

**Twenty Fourth Meeting of the
Informal South Pacific ATS Co-ordinating Group (ISPACG/24)**

**FANS Interoperability Team Meeting (FIT/17)
Brisbane, Australia, 9-10 March 2010**

Agenda Item 7: ANSP monitoring

**OBSERVED DATA LINK PERFORMANCE THROUGH COMMUNICATION
MEDIA TRANSITIONS IN THE OAKLAND FLIGHT
INFORMATION REGION (FIR)**

Presented by the Federal Aviation Administration

SUMMARY

This paper provides observed data link performance measures as specified in the Global Operational Data Link Document (GOLD) from the operational data collected in Oakland Oceanic airspace. This paper investigates the CPDLC performance from messages observed during communication media transitions in the Oakland FIR.

1. INTRODUCTION

- 1.1 This paper provides observed performance of messages during periods of communication media transitions in the Oakland FIR. In these cases, the CPDLC message was initiated through a different medium than the WILCO/Unable response was received. The purpose of this paper is to present the observed communication performance during periods of media transition.
- 1.2 The performance data observed from the Controller Pilot Data Link Communication (CPDLC) systems are measured against the Required Communication Performance (RCP) 240 specification to demonstrate that safety objectives which rely on the communications infrastructure can be met by the aircraft and ground systems. The sample period of 1 August 2009 through 31 January 2010 was examined in this paper.
- 1.3 There are six possible media transition states for the CPDLC messages: satellite to VHF, VHF to satellite, satellite to HF, HF to satellite, HF to VHF, and VHF to HF. These six cases are examined in this paper.

2. DISCUSSION

- 2.1 As described in the GOLD, this analysis uses the measurement of transit and response times to those CPDLC uplinks that receive a single Will Comply (WILCO) and/or an Unable response. These messages are considered to be intervention messages critical to the communications used when applying reduced separation standards. Other

message types, such as free text queries or information requests, are not included in the analysis because the corresponding longer response time from the flight deck would skew the results. All messages with a WILCO and/or Unable response attribute are assessed. These include communications transfer messages in addition to the typical intervention messages such as climb clearances.

2.2 Observed Performance from Transitions from Satellite to VHF Data Link

2.2.1 Figure 1 presents the ACP measures for messages initiated through satellite data link and responded through VHF data link during the collection period from August 2009 to January 2010. The numbers of CPDLC messages included in the analysis are shown in the legend of Figure 1; there were 268 total messages of this type during the six month period. The line representing the aggregate performance does not meet either the 95 or 99.9 percent performance criteria. The additional data provided represent observed performance by operator; however the number of satellite to VHF data link messages was relatively small. The operator identification in Figure 1 is desensitized.

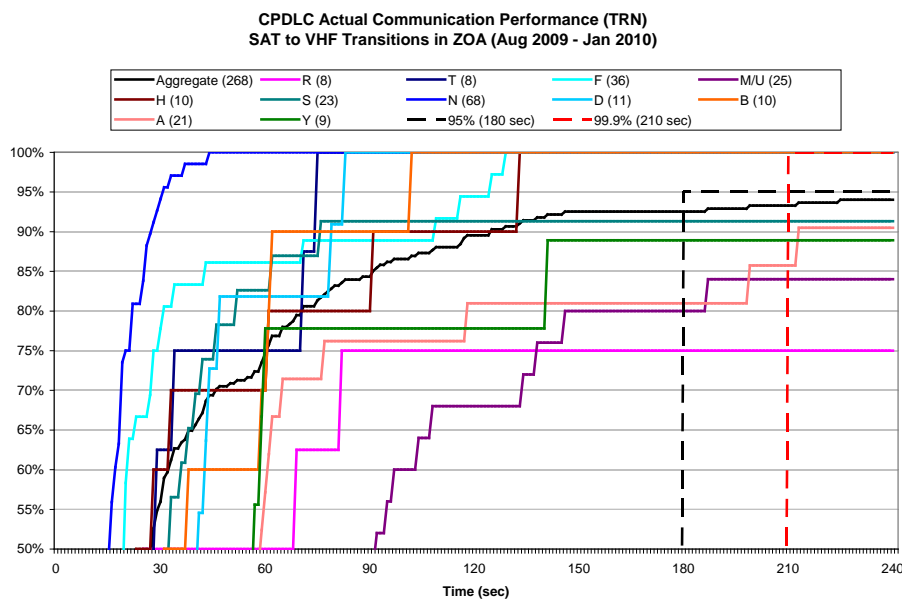


Figure 1. ACP – Satellite to VHF Transitions in Oakland Oceanic Airspace by Operator

2.2.2 Figures 3 and 4 presents the ACTP and PORT measurements, respectively, for satellite to VHF transition messages during the collection period from August 2009 to January 2010. Again, the numbers of CPDLC messages of this type are relatively small. The aggregate performance for the ACTP, shown in Figure 2, meets the 95 percent criteria.

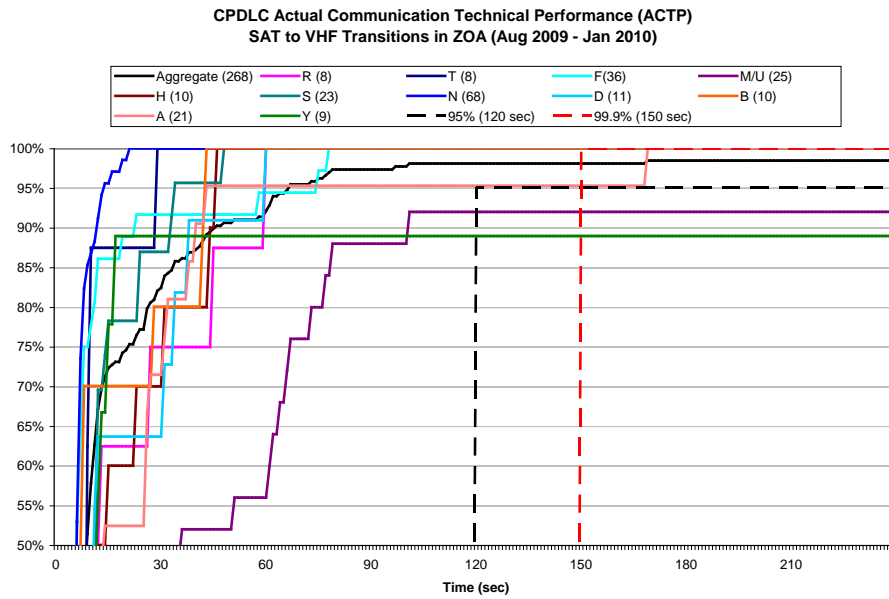


Figure 2. ACTP -- Satellite to VHF Transitions in Oakland Oceanic Airspace by Operator

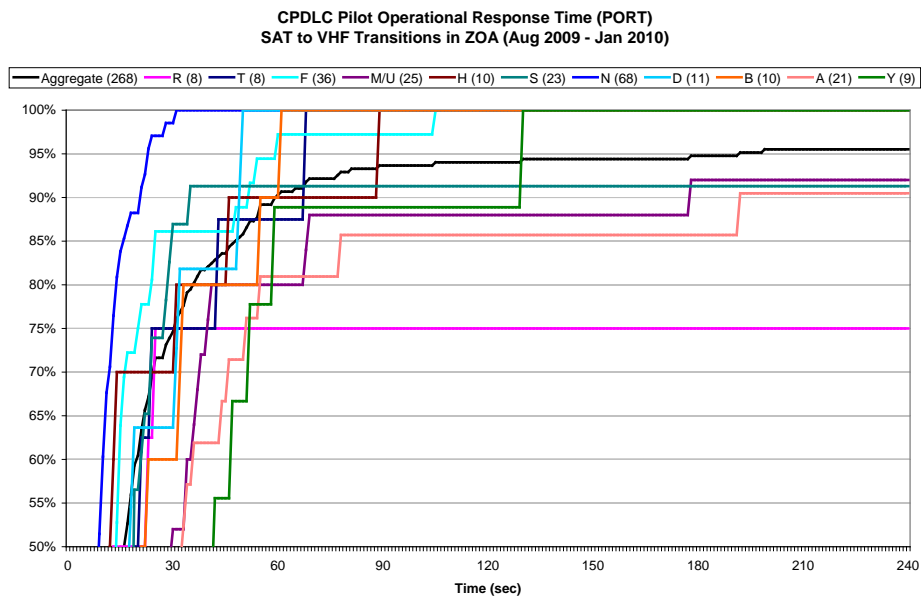


Figure 3. PORT – Satellite to VHF Transitions in Oakland Oceanic Airspace by Operator

2.3 Observed Performance from Transitions from VHF to Satellite

2.3.1 Figures 4 through 6 present the ACP, ACTP and PORT performance for messages transitions from VHF to satellite. The numbers of messages observed during each month are shown in the legend key of each figure. There were 127 total messages of this type. The aggregate performance meets the 95 percent criteria for the ACTP shown in Figure 5.

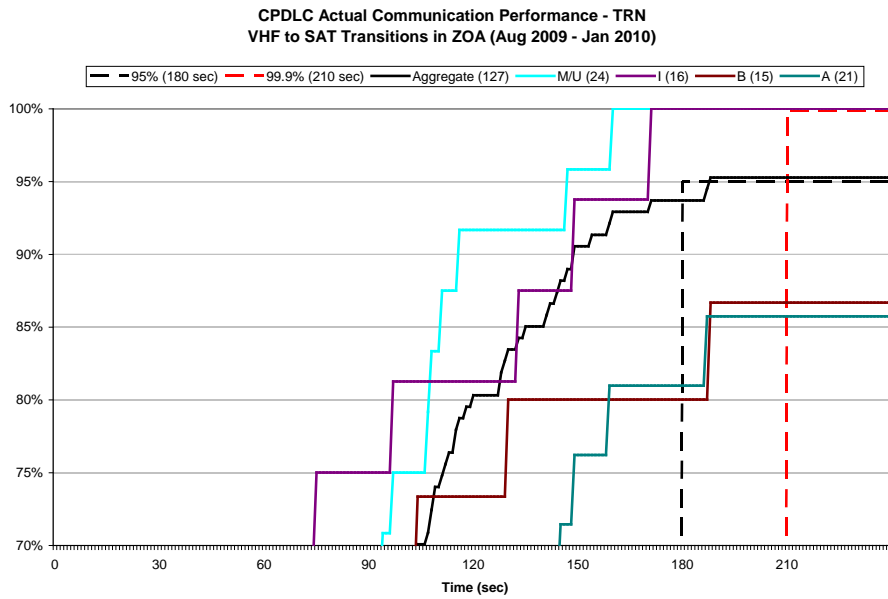


Figure 4. ACP - VHF to Satellite Transitions in Oakland Oceanic Airspace by Operator

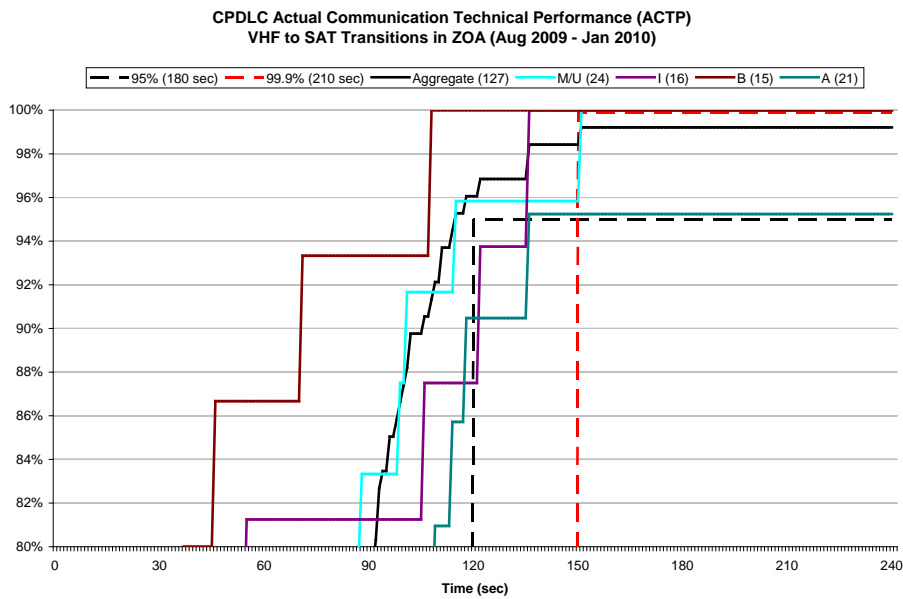


Figure 5. ACTP - VHF to Satellite Transitions in Oakland Oceanic Airspace by Operator

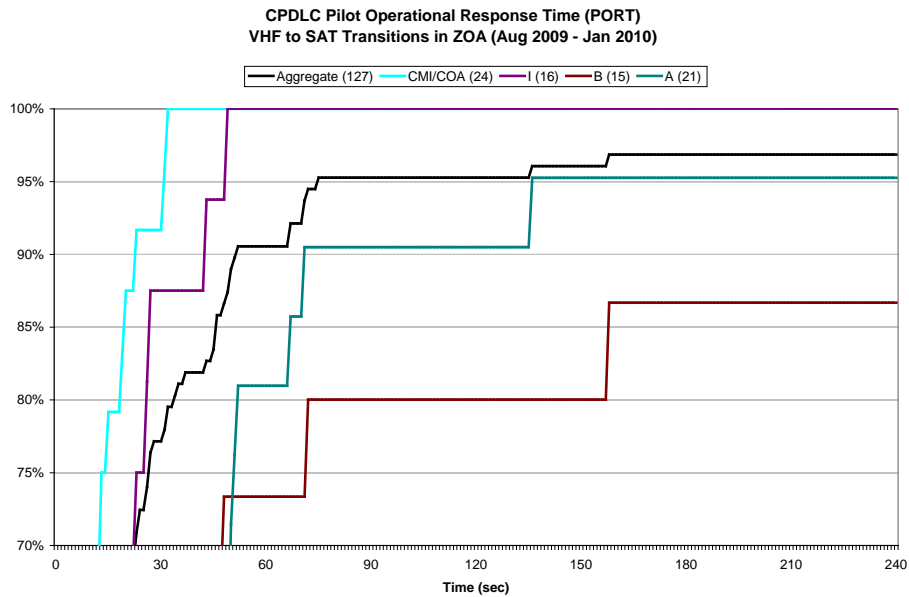


Figure 6. PORT - VHF to Satellite Transitions in Oakland Oceanic Airspace by Operator

2.4 Observed Performance from Transitions from Satellite to HF

2.4.1 Figures 7 through 9 present the ACP, ACTP and PORT performance for messages transitions from satellite to HF. The numbers of messages observed during each month are shown in the legend key of each figure. There were 108 total messages of this type observed during the six month period. The aggregate performance for the ACP and ACTP does not meet the 95 or 99.9 percent criteria for these messages.

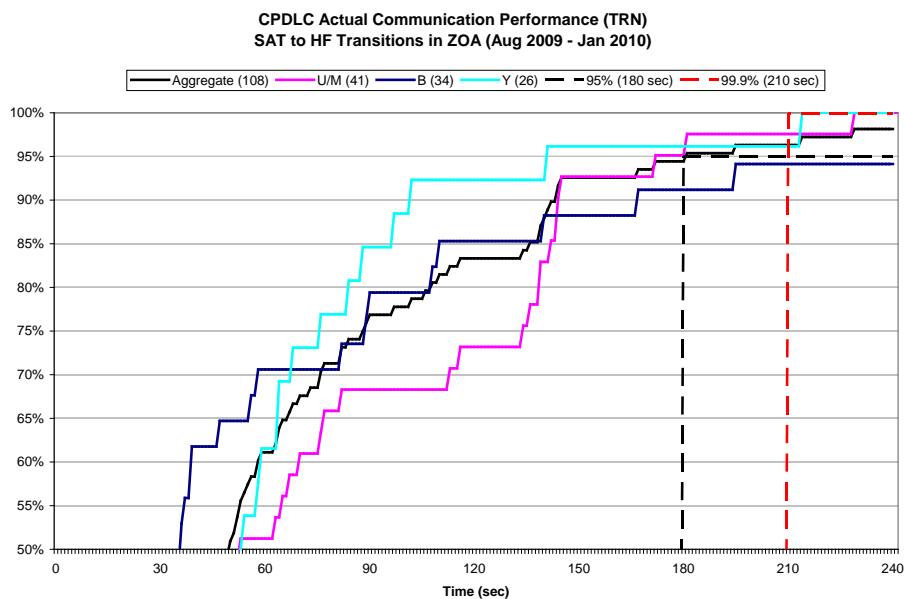


Figure 7. ACP – Satellite to HF Transitions in Oakland Oceanic Airspace by Operator

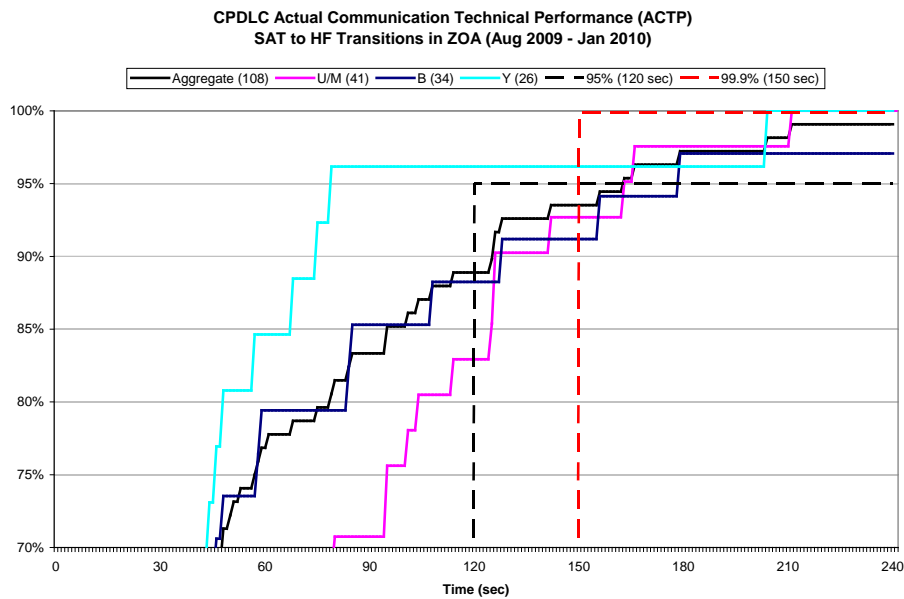


Figure 8. ACTP – Satellite to HF Transitions in Oakland Oceanic Airspace by Operator

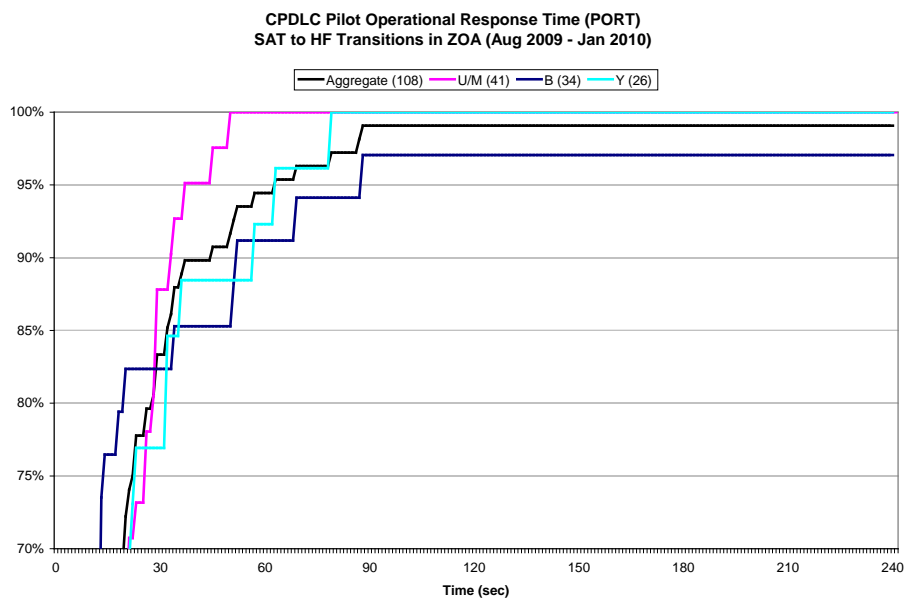


Figure 9. PORT - Satellite to HF Transitions in Oakland Oceanic Airspace by Operator

2.5 Observed Performance from Transitions from HF to Satellite

2.5.1 Figures 10 through 12 present the ACP, ACTP and PORT performance for messages transitions from HF to satellite data link. The numbers of messages observed during each month are shown in the legend key of each figure. There were 44 total messages of this type observed during the six month period. The aggregate performance for the ACP and ACTP meets the 95 and 99.9 percent criteria for messages of this type.

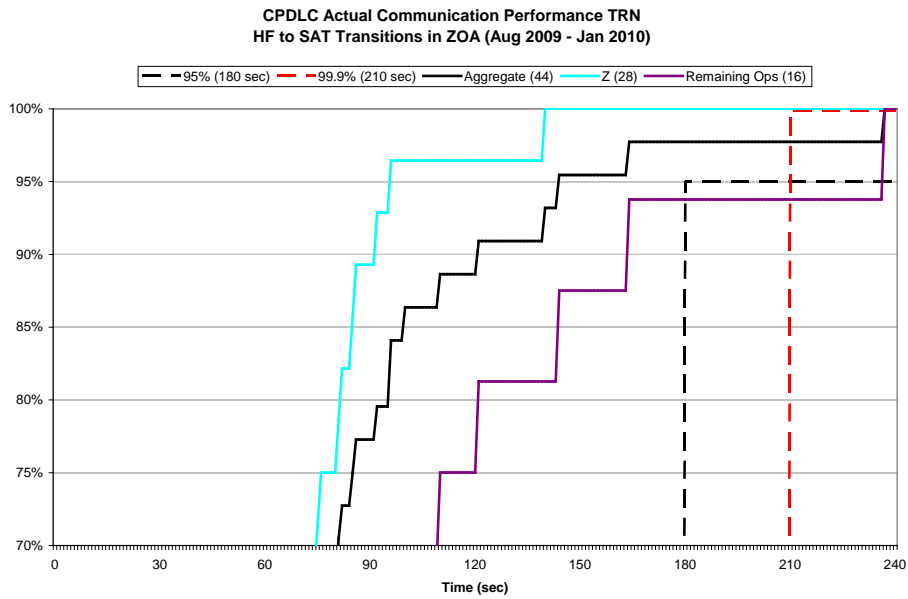


Figure 10. ACP – HF to Satellite Transitions in Oakland Oceanic Airspace by Operator

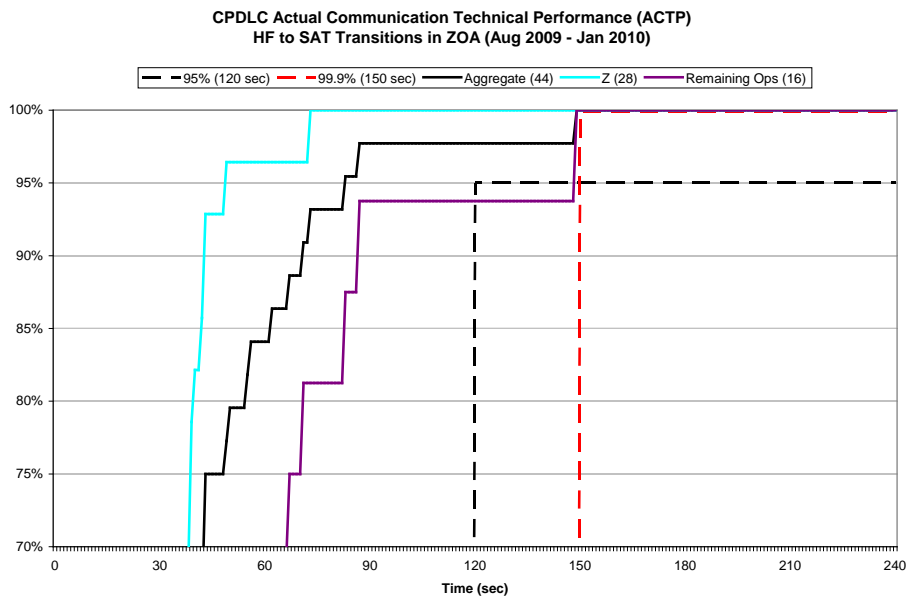


Figure 11. ACTP – HF to Satellite Transitions in Oakland Oceanic Airspace by Operator

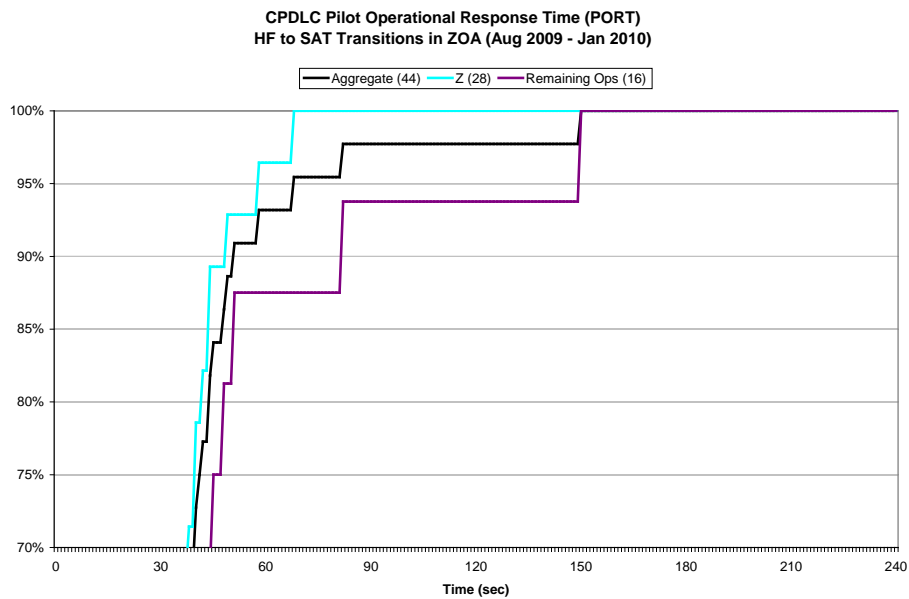


Figure 12. PORT – HF to Satellite Transitions in Oakland Oceanic Airspace by Operator

2.6 Observed Performance from Transitions from HF to VHF Data Link

2.6.1 There were only 10 observed message transitions from HF to VHF data link during the six month period. The aggregate performance for the ACP and ACTP did not meet either the 95 or 99.9 percent criteria for messages of this type.

2.7 Observed Performance from Transitions from VHF to HF Data Link

2.7.1 There were only 5 observed message transitions from VHF to HF data link during the six month period. The aggregate performance for the ACP and ACTP did not meet the 95 percent criteria for messages of this type.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) Note the information contained within this paper.