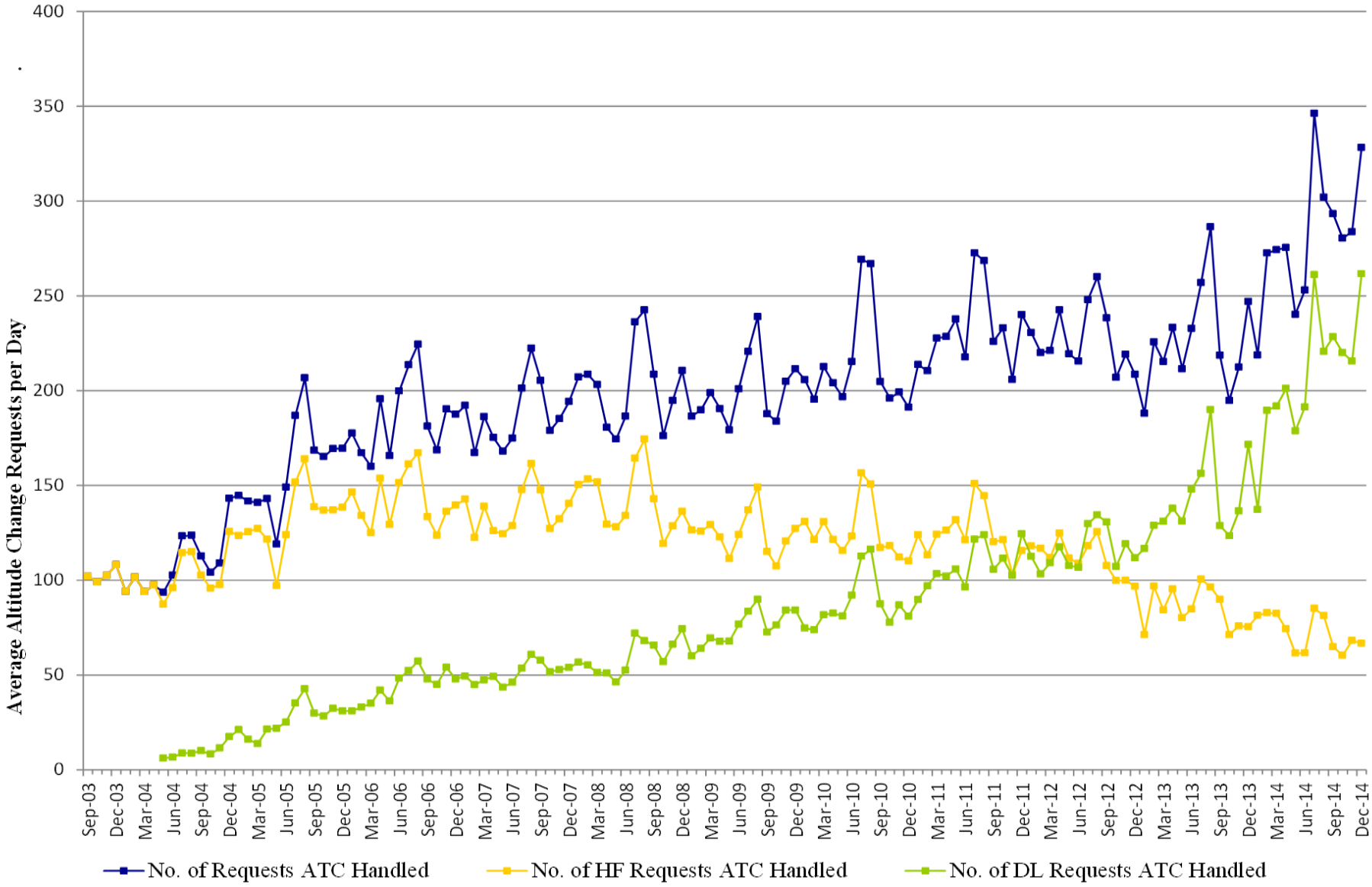
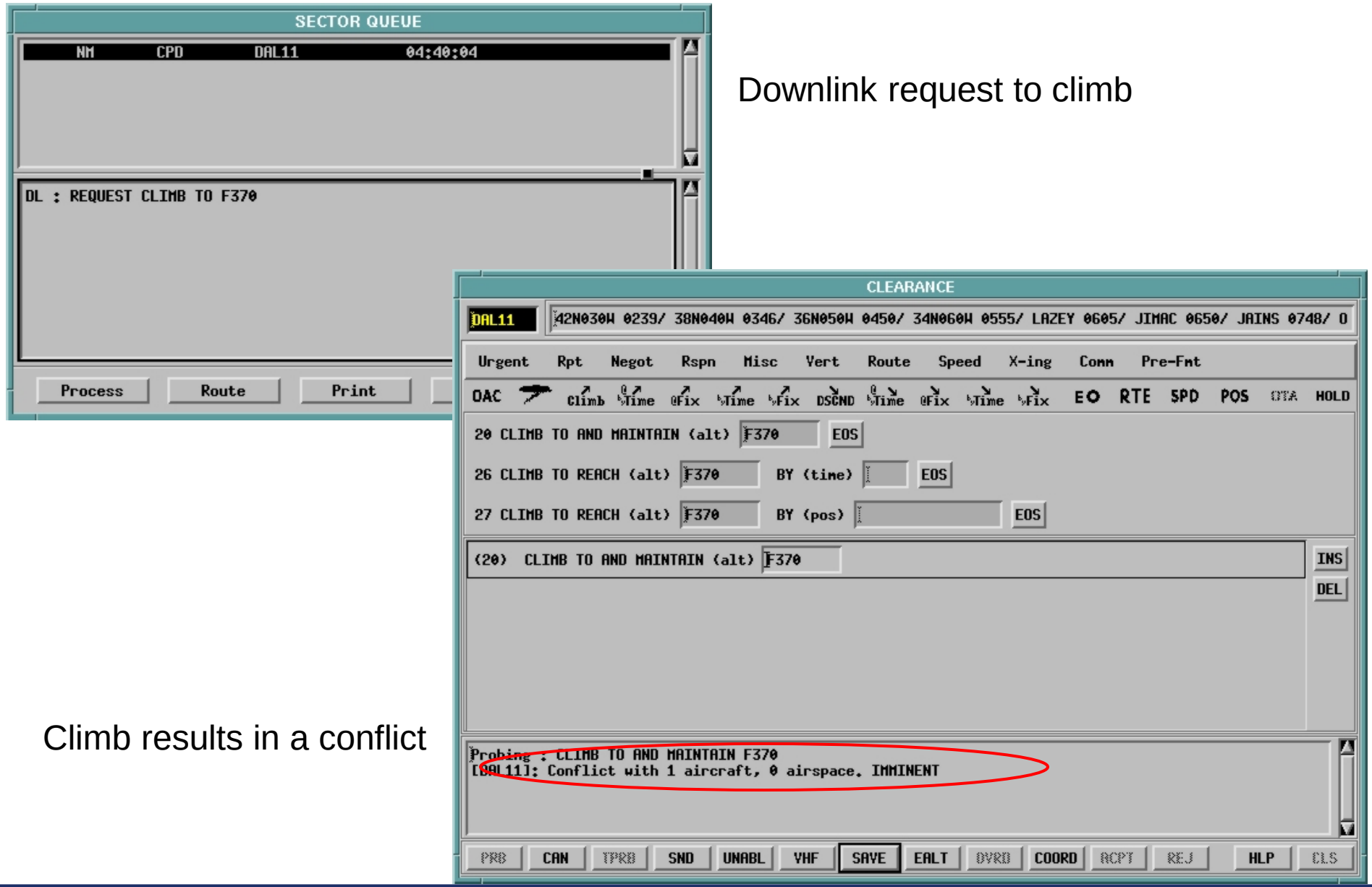
Sep-11
Dec-11
Mar-12
Jun-12
Sep-12
Dec-12
Mar-13
Jun-13
Sep-13
Dec-13
Mar-14
Jun-14
Sep-14
Dec-14
No. of Requests ATC Handled
No. of Requests ATC Cleared

ZNY Altitude Change Requests ATC Handled

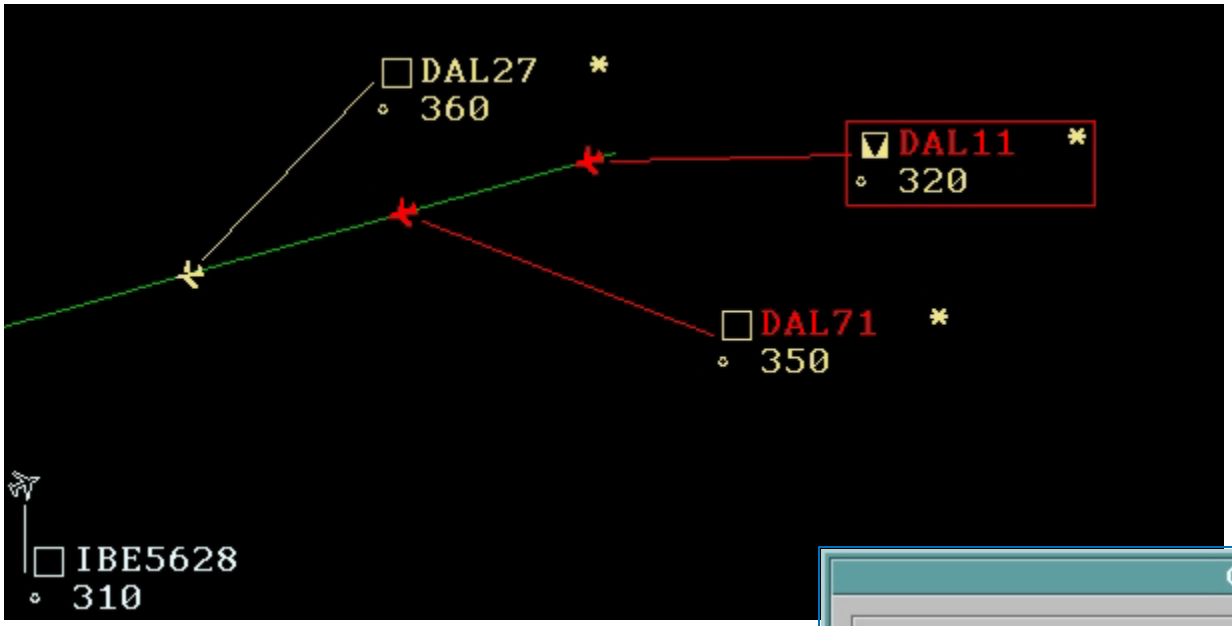


Example of Application of RNP4 30/30 Separation



Downlink request to climb

Climb results in a conflict



Aircraft on Display

Conflict details. Note that time is being used.

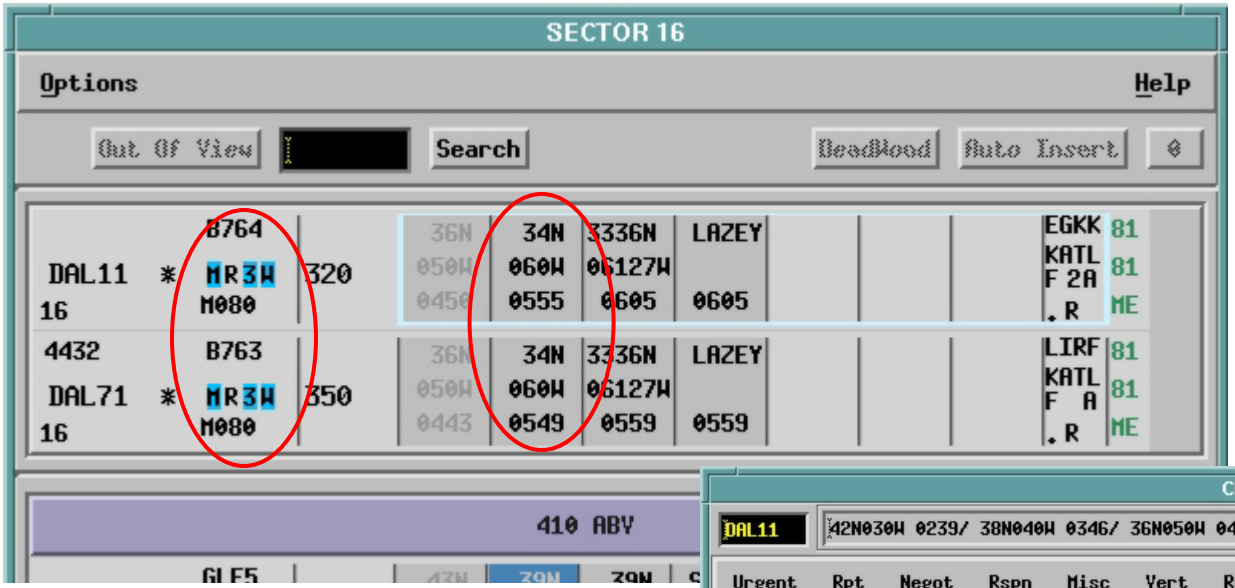
CONFLICT REPORT

same direction REQUIRED 10 minutes (50 nm) 1000 ft

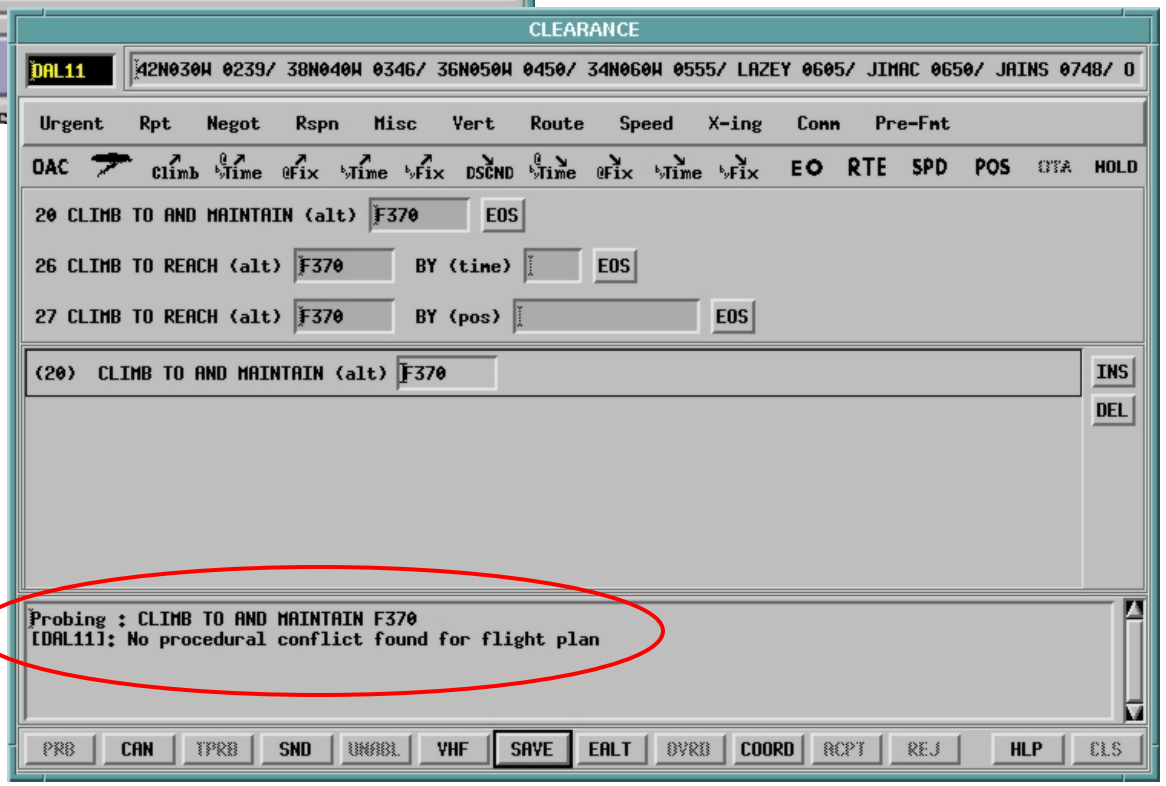
0.0 degrees LOS NOW ACTUAL 6 min 52 sec (0 nm) 0 ft

		PASSING POINT			CONFLICT SEGM	
B764 *DAL11 M080	F320 F370				3555N 05033W 0453	3350N 06037W 0559
B763 DAL71 M080	F350				3544N 05137W 0453	3335N 06130W 0559

Draw Close

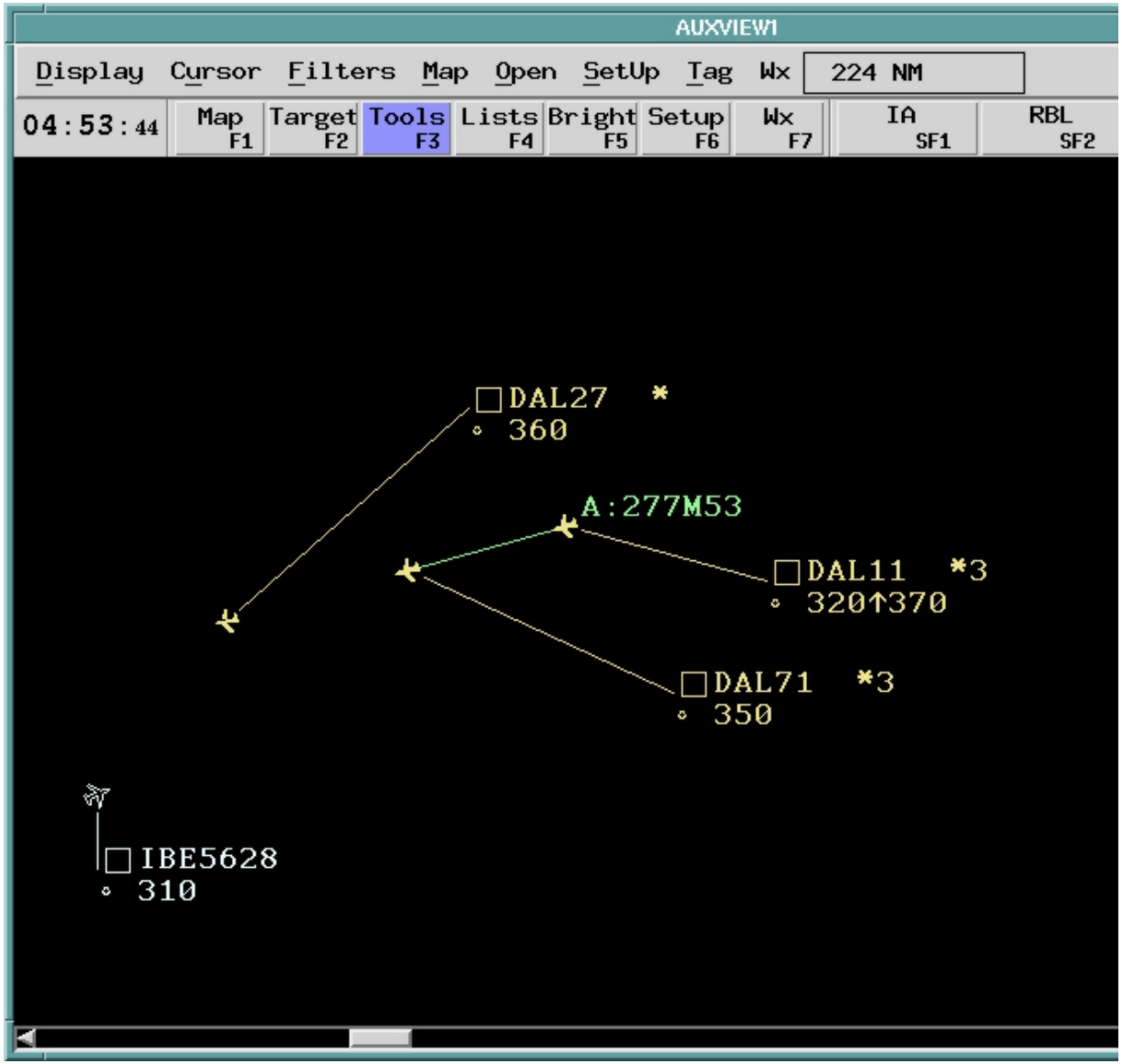


30/30 is applied. Note the in-trail time for 60W. Both aircraft are RNP-4.



Same climb now results in no conflict because distance, and not time, is being used.

Aircraft are 53 nm in trail.
Climb is good.

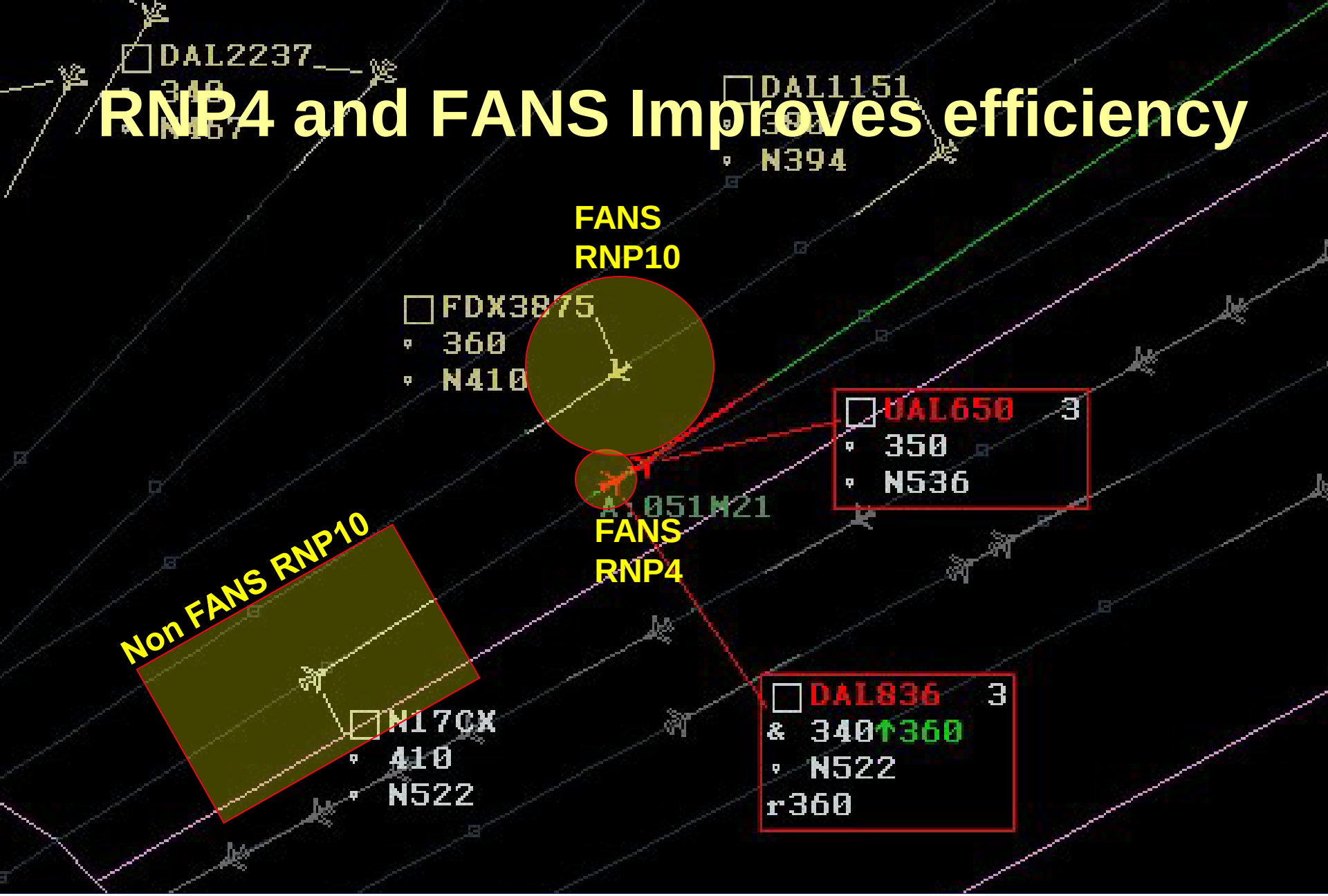


RNP-4 Fuel and Emissions Savings Presentation

Lost Fuel Burn Savings

The following slides identify denied aircraft requests for climb to optimum altitudes and places a value on the increased fuel burn due to lack of FANS equipment and RNP certification

RNP4 and FANS Improves efficiency



Fuel Burn Below Optimum Altitude

- **Worked with operators and IATA to develop a table of extra fuel burn when operating below optimum altitude.**
- **Chart is listed in Attachment A**

Aircraft Type A320, Flight length 2500NM, Average weight

Altitude	Ave Additional Fuel burn per hour kg
1000 ft below optimum altitude	36
2000 ft below optimum altitude	72
3000 ft below optimum altitude	118
4000 ft below optimum altitude	172
5000 ft below optimum altitude	254
6000 ft below optimum altitude	336

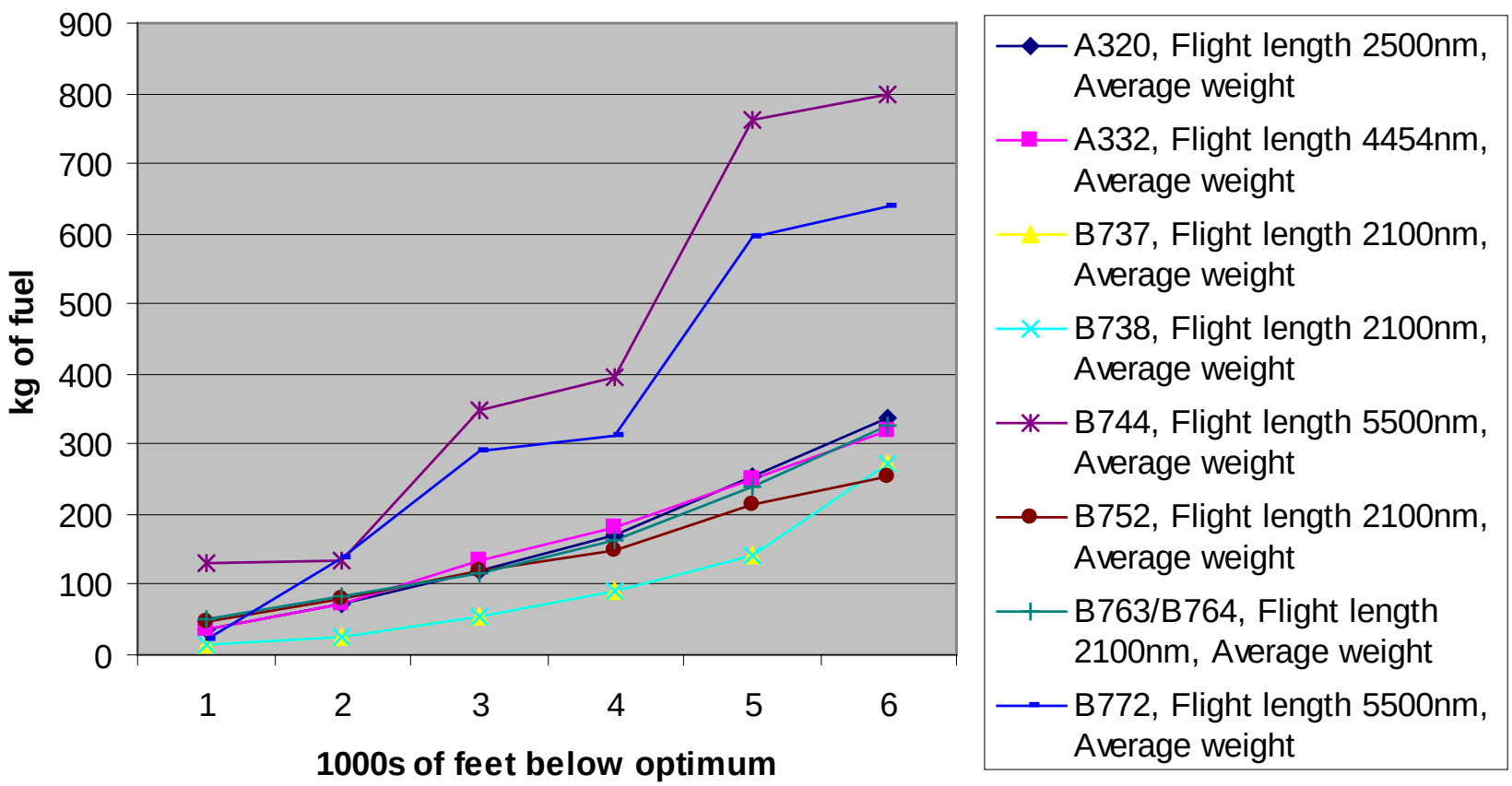
No data used B757 data

Aircraft Type A332, Flight length 4454NM, Average weight

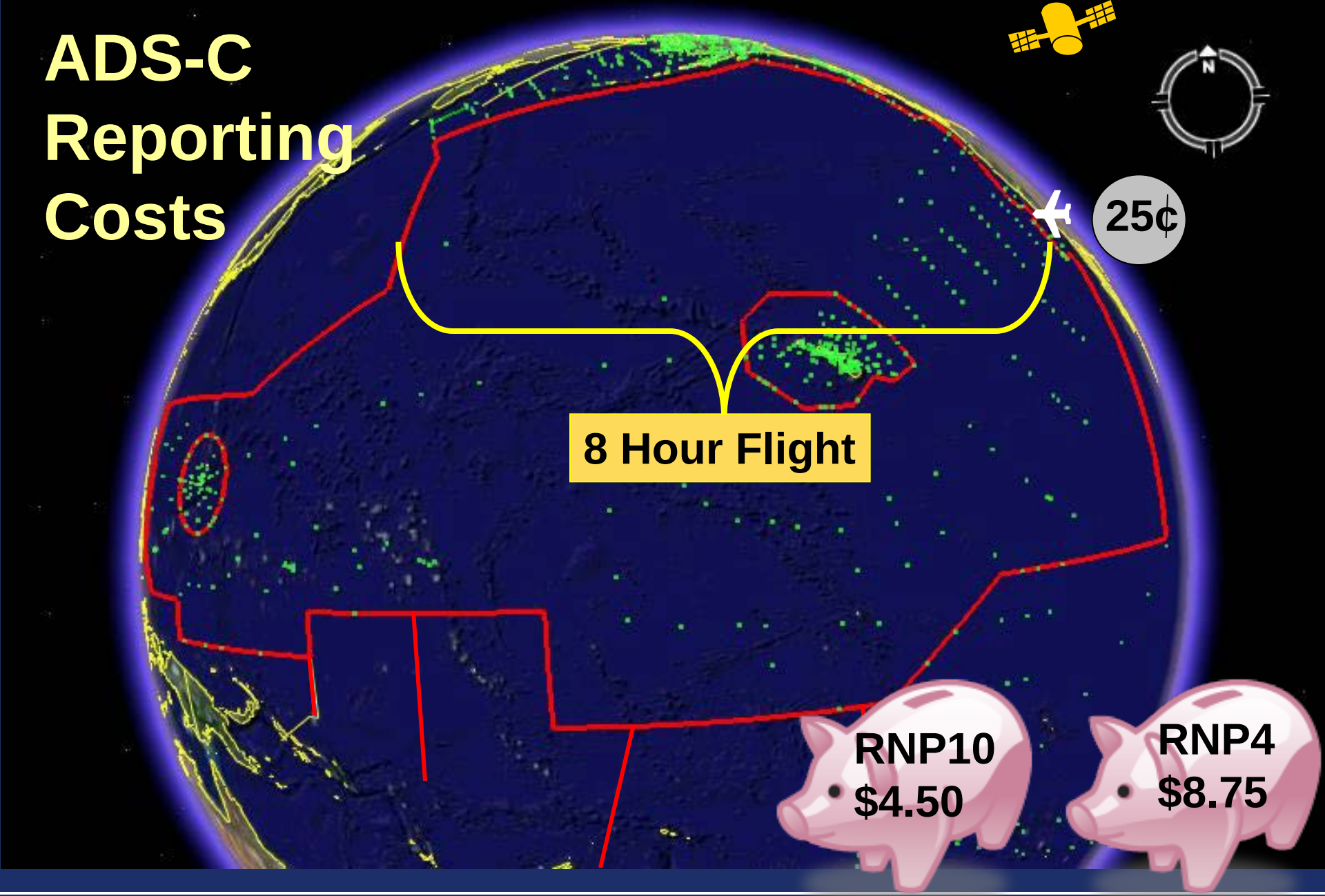
Altitude	Ave Additional Fuel burn per hour kg
1000 ft below optimum altitude	35
2000 ft below optimum altitude	71
3000 ft below optimum altitude	136
4000 ft below optimum altitude	182
5000 ft below optimum altitude	251
6000 ft below optimum altitude	321

Extrapolated Data

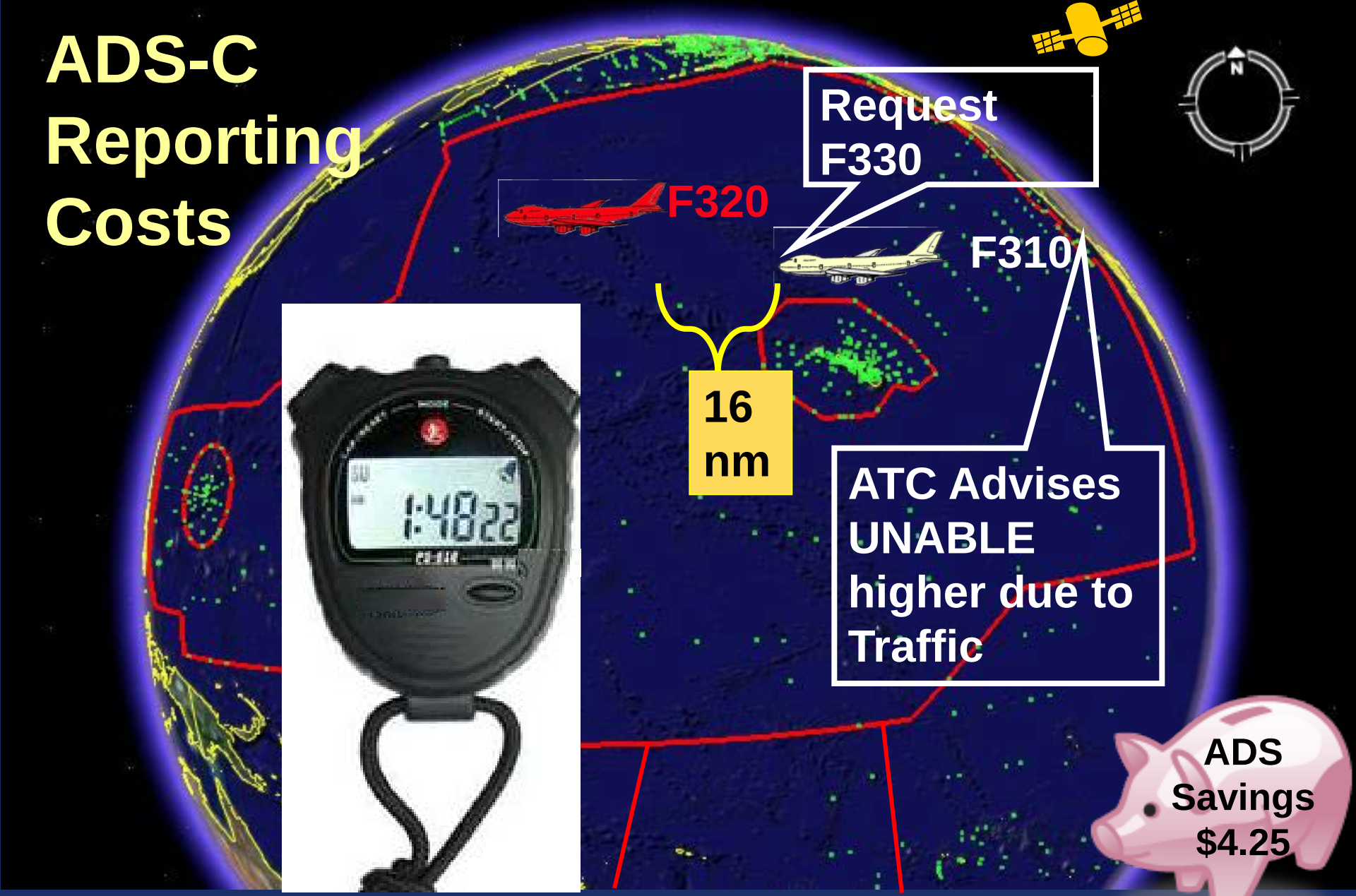
Impact of Denied Altitude Change Requests



ADS-C Reporting Costs

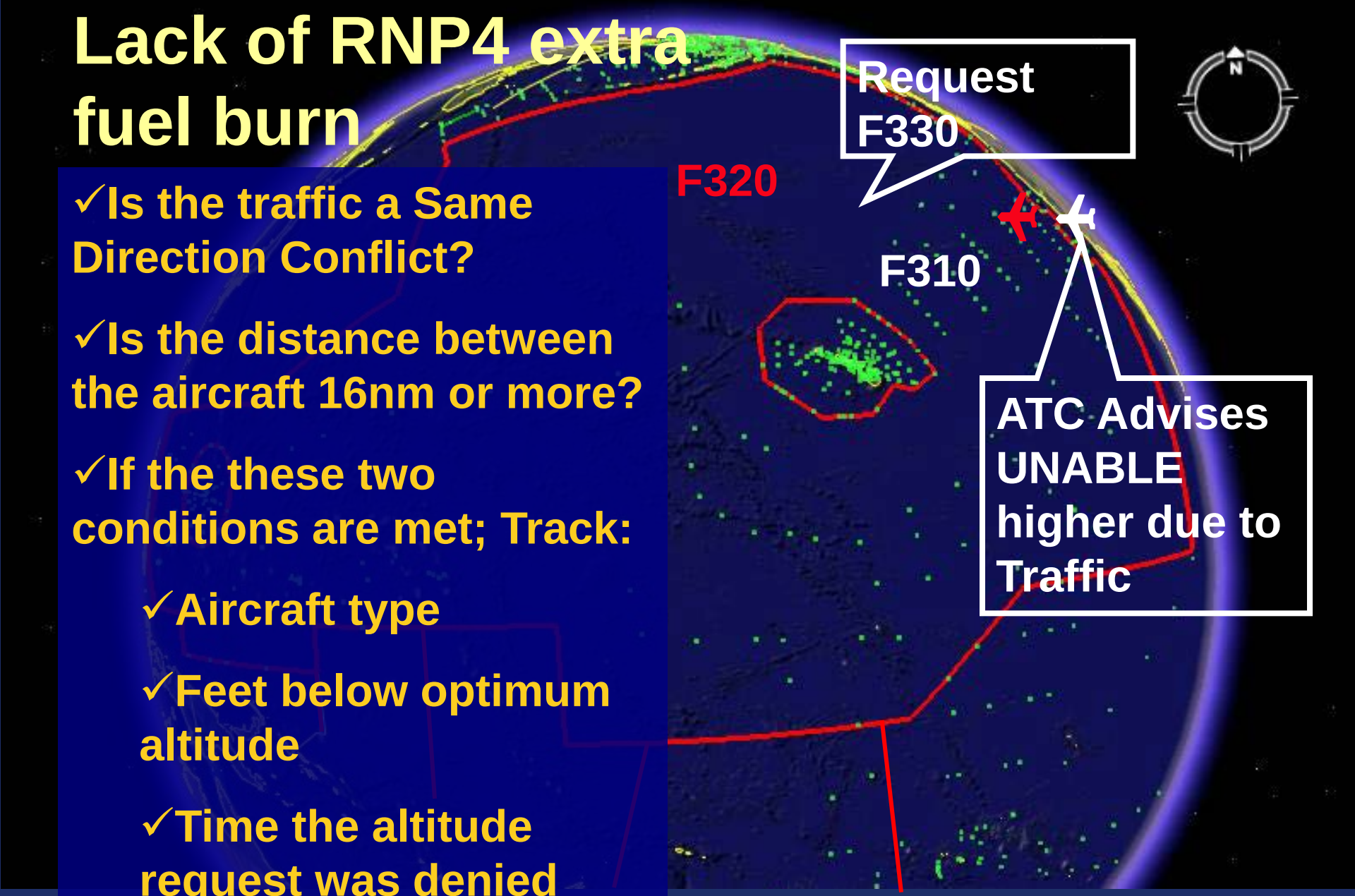


ADS-C Reporting Costs

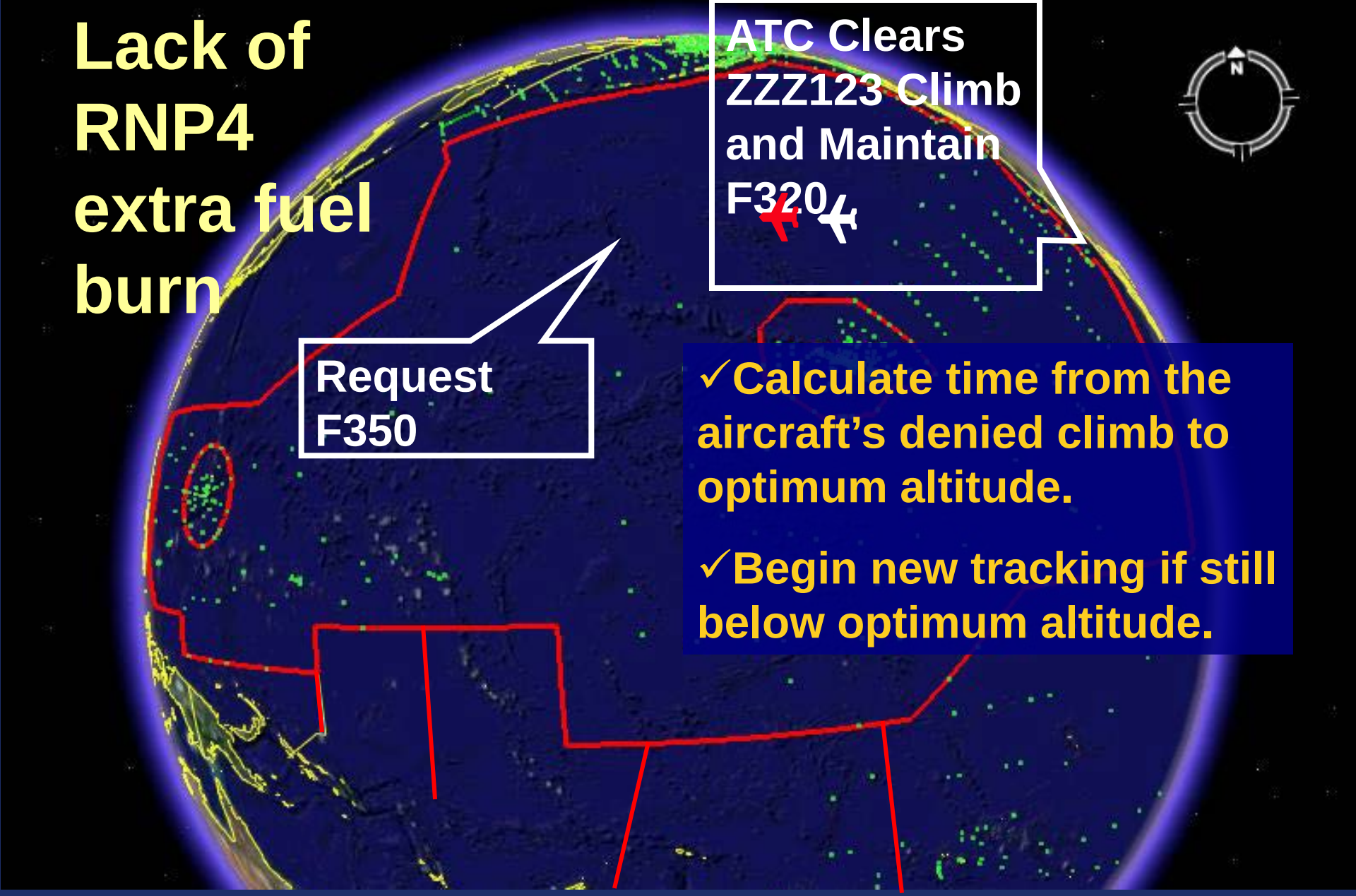


Lack of RNP4 extra fuel burn

- ✓Is the traffic a Same Direction Conflict?
- ✓Is the distance between the aircraft 16nm or more?
- ✓If the these two conditions are met; Track:
  - ✓Aircraft type
  - ✓Feet below optimum altitude
  - ✓Time the altitude request was denied

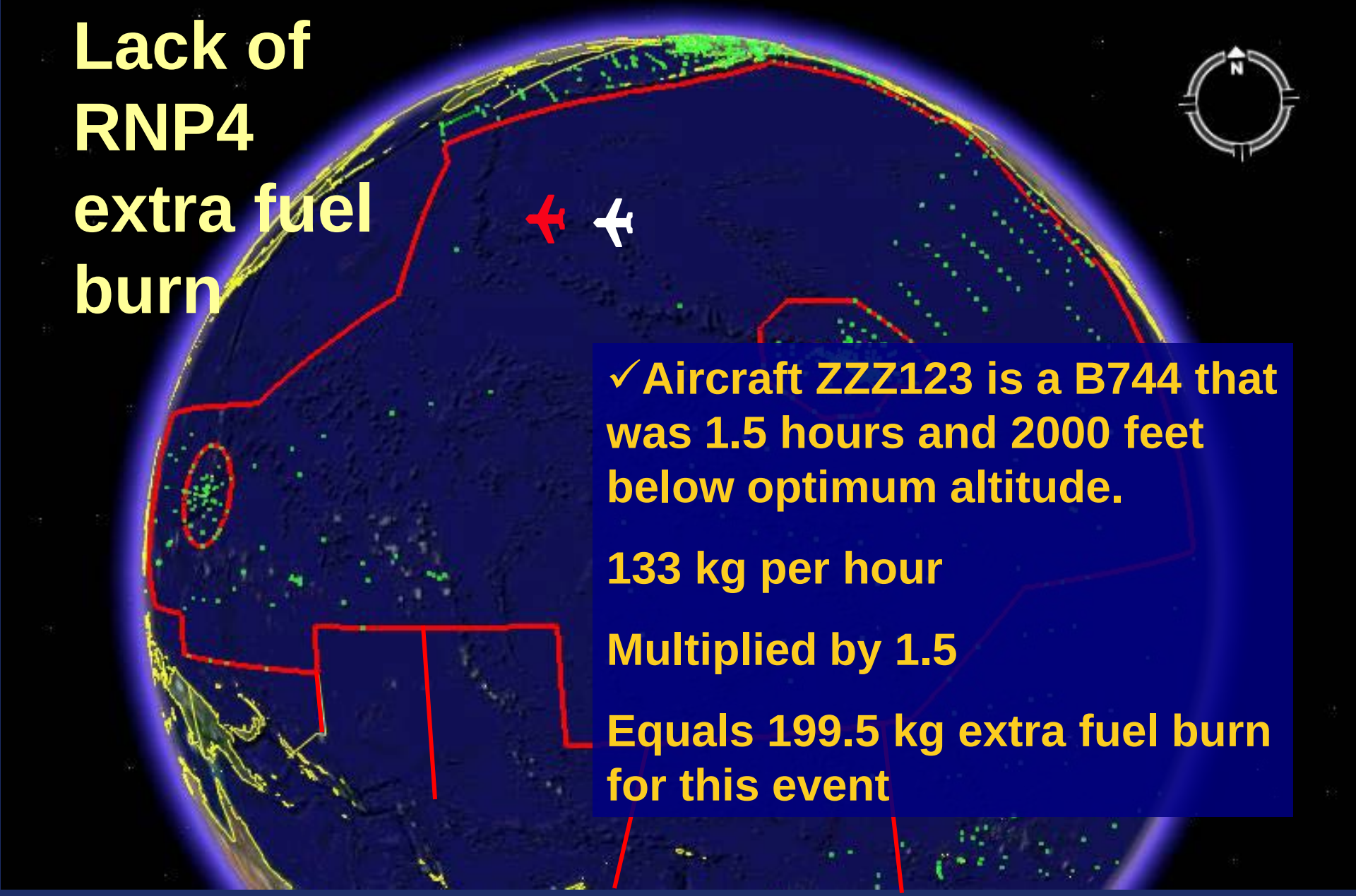


Lack of RNP4 extra fuel burn

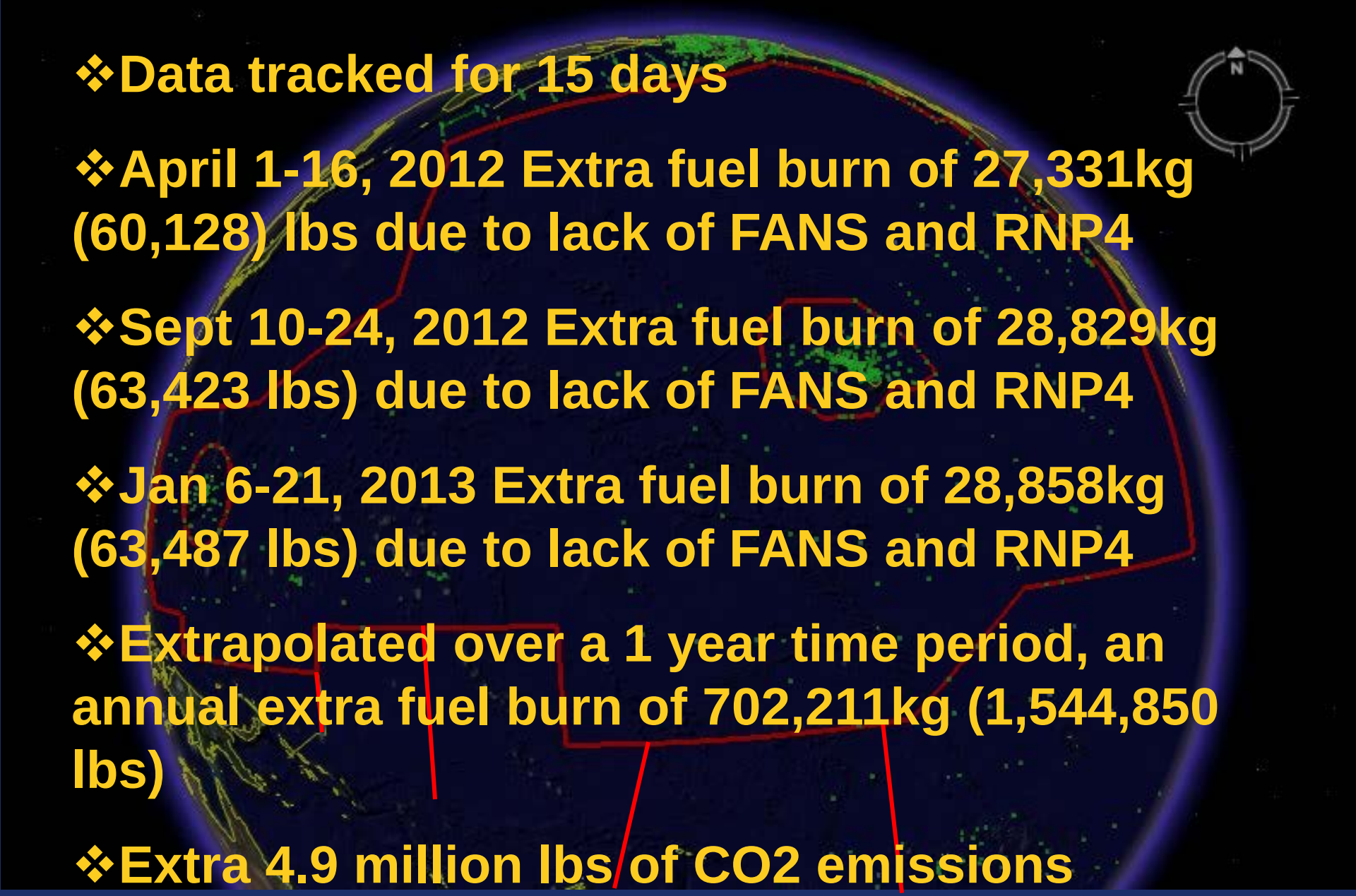


- ✓Calculate time from the aircraft's denied climb to optimum altitude.
- ✓Begin new tracking if still below optimum altitude.

Lack of RNP4 extra fuel burn



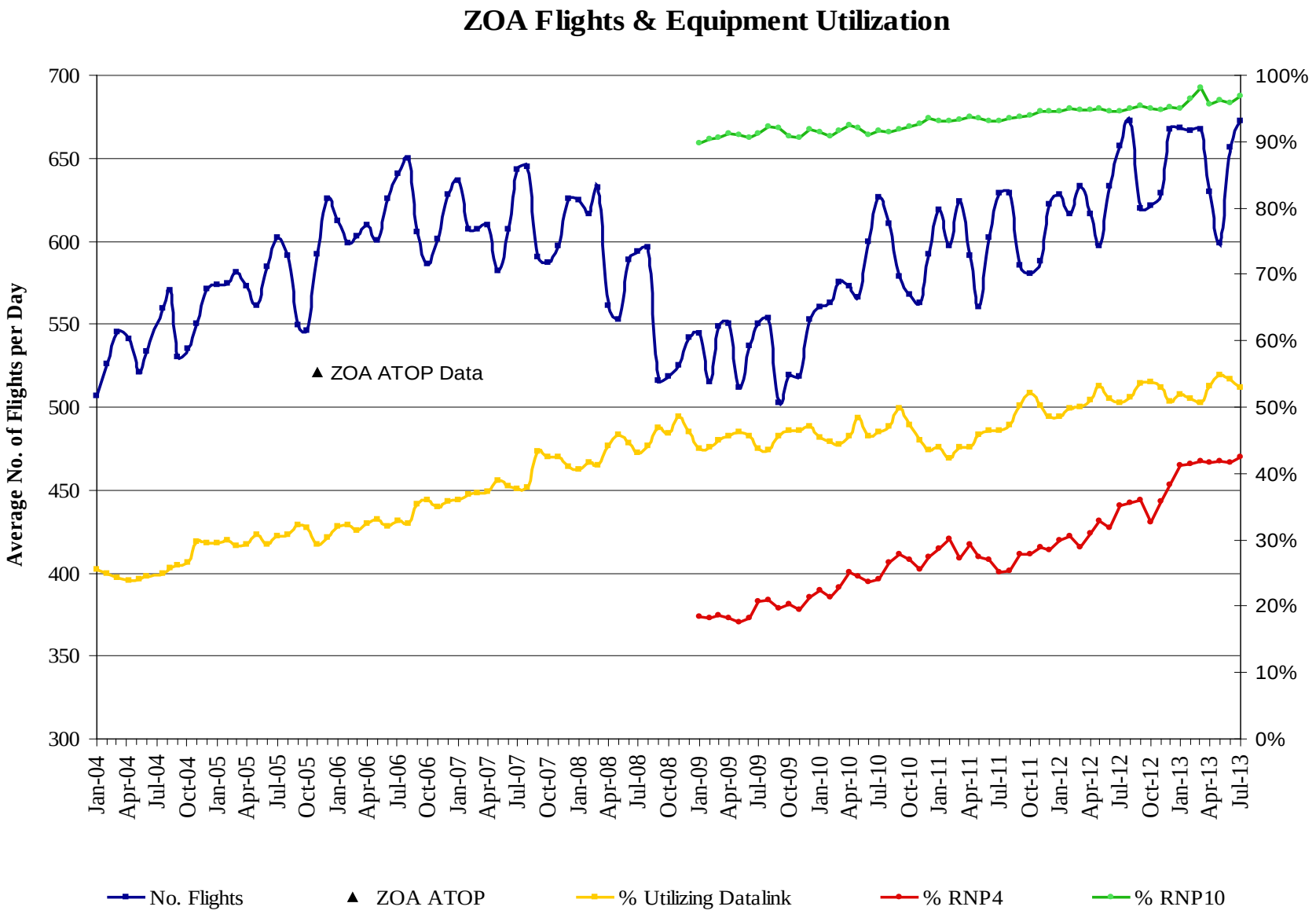
- ✓Aircraft ZZZ123 is a B744 that was 1.5 hours and 2000 feet below optimum altitude.
- 133 kg per hour
- Multiplied by 1.5
- Equals 199.5 kg extra fuel burn for this event



- Data tracked for 15 days
- April 1-16, 2012 Extra fuel burn of 27,331kg (60,128) lbs due to lack of FANS and RNP4
- Sept 10-24, 2012 Extra fuel burn of 28,829kg (63,423 lbs) due to lack of FANS and RNP4
- Jan 6-21, 2013 Extra fuel burn of 28,858kg (63,487 lbs) due to lack of FANS and RNP4
- Extrapolated over a 1 year time period, an annual extra fuel burn of 702,211kg (1,544,850 lbs)
- Extra 4.9 million lbs of CO_2 emissions

Lack of RNP4 extra fuel burn

- Data tracked for 15 days (Sept 1-16, 2013)
- Extra fuel burn of 21,310 kilograms (kg) (46,882 lbs) due to lack of FANS and RNP4
- Extrapolated over a 1 year time period, an annual extra fuel burn of 518,543 kg (1,140,795 lbs)
- Extra 1.6 million kg of CO_2 emissions


ZOA Flights & Equipment Utilization
Average No. of Flights per Day
700
650
600
550
500
450
400
350
300
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
▲ ZOA ATOP Data
Jan-04
Apr-04
Jul-04
Oct-04
Jan-05
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Jul-05
Oct-05
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
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Jan-11
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Jan-12
Apr-12
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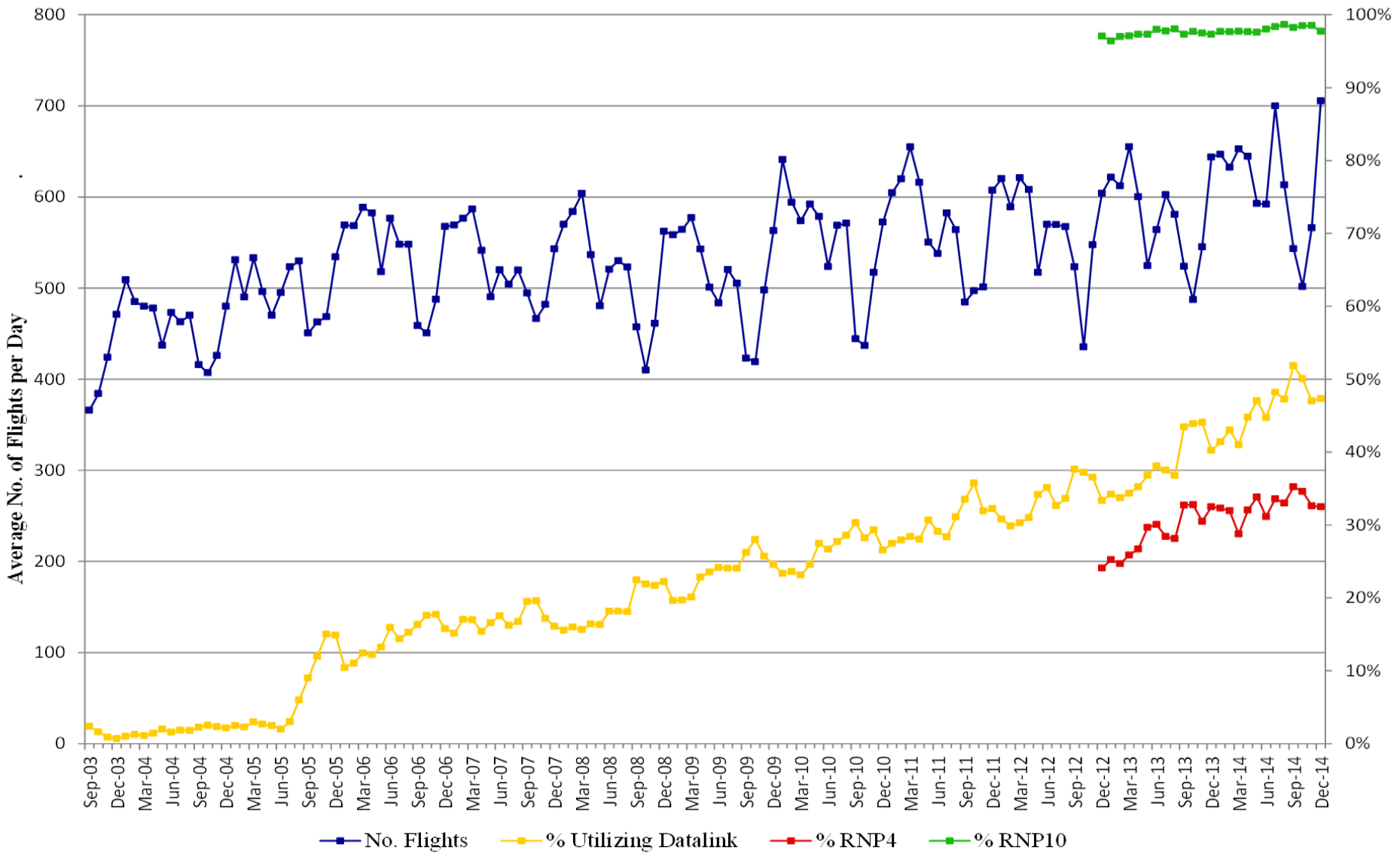
Oct-12
Jan-13
Apr-13
Jul-13
No. Flights
▲ ZOA ATOP
% Utilizing Datalink
% RNP4
% RNP10


ZNY Flights & Equipment Utilization
Average No. of Flights per Day
800
700
600
500
400
300
200
100
0
100%
90%
80%
70%
60%
50%
40%
30%
20%
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Mar-14
Jun-14
Sep-14
Dec-14
No. Flights
% Utilizing Datalink
% RNP4
% RNP10

RNP4 Aircraft extra fuel burn

- Data tracked for 15 days (Sept 1-16, 2013)
- Extra fuel burn of 13,534 kilograms (kg) (29,744 lbs) due to lack of FANS and RNP4
- Extrapolated over a 1 year time period, an annual extra fuel burn of 329,282 kg (724,420lbs)

Additional benefits are not tracked

- 30nm separation after two opposite direction aircraft have passed

- If an aircraft is held below optimum altitude because of traffic and does not make requests for a new optimum altitude.

Additional benefits are not tracked

- Savings that could be realized by developing route systems based on a 30nm lateral standard.

- This paper only captures the lost savings for the Oakland FIR. It would be much higher if calculated for all FIRs

Conclusion

- **The meeting is requested to:**
  - **Recognize the benefits of RNP 4 and FANS equipage; and**
  - **Consider certifying FANS equipped aircraft as RNP 4; and**
  - **Consider equipping aircraft with satellite FANS and RNP 4 certification.**

Radio Communications Requirements

Radio Communications Requirements

The language contained in FAR 91.511 has generated a lot of confusion for aircraft operators when determining what equipment is required as pertains to flights in New York Oceanic Airspace. Regarding communications requirements, The following rules apply:

ICAO Annex 2, Chapter 3.6.5: Communications

3.6.5.1: An aircraft operated as a controlled flight shall maintain continuous air-ground voice communication watch on the appropriate communication channel of, and establish two-way communication as necessary, with, the appropriate air traffic control unit.

.

Radio Communications Requirements

FAR 91.511 – Communication and Navigation Equipment for Overwater Operations

91.511 (a)(1): Radio communication equipment appropriate to the facilities to be used and able to transmit to, and receive from, at least one communication facility along the route:

(i) Two transmitters

(ii) Two microphones

(iii) Two headsets or one headset and one speaker

(iv) Two independent receivers

The only *radio* equipment that meets this communications requirement is **HF**

Radio Communications Requirements

Many aircraft operators are incorrectly interpreting language contained in FAR 91.511 (a)(2)(f)(2), which states:

“Flight conditions and the aircraft’s capabilities are such that no more than a 30 minutes gap in two-way radio VHF communications is expected to exist”

Aircraft operators incorrectly believe this means you may operate a flight in New York Oceanic without HF Radio equipage as long as that portion of flight outside of VHF coverage does not exceed 30 minutes. However, the above section, if read properly, refers back to the requirements for electronic navigational equipment , and NOT communications. Thus, this rule states that you may operate a flight in the area described in (a)(2)(f) with a single long range navigation system appropriate for the route as long as the route segment only extends 30 minutes or less beyond VHF coverage.

Bottom Line: Two working HF radios are required for operations in New York Center Oceanic. There are NO waivers that can be issued by New York Center that deviate from this rule. *However* …

Single HF Radio Letters of Agreement

OPSPEC B045 allows Airlines and Aircraft operators (companies) to enter into a Letter of Agreement (LOA) directly with New York Center that will allow the company/airline to operate flights that are wholly contained in the New York Center OCA West (remaining west of 60W longitude and South of 39N latitude for all portions of the flight) with a ***single*** operating HF radio.

This is the ONLY way for airlines and companies to operate flights over specified oceanic areas with less than two operable HF radios, and one is still required.

NOTE: Satellite Voice Communication (SATCOM) is still NOT approved to meet any of the overwater radio equipage requirements, to replace HF radios. However, it still provides an alternate means of communications in the event of any system failure, either ground based on in the flight deck, that may occur.

Rockwell-Collins ARINC Presentation

Flight Planning Requirements

ICAO Flight Plan AFTN Addressing For Operations in the entire New York Oceanic CTA/FIR, East or West.

- All flights entering the New York Oceanic CTA/FIR shall address ICAO FPL messages to the following two AFTN addresses:

  KZWYZOZX – New York Center ATOP system

  KZNYZRZD – New York Center flight plan repository
- CHG messages should be filed to update a previous FPL
- If a new FPL needs to be filed, a CNL must be sent first to remove the old FPL.
- All flights entering the New York Oceanic CTA/FIR and a U.S. ARTCC (except Boston) and/or Bermuda airspace shall address FPLs to both KZWYZOZX and the appropriate U.S. ARTCC
- The ATOP system will *always* consider the last FPL received in the system as the valid flight plan.

Flight Planning Requirements

- 30 NM lateral, 50 NM lateral, 30 NM longitudinal and 50 NM longitudinal separation is applied in the ***entire*** New York Oceanic CTA/FIR with aircraft authorized RNP10 or RNP4, regardless of altitude.
- If operating in in the OCA West (formerly WATRS) only, you must file your RNP4 or RNP10 capability in your FPL.
- If operating in the NAT, you must file both your MNPS and RNP4/RNP10 capability in your FPL.
- If operators do not address flight plans to KZWYZOZX containing the proper information, reduced lateral and longitudinal separation cannot be applied. This ***will*** affect your ability to get certain altitudes or routes.

Flight Planning Requirements

- To inform ATC that they have obtained RNP4 or RNP10 authorization and are eligible for reduced lateral and/or longitudinal separation, operators shall:
  - (1) annotate ICAO Flight Plan Item 10 (Equipment) with the letter “R” and …
  - (2) annotate Item 18 (Other Information) with, as appropriate, “PBN/L1” for RNP4 or “PBN/A1” for RNP10. Multiple entries can be made in PBN/. There should be no space between letters and numbers. For example: PBN/A1B1D1L1O1S2
- It is also required that operators show their RNAV capability for domestic U.S. by filing:
  - (1) annotate ICAO Flight Plan Item 10 (Equipment) with the letter “Z” and …
  - (2) annotate Item 18 (Other Information) with, as appropriate, “NAV/”, then the domestic US alphanumeric sequence. For example: NAV/RNVD1E2A1
- Operators that have **not** obtained RNP 10 or RNP 4 authorization shall **not** annotate ICAO flight plan Item 18 (Other information) with “PBN/L1” or “PBN/A1” Care should be used to not overstate your capabilities when filing RNP/RNAV values in Item 18.

Flight Planning Requirements

- **Item 10a Equipment:**
  - "J5" J6" or "J7" is used to indicate Oceanic Data Link capability
  - If MNPS then "X" is required
  - If RNP4 or RNP10 then "R" is required and Item 18 must contain appropriate PBN/

Item 18 example: PBN/A1B1D1L1O1S2 NAV/RNVD1E2A1

ROUTE PLANNING IN THE NEW YORK CTA/FIR

Route Planning

- Unless filing via the OTS, operators may file via any user preferred routing while operating within the New York FIR, East OR West:

a) There is no requirement to file via a named fix along the Bermuda 180 DMA Radar volume. (exception for when the Radar is out of service, which would be NOTAM'ed in advance)

b) There is no requirement to file via an ATS route, either part or in whole, within the OCA West - operators may file point to point, or via latitude/longitudes.

Route Planning

There are, however, a few requirements for flight planning to exit the New York CTA/FIR:

- To Moncton ACC, file via:
  - M201 all the way to CARAC
  - M202 all the way to LOMPI
- U.S. Domestic Airspace- All aircraft exiting the New York Oceanic FIR into San Juan, Miami, Jacksonville, or New York Domestic *shall* file a route that exits over a five letter boundary fix due to coordination requirements.

Route Planning And Special Use Airspace

- Access through Special Use Airspace such as Warning Areas are handled dynamically by current agreement between FAA and the United States Navy. As such, aircraft operators will be provided shortened routings through these areas whenever they are released to FAA, but there are no current provisions that can allow aircraft operators to flight plan through the areas.

  exception: Holiday Airspace Release Program (HARP)

- Aircraft operators must file around all Special Use Airspace via designated airways. (e.g., AR8)

Airspace 101

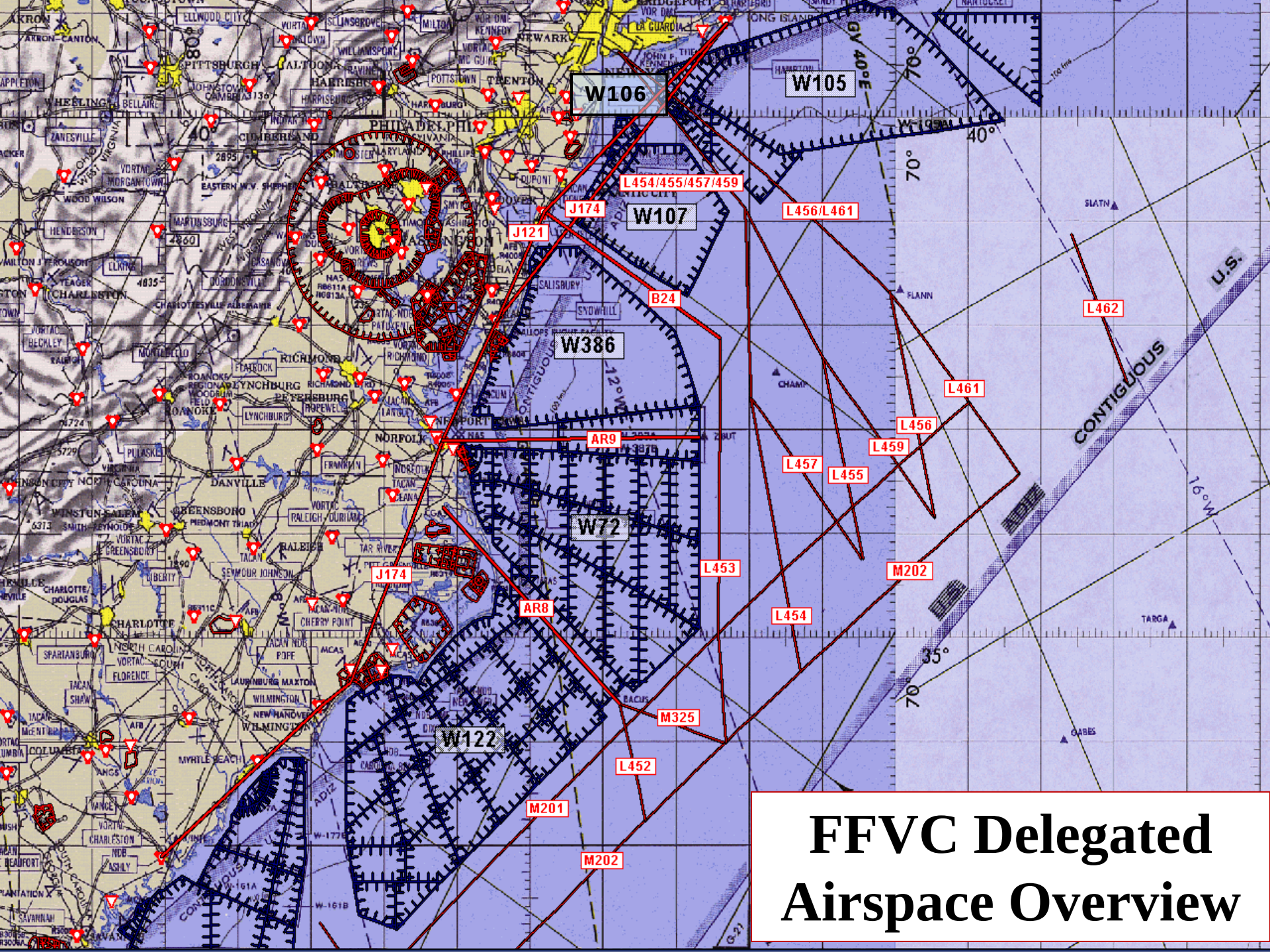
LCDR Joel “Cash” Castillo
Airspace Officer
Fleet Area Control and Surveillance Facility
Virginia Capes

Operations Work

Date: February 11-12, 2015

February 2015

Federal Aviation Administration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W122
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J174
J121
B24
AR9
AR8
L462
L461
L456
L459
L457
L455
L453
L454
M202
M325
L452
M201
M202
CONTIGUOUS U.S.
FFVC Delegated
Airspace Overview

DON Delegated Airspace

- **The primary purpose of the SUA program is to establish/designate airspace in the interest of National Defense, security, and/or welfare.**
- **The military has a continuing requirement to conduct operations, training, and testing activities within airspace as free from other aircraft as is practicable and has established programs and constructs to support this obligation.**

SUA Usage Policy

To fulfill military training, and test/evaluation requirements for peacetime, contingency, and wartime operations.

1. **The volume and times of use shall be the minimum required to contain the intended activity.**
2. **SUA is returned to the Controlling Agency during periods when it is not required for its designated military purpose.**
3. **Letters of Agreement between the Using Agency and Controlling Agency outline the SUA activation/deactivation procedures.**

Joint Use Policy

- **Under the "joint−use" concept, SUA is released to the controlling agency and becomes available for access by nonparticipating aircraft during periods when the airspace is not needed by the using agency for its designated purpose." The SUA is inactive during these periods.**
- **When SUA is inactive (or deactivated) it reverts back to the original class airspace.**
- **A letter of agreement codifying procedures by which the Controlling Agency may safely transit nonparticipating IFR aircraft through activated SUA shall be finalized prior to such operations.**
- **DON Using Agencies shall participate in the Joint Use of SUA to the maximum extent possible.**

Questions

Presented to: New York Oceanic Operations Work Group

Date: February 11-12, 2015

Federal Aviation Administration

Back-up

Naval Airspace and Air Traffic Control Standards and Evaluation Agency (NAATSEA)

- **The Director, NAATSEA, in collaboration CMC APX-8, provides overall management of DON responsibilities and activities associated with the administration and management of all airspace delegated by the FAA which includes:**
  - airspace architecture redesign
  - policies, procedures, processes
  - equipment redesign
  - guidance for safe, effective and efficient operation and administration of DON units handling airspace matters

NAVREPs & RACs

NAATSEA / HQMC AVN (APX)

USN NAVREPs
USMC NAVREP
MCI West
FACSFAC San Diego
R-2508/China Lake

FAA Western Service Area
(Seattle, WA)
Camp Pendleton

USN NAVREPs

FAA Central Service Area
(Fort Worth, TX)

USN NAVREPs
USMC NAVREP
MCI East
FACSFAC JAX
FACSFAC Vacapes

FAA Eastern Service Area
(Atlanta, GA)
Camp Lejeune

USN HQ NAVREP
USMC HQ LNO

FAA Headquarters
(Washington, DC)

New York Center Oceanic Clearance Procedures

Reference Material

- ICAO North Atlantic Document 007-

GUIDANCE CONCERNING AIR NAVIGATION IN AND ABOVE THE NORTH ATLANTIC MNPS AIRSPACE (2013 edition)

New York Center Oceanic Clearance Procedure Changes

On February 5, 2013, New York Center changed the methods by which Oceanic Clearances are issued for all aircraft entering the NAT directly from either New York Domestic or Oceanic airspace.

These changes have been incorporated and published in both the United States AIP and ICAO North Atlantic Document 007, chapter 5.6.

The following slides present background information and the reasons for the change.

What is an Oceanic Clearance?

- Section 5.1.1 of the ICAO North Atlantic Document 007 states “there are three elements to an Oceanic Clearance: route, Mach Number and flight level. These elements serve to provide for the three basic elements of separation: lateral, longitudinal and vertical”
- Section 5.1.2 of NAT Doc 007, states that “Oceanic Clearances are required for all flights in the NAT controlled airspace (at or above F55)”.
- Section 5.1.4 states that “Specific information on how to obtain oceanic clearance from each NAT OAC is published in State AIPs”

Note: Oceanic Clearances are not used any place in the world other than in the NAT.

Current NAT Operations

- Due to the large amount of crossing traffic situations in the New York OCA East, the strategy of issuing “coast-out to coast-in” conflict-free clearances is not always employed.
- Instead, air traffic control, especially at New York and Santa Maria is more of a tactical nature, similar to a domestic RADAR sector.
- As a result of these tactical operations, reroutes are often given to New York from adjacent ANSPs to be issued to aircraft operating outside the OTS while still within the New York FIR.
- These reroutes are sometimes “missed” by flight crews, thus resulting in errors, pilot deviations, and/or interventions by downstream ANSP’s.
- By limiting route clearances to times when changes are actually made to a cleared route, the intent is that the receipt of a route clearance from New York will carry greater significance.

Oceanic Clearance Issues

- Section 5.1.8 states “If any of the route, flight level or Mach Number in the clearance differs from that flight planned, requested or previously cleared, attention may be drawn to such changes when the clearance is delivered. Pilots should pay particular attention when the issued clearance differs from the Flight Plan. (N.B. a significant proportion of navigation errors investigated in the NAT involve an aircraft which has followed its Flight Plan rather than its differing clearance).
- Additionally, it is stated that “any subsequent change to any single element of the Oceanic Clearance does not alter the other elements”. This is true regardless of the delivery method.

How/Where clearances are issued

- Oceanic Clearances are provided two ways by New York ARTCC:

1. Via VHF/UHF in RADAR coverage prior to entering North Atlantic airspace. Due to the close proximity of the entry fixes into NAT airspace, all coordination has to be completed and all clearances issued in a very short amount of time
2. Via CPDLC or HF for aircraft which never enter RADAR coverage, normally for aircraft entering from the New York OCA West FIR.

Why the Change?

- Due to continuing safety concerns associated with the non-adherence to or incorrect execution of Oceanic Clearances and tactical reroutes, the Federal Aviation Administration evaluated its current method of issuing an Oceanic Clearance by New York ARTCC. This analysis identified several procedural changes that could be made to the method by which an Oceanic Clearance is issued in order to improve safety.
- These procedural changes will not eliminate the issuance of any portion of the Oceanic Clearance and will satisfy the requirements contained in Nat Doc 007, "*Guidance Concerning Air Navigation In and Above the North Atlantic MNPS Airspace*", Chapter 5, "*Oceanic ATC Clearances"*, edition 2013.

Why The Change (cont'd)

- Aircraft are not being pre-coordinated with all ANSP's to the oceanic exit point prior to the issuance of an Oceanic Clearance. The exit point is quite frequently changed by downstream ANSP's during coordination. This requires a tactical re-route.
- Flight crews frequently complained about "why are you issuing me a route that I already have?"
- A route clearance should be the exception and not the norm. This adds emphasis to the flight crew when they do receive a tactical airborne reroute, and subsequently result in fewer errors/interventions.
- FAA procedure is to use the route filed in the FPL to fulfill and issue the route element of the Oceanic Clearance.

Additional Analysis

- Position reports, which include intent (next and next+1), are used to ensure that aircraft are in compliance with the ATC expected route.
- All ANSP's have conformance monitoring software that will immediately alert control personnel that the reported route differs from the profiled or expected route. This will always protect against issues such a wrong route held by an FMS due to a duplicate flight plan or unprocessed CHG message.
- Deviations from the aircraft route vs. the ATC expected route can therefore be corrected long before an actual aircraft deviation occurs.

Additional Analysis

- Position reports, which include intent (next and next+1), are used to ensure that aircraft are in compliance with the ATC expected route.
- All ANSP's have conformance monitoring software that will immediately alert control personnel that the reported route differs from the profiled or expected route. This will always protect against issues such a wrong route held by an FMS due to a duplicate flight plan or unprocessed CHG message.
- Deviations from the aircraft route vs. the ATC expected route can therefore be corrected long before an actual aircraft deviation occurs.

Change Incorporated

- New York Center implemented new Oceanic Clearance Procedures on February 5, 2013. All of the changes were incorporated into both the United States AIP and NAT Doc 007 2013 edition.
- Chapter 5.6 in titled: Oceanic flights originating from the NAM, CAR, or SAM regions and entering NAT MNPS airspace via the New York OCA, and contains all of the relevant information
- No single element of the Oceanic clearance was eliminated.
- The change was only how the Routing portion of the OAC is considered to be satisfied and delivered. These changes are provided on the following slides.

NAT Doc 007 - Chapter 5.6.2

- There are three elements to an Oceanic Clearance; Complete Route, Flight and Mach number. These elements do not have to be issued in the same clearance. Additionally, these elements may not be issued by the same ATS Provider. For example, the Route portion may be issued by one ATC Unit, the Oceanic Altitude issued by another and finally the Mach Number by a third. The receipt of all three elements, even if not received at the same time, constitutes receipt of an Oceanic Clearance and no further request for one is necessary. The detail of the procedures followed may differ depending on the ICAO region from which the flight originates.

NAT Doc 007 – Chapter 5.6.3

- For aircraft planning to enter the NAT via the New York OCA from the NAM, CAR or SAM regions, the IFR clearance to destination received at the departure aerodrome from Air Traffic Control constitutes the Route portion of the Oceanic Clearance. Once airborne, and prior to entry into the NAT, aircraft will be assigned a Mach number and an Altitude by the FAA prior to NAT entry.

Note: For the purpose of this procedure," complete route" is defined as any route clearance with a clearance limit of the aircraft's destination. PDC clearances that contain three asterisks (***) indicate there is NO change to the filed flight plan route. Any changes to a filed flight plan shall be communicated as part of the PDC.

Other Considerations

- For those aircraft filed via the Organized Track System (OTS), ATC will obtain confirmation of the current OTS TMI number for that time period.
- Any changes to the route, altitude, or speed of a flight prior to or after entry into the NAT *shall* constitute the new Oceanic Clearance to be followed.

ATC Expectations/AC Requests

- At all times, aircraft are expected to maintain the route, altitude and speed last assigned by ATC.
- Requests to change one or more of these elements can be made at any time, whether in RADAR or non-RADAR airspace.
- These requests should not normally be made when a flight is within 45 minutes of the FIR boundary to avoid complications during the coordination process. (unless for weather related or emergency issues)
- At ANY time, a flight crew may request route confirmation from New York Center if so desired.
- ALL route profiles are transferred to downstream facilities through automated coordination processes. There is NO need to confirm route with a subsequent ANSP after exiting the New York OCA/FIR

Piarco FIR Traffic

- Aircraft originating from airports within the CAR/SAM region and *not* entering a United States offshore RADAR sector and through Piarco ACC will not be included in these changes at this time. Piarco will continue to use existing procedures for these aircraft.

Note: Piarco ACC recently implemented a new operating system that will allow development of AIDC automated transfer procedures between Piarco and New York. When this system becomes operational, aircraft entering the NAT directly from Piarco will be included with the new procedures.

Canadian FIR Traffic

- Aircraft originating from airports within the NAM region and not transiting through a United States offshore RADAR sector will not be included in these changes at this time.
- Aircraft that technically enter the NAT in New York Center airspace navigating Northeast bound via M201/202/203, then enter into Radar controlled airspace within either Moncton/Gander ACC, *will* receive a new clearance prior to re-entering the NAT through the GOTA.

Questions?

NAT Planning And The Organized Track System (OTS)

NAT Planning Process

NAT Document 007, Chapter 2, contains all of the details regarding the processes that occur in building the OTS daily. As a reminder, Gander ACC is responsible for publishing the Eastbound OTS, and Shanwick ACC is responsible for publishing the Westbound OTS.

The development of the OTS occurs twice daily, with telephone collaboration taking place between Shanwick, Gander, New York, and Santa Maria Centers during the following times:

1130-1200 Zulu (1 hour earlier DST) for Eastbound preparation

1900-1930 Zulu (1 hour earlier DST) for Westbound preparation

NAT Planning Process

New York Center relies upon two main sources of information to use during the OTS planning process:

1. Dynamic Oceanic Track System (DOTS+) Computer program – This system examines upper wind forecasts and plots Minimum Time Tracks (MTT) between major city pairs based on entered aircraft types.
2. Preferred Route Messages (PRM) – Information received from airline AOC's that indicate major city pair routings they will file between CONUS and Europe. PRM data generally is considered before consulting the DOTS information, because airlines might prefer routes that differ from a simple minimum time component. The other ANSP's also use PRM data, so it is very important that airline AOC's send us this data to assist in the planning process.

NAT Planning Process

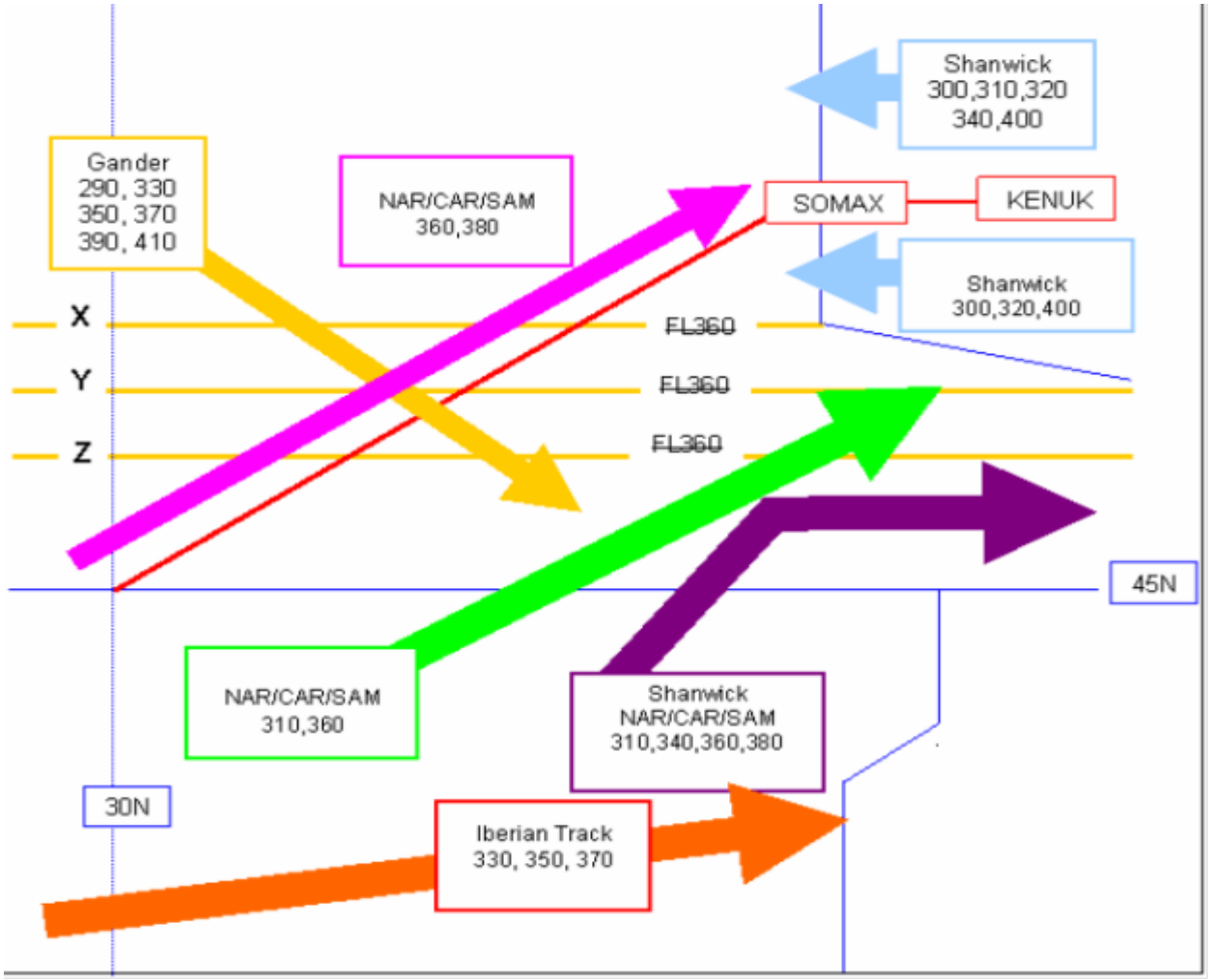
Altitude allocations on each track are made in accordance with NAT DOC 007, Chapter 2. However, there are two exceptions to this:

1. Tracks that are destined for the Iberian Peninsula.

2. Tracks that serve aircraft originate primarily from the CAR/SAM ICAO region, or New York OCA West.

On these tracks, altitudes are governed by the Flight Level Allocation Scheme, which can be found in Attachment 6 of Nat DOC 007.

Flight Level Allocation Scheme (FLAS)



NAT Planning Process – Iberian Tracks

New York Center will request that an Iberian Peninsula Track be published whenever there is a moderate or greater demand on Tracks already planned over DOVEY, JOBOC, or both. When this occurs, an Iberian Peninsula track will be built that originates south over SLATN in an effort to ease the flow burden over the other two fixes, and ensure maximum altitude availability for more heavily requested tracks. Depending on the expected volume over this track, two or three altitudes will normally be requested in accordance with the FLAS.

NAT Planning Process – CAR/SAM Tracks

Depending on the jet stream, there will be one or two tracks that might be published that serve departure airports from southeast United States, western Caribbean, and Mexico. There has been a marked increase in the amount of aircraft that normally will file on these tracks – more than can be served by the altitudes that we are delegated through the FLAS. This is especially true if aircraft from Atlanta are included in this flow. Normally, we are only allocated four flight levels on these tracks, normally anchored at SOORY and MUNEY, and they have to be *published* at different levels than a crossing Iberian track.

However, be advised that you may receive an altitude assignment based entirely on the dynamic traffic situation that places you at a flight level "reserved" on another track. This is completely normal, and you can be assured that the ATOP system will provide separation at all times from all other aircraft.

Flight Planning From the Eastern Caribbean

All aircraft that originate from Eastern Caribbean airports should *always* file for whatever altitude is optimal for the flight. It does not matter if the flight plan will cross an Iberian peninsula track, or join a SOORY track at the Oceanic exit fix. New York Center will always approve altitude assignments based on existing traffic, and not traffic you may or may not interact with 3 or 4 hours in the future. If the flight exits New York via Santa Maria ACC, very few profile changes should be encountered, since the operating systems of ZNY and LPAZ are similar in design, and allows for more seamless transfer at the boundary.

However, depending on the winds, aircraft that exit New York north of 42 North latitude and enter Gander or Shanwick airspace, will have a far greater chance of interacting with the main bulk of the eastbound flow. Because both Gander and Shanwick must protect all aircraft profiles through to the oceanic exit fix, profile change requests are often issued to New York during the coordination process. These may be for route, altitude, or both.

NAT Track Advisory Message

Dynamic Airborne Reroute Procedures (DARP)

DARP

- Service provided on a daily basis for CPDLC and ADS-C connected aircraft.
- Route changes provided upon request from the flight deck and fulfilled based on current traffic situation and adjacent facility coordination agreements.
- Reroute requests normally received via Downlink Message (DM) 24, and must either tie into the original route or provide an entire new route to destination.
- Route changes that include latitude/longitudes must be sent in standard format (xxxxN/xxxxxW)
- Standard route clearance messages (UM) 76/77/79/80/83 will be used to send the clearance, depending on the extent of the change.

DARP Actual Example

DARP Test 01 May 2014 (Hemingway Version)

- Flight airborne in oceanic airspace
- AOC used latest wind/temperature and actual aircraft weight data "re-optimized" the flight plan, advised flight crew and uplinked "new" route information to FMC RTE 2.
- Flight crew made CPDLC Route Request RTE 2 to ATSU
- After appropriate coordination and conflict probe, ATSU uplinked route clearance (UM 80 or UM 83)*
- AOC notified..."NEW ROUTE APPROVED"
- Flight Planning System updated, new flight plan sent to printer, and new weather and divert information auto uplinked

*First route uplink from Santa Maria was UM 83 AT [position] CLEARED [route clearance]. Second route uplink from New York was UM 80 CLEARED [route clearance].

DARP XXXXXXXXX 01 May 2014 Flight Plan Review

Oceanic Routing	Time	Destination ETA	Destination Fuel
Original Flight Plan 43N050W...41N060W...JOBOC...LARGE...ZIBUT	2.39	1846Z	17.8
1st Re-Optimization 43N050W...42N060W...38N070W...ZIBUT	2.38	1844Z	17.8
2nd Re-Optimization 43N050W...40N060W...OVAPI...TILED...ZIBUT	2.35	1840Z	19.0

1200# of fuel saved...arrival time improved by 6 minutes

Current NAT Initiatives

- NAT Datalink Mandate – Phase 2a
  - In effect on 5 February 2015
  - Affects NAT OTS FL350-390 Inclusive
    - Requires FANS 1/A CPDLC and ADS-C capability
  - FAA is not mandating in ZNY East OCA
- Potential R-Long Operational Trials between New York and Gander Centers
  - Current 5 minute longitudinal separation trial between Gander and Shanwick
    - Equates to about 40NM
  - Automation adaptations needed to allow trial between Gander and ZNY
    - Gander and Shanwick trial requires GNSS. Aircraft would need to be FANS 1/A, RNP-4 equipped/certified for ZNY to accept
- Santa Maria ACC Reduced Separation Standards and Cross-Boundary Seamless operations with New York Center
  - Santa Maria accepts 50 NM lateral
  - Scheduled for 30 NM lateral and 30 NM longitudinal and 50 NM longitudinal CY2015

Current NAT Initiatives

- RLat Operational Trials and ½ degree Tracks
  - Scheduled to begin November 2015
  - ½ degree tracks will not start or enter ZNY airspace
- Transition from MNPS to PBN or “High Level” Airspace
- Future Procedures Harmonization For the Delivery of CPDLC Route Clearances in the NAT
- NAT Doc 7030 6.1.1.7 Proposal for Amendment (PfA) for mandatory speed assignment
- FAA NAT Resource Guide- http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs470/media/NAT.pdf

WATRS/Caribbean Initiatives

WATRS/Caribbean Initiatives

In, January, 2014, a Tri-Lateral meeting was held between New York, Santa Maria, and Piarco Centers to enter into discussion on how to better facilitate traffic flows that affect these three facilities.

Piarco ACC gave a presentation on their new automated ATC platform, built by Selex, that they indicated would allow them to modernize their procedures into and out of Western Caribbean airports. Additionally, their new system would also allow New York, Piarco, and Santa Maria to develop Automated Interfacility Data Transfer (AIDC) connectivity and procedures for seamless aircraft transfer across boundary lines.

WATRS/Caribbean Initiatives

The first step in modernizing procedures began last year with the integration of various Island Radars into the Piarco system. This has allowed their facility to have surveillance coverage that extends North of 18N into ZNY Oceanic between 61W and 5730W (approximate)

On March 5th, 2015, new fixes will be implemented along 18N from 61W and east to 55W. As of March 5th, aircraft operators should file for one of the new fix names as published. The list of fixes and the associated lat/longs are:

18/61 – AMMTO 18/58 – DRDGE 18/55 - GLAAS
18/60 – BNJEE 18/57 – ELJEZ
18/59 – CITRS 18/56 – FISST

WATRS/Caribbean Initiatives

Once these new fixes are in place, Piarco has indicated plans to develop arrival and departure procedures into the various airports that will facilitate the following changes in the procedures for aircraft transfer:

- Aircraft may transfer with one degree of separation entering the radar volume of airspace; (currently two degrees required)
- Aircraft may be transferred at any altitude regardless of direction of flight. This will result in far fewer altitude profile changes and reroutes to accommodate those changes as aircraft approach 18N.
- Airway or route structure from the 18N fixes for departure and arrival procedures.
- Aircraft landing Antigua will not have to descend as early as current procedures require.

WATRS/Caribbean Initiatives

With the integration of the Freeport, Bahamas Radar into the Miami ARTCC, work can now commence to develop, procedures that will allow New York and Miami ARTCC to transfer aircraft bi-directionally across the common boundary using reduced 30/30/D50 separation standards.

This will result in far fewer profile changes for aircraft and the ability to maintain optimal altitudes into airports served by ZMA. Northeast bound, this will also allow for optimal altitude assignments for a longer duration while in New York Oceanic airspace

Note: As a reminder, ADS-C and CPDLC equipage are requirements to be qualified for reduced separation of this type.

Planned ATOP System Enhancements

Future ATOP System Enhancements

There are many ATOP system enhancements that are planned for the near term (1-5 years) that will provide both a more seamless operation internally through ZNY Oceanic as well as provide aircraft operators even more ability to achieve more optimized route and altitude profiles.

Future ATOP System Enhancements

Enhancements in the ATOP system will allow for the full integration of the Bermuda sector radar volume to be incorporated into the ATOP system, instead of the traditional domestic platform. When this occurs, the immediate benefit for aircraft operators will be that there will no longer be any CPDLC disconnect messages through the airspace that currently occurs. Frequency change information will still take place for both HF and datalink aircraft.

Radar controller will have conflict probe “look-ahead” into non-radar airspace to strategically plan altitude assignments to achieve maximum efficiency.

Enhanced radar and frequency coverage will allow New York Center to possibly expand the current definition of the Bermuda airspace volume, and provide surveillance and frequency coverage for a portion of airways (L456/M204) that do not currently exist.

Future ATOP System Enhancements

- ADS-C Climb/Descent Procedure (ADS-C CDP)
  - Successful use during operational trials at Oakland ARTCC from 2011-2013
  - Allows for climb or descent through a blocking aircraft when less than standard longitudinal separation exists
    - Separation assurance remains with ATC
  - During trial, controllers had to use a manual checklist to use procedure
    - Cumbersome and time/resource intensive
  - Automated procedure for ATOP being developed
    - Release to facilities in 1st Quarter 2016
    - Available for use in mid-2016
  - Procedure on track for publication as a global standard in November 2016

Future ATOP System Enhancements

- ADS-B In-Trail Procedure (ADS-B ITP)
  - Similar to ADS-C CDP
    - Aircraft have less than required separation minima
  - Requires requesting aircraft to have ADS-B In and Out capability
  - Controller ensures that there are no other conflicts
  - Clearance is issued- responsibility for separation during climb/descent is with the flight crew
  - Procedure is being automated for ATOP
    - Available to facilities in January 2016
    - Expected to be available for use in June 2016

Airline/Aircraft Operator Concerns

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