Charting Oceanic Future through Performance Based Decision Making

Federal Aviation Administration

National Airspace System Performance Workshop

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Agenda

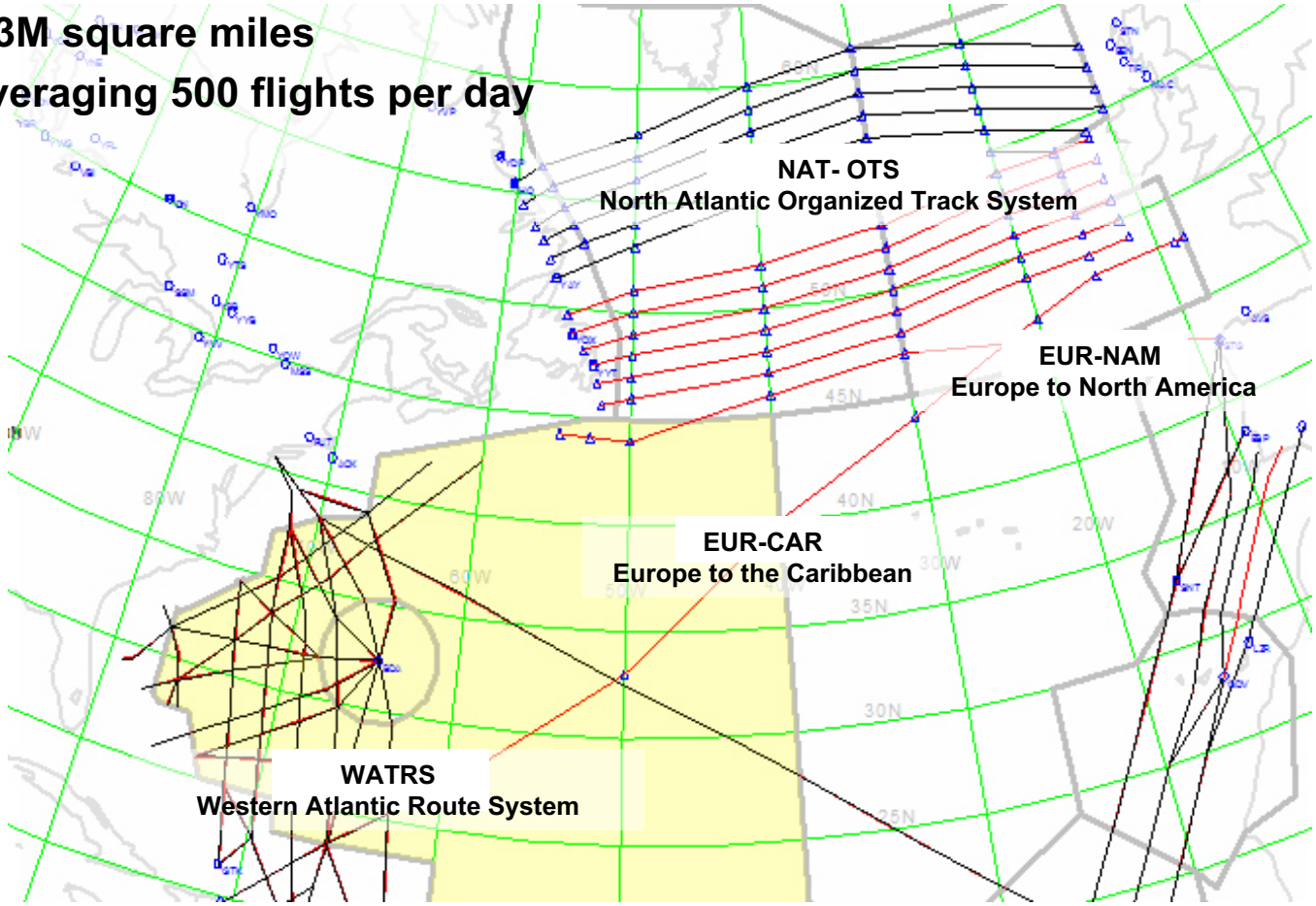
- Overview of Oceanic Airspace
- New Air Traffic System, Ocean21
- Background on Oceanic Metrics
- Metric Changes post-Ocean21
- Challenges of Measuring Oceanic Performance
- Future Metrics

Atlantic Operations

4 main traffic flows affect US Atlantic oceanic operations:

Controlled from New York Center (ZNY)

- **3.3M square miles**
- **Averaging 500 flights per day**

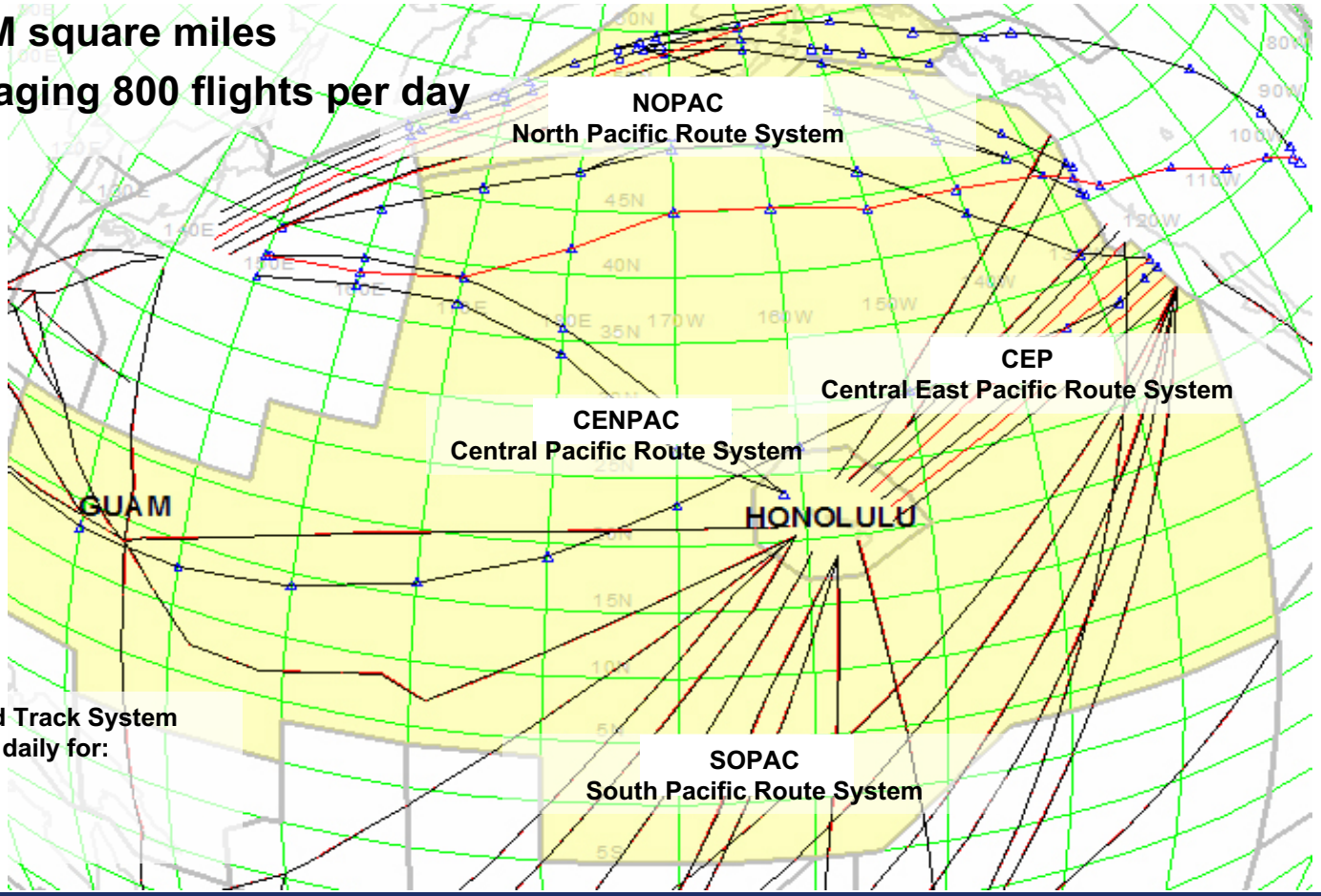


Pacific Operations

6 main traffic flows affect US Pacific oceanic operations:

Controlled from Oakland (ZOA) and Anchorage (ZAN)

- **21.3M square miles**
- **Averaging 800 flights per day**



PACOTS: Pacific Organized Track System
Flex tracks generated twice daily for:

- **NOPAC**
- **CENPAC**
- **SOPAC**

Advanced Technologies & Oceanic Procedures

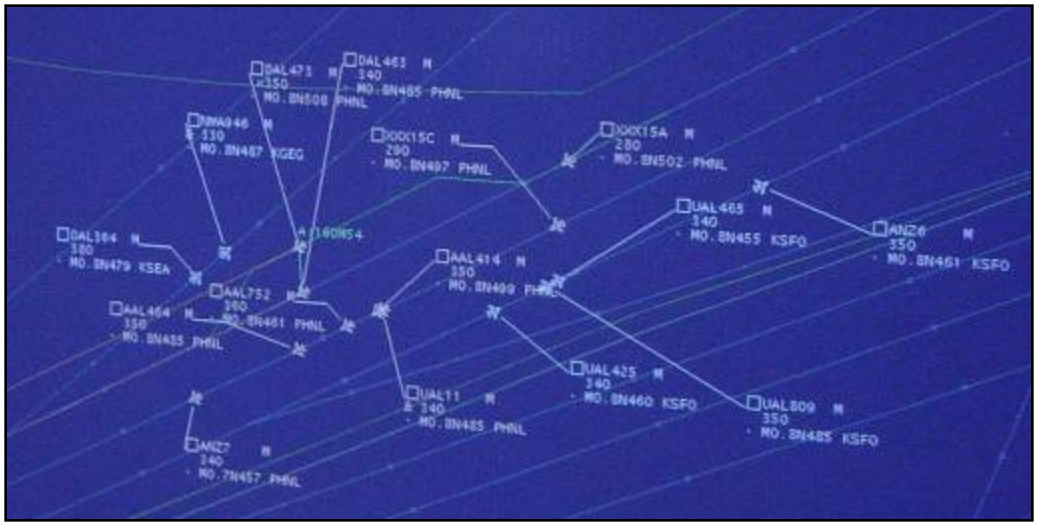
Ocean21, also known as ATOP, is a single, satellite based, integrated oceanic system for all three oceanic air traffic control centers combining common procedures, training, maintenance and support.

- **Fully integrates flight and surveillance data processing**
- **Enhance Conflict Probe to detect conflicts between aircraft**
- **Provides CPDLC, AIDC, and ADS surveillance capabilities**
- **Automates the manual processes used today**

Communications with ATOP

Reduction in HF communications

Electronic flight strips



Position reporting with ATOP

ATOP Site Status

Oakland Center

- Began daily operational use in June 2004
- Achieved full 24/7 transition in October 2005

New York Center

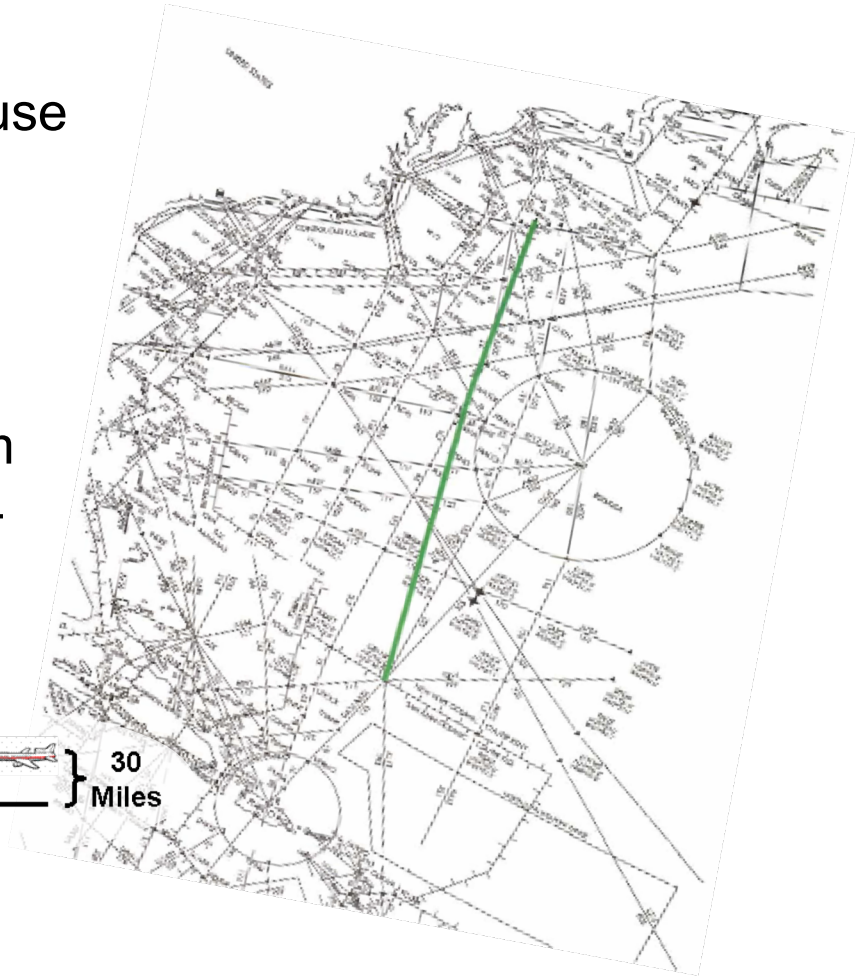
- Began initial live operations in March 2005
- Achieved full 24/7 transition in June 2005

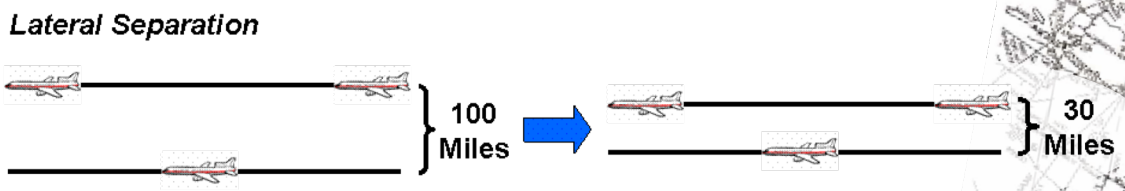
Anchorage Center

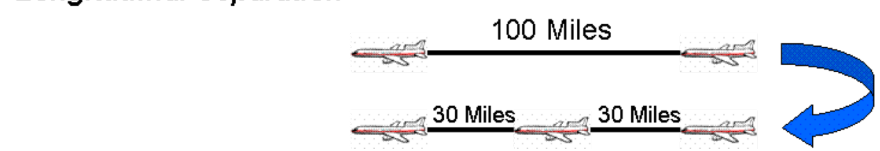
- Initial Operational Capability on March 15, 2006!

Realizing the Benefits to the Customer

- ATOP automation has allowed for the use of new and efficient fuel routes from South America to New York.
- Aircraft separation in the South Pacific was reduced from 100 nautical miles lateral/10 minutes longitudinal to 30 nm lateral/30 nm longitudinal (equates to 4 minutes)







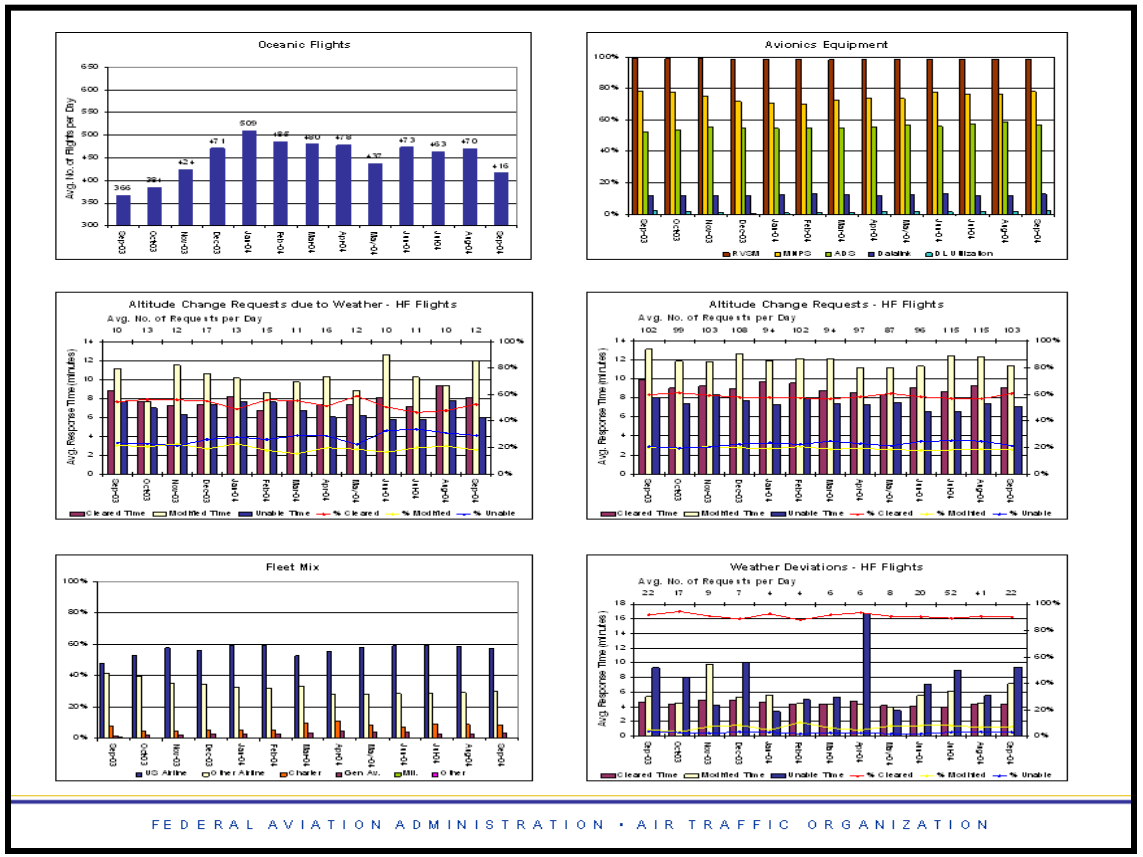
Background of Oceanic Metrics

- **1993 Government Performance and Results Act (GPRA)**
  - **Required federal agencies to measure performance and effectiveness**
- **1999 Initial Meetings with Oceanic Centers & Air Carriers**
  - **Discussed data sources and collection process**
  - **Received an overview of air carrier operations**
  - **Identified air carrier priorities in metrics (e.g., entry altitude and changes)**
- **2000 Initial Metrics Defined**
  - **Consolidated and compared lists of air carrier priorities**
  - **Evaluated available data**
    - **Primary data source: Oceanic Display and Planning System (ODAPS)**
    - **Other data sources: Oceanic Data Link (ODL) and Track Advisory (TA)**
  - **Started data collection and development of robust programs to process and analyze data**

Dashboard

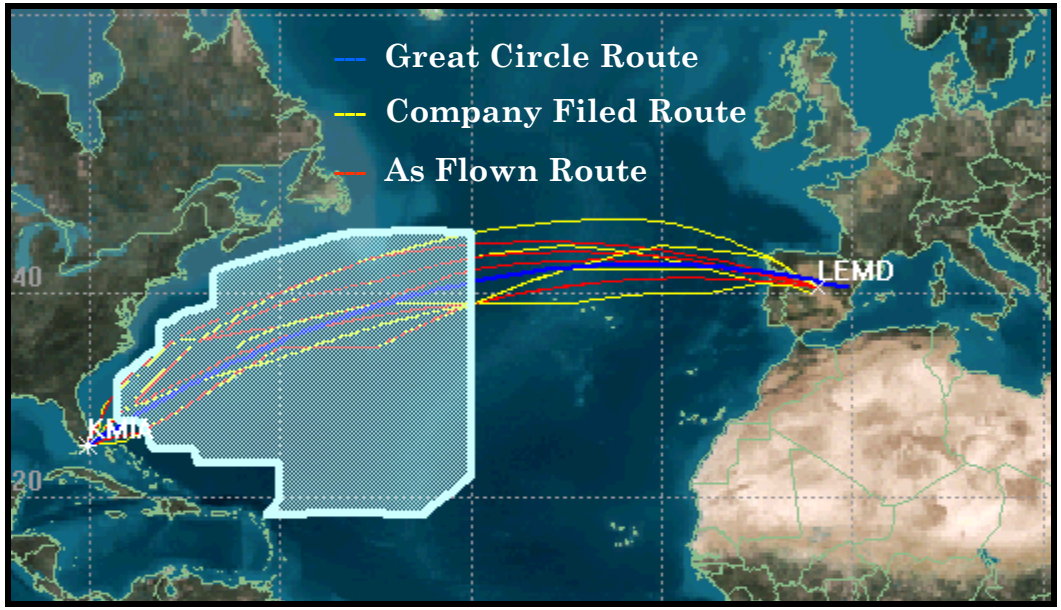
- **Established baseline metrics, referred to as Dashboard**
  - **Required to later determine affect of airspace and automation changes**
  - **Helped in monitoring trend in oceanic service and identify anomalies**

Flight Count
Fleet Mix
Avionics Equipage
Entry Altitude
Altitude Changes
Weather Deviations
ATC Response Time



Background of Oceanic Metrics

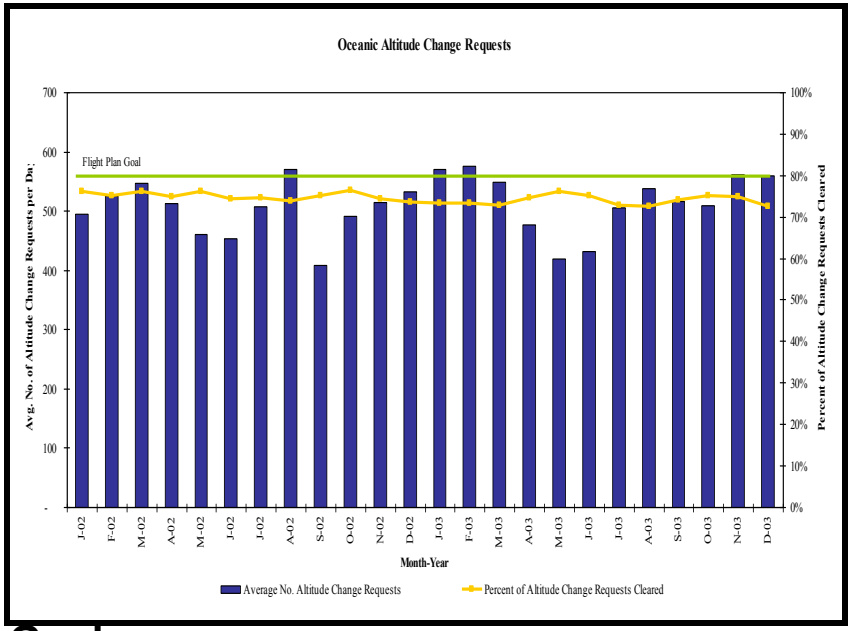
- 2001 FAA moves towards Performance Based Organization
- 2002 Initial meeting with Ocean21 (ATOP) Developer
  - Discussed data collection efforts
- 2003 Revisit with Air Carriers
  - Reviewed how air carrier priorities had changed
  - Discussed new performance measures (e.g., filed versus flown fuel burn)
  - Performed one week analysis for an air carrier



Background of Oceanic Metrics

- **2004 Air Traffic Organization (ATO) Established**
  - **FAA Administrators Flight Plan**
    - **Selected Oceanic metric: % Altitude Change Requests Granted**
    - **Measures number of pilot initiated requests for a change in altitude, generally a climb, that were cleared by Oceanic ATC.**

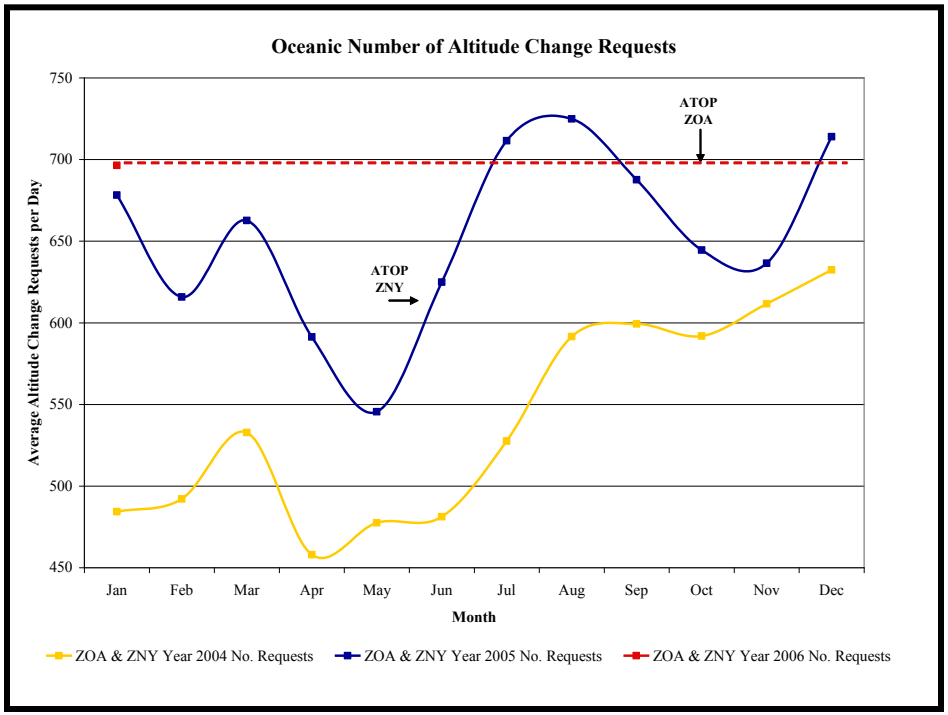
- **2005 Flight Plan**
  - **Discovered problems with the metric selected**
    - **Demand increased**
    - **Resulting in lower % and appearing to not improve service**
    - **However, clearing more requests than baseline performance**
    - **Still reached our 2005 Flight Plan Goal**



Oceanic Metric Trends Post ATOP

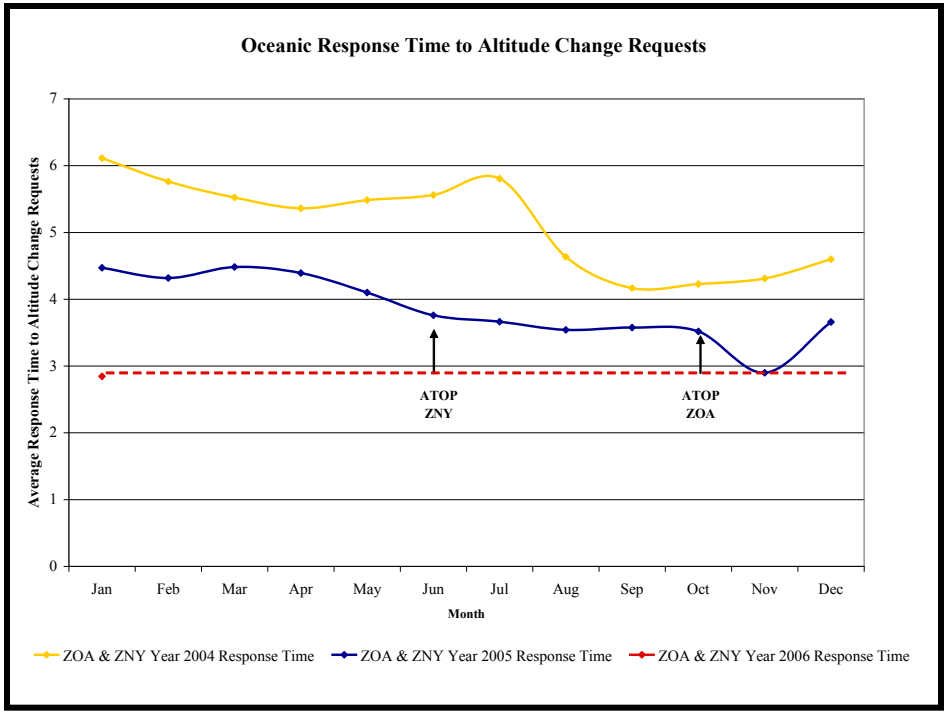
- The pilot demand for ATC service, number of altitude change requests ATC is handling, **increased by 24%** from pre-ATOP demand figures.

- Of this demand, the number of granted or cleared altitude change requests by ATC has **increased by 20%** from pre-ATOP granted figures.



Oceanic Metric Trends Post ATOP

- The average ATC response time to all altitude change requests has **decreased by 30%** from pre-ATOP response times.



Overcoming Oceanic Metric Challenges

- **Oceanic data sources are limited, very little end-to-end data available**
- **Oceanic data format is not standardized**
  - **Messages contain free text of communications (e.g., REQUEST versus RQST)**
  - **Required development of robust program to catch key phrases and variations**
  - **Changes in phraseology (e.g., Climb versus Cleared)**
  - **Validation of all data points required to avoid including data points with typos**
- **Oceanic positional data is infrequent**
  - **1 missing point could be 25% of flight data**
- **Oceanic metrics are impacted by other centers, US and International**
  - Data sharing with airlines and international airspace
- **Variations in operations and priorities across different geographic sub-regions**

Future Metrics

- **Official Metric**
  - **FY06 Flight Plan Goal: Develop oceanic capacity metrics and targets for FY07 and the out-years through the use of a comprehensive ATOP data collection and analysis capability and oceanic simulation and modeling capability**

- **Currently developing oceanic simulation and modeling capability for analysis and reporting of metrics**
  - **fuel consumption**
  - **% of flight at preferred altitude**
  - **Pre-ATOP altitude flown versus Post-ATOP altitude flown**
  - **Average distance surrounding flights because of the reduction of separation standards**
  - **Under utilized optimal altitude changes**
  - **Number of conflict per aircraft/route**
  - **AIDC usage – Average coordination time for AIDC**

- **In addition, meeting with users, facilities, and other oceanic service providers to discuss future metrics**
  - Oceanic Annual Report – An overview of what the Oceanic and Offshore Directorate has accomplished and metrics to support the success of the Directorate.

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Federal Aviation Administration

Backup Slides

Background of Oceanic Metrics

- **Target based on 2002 and 2003 performance**
  - Averaged past performance resulted in 74.4% attitude change requests cleared
  - Target set for 2010 at 80% since expected more requests cleared with Ocean21
  - Target set for 2005 at 75% since Ocean21 to be at ZNY for 8 months and ZOA for 6 months of 2005