



Helicopter Operations Monitoring Program

FOQA Workshop
HAI 2009



Helicopter Operations Monitoring Program (HOMP)

A Flight Data Management Program for helicopters that was developed in the United Kingdom in joint cooperation by:

- Bristow Helicopters
- Royal Dutch Shell
- British Airways
- The Civil Aviation Authority

Currently in use by Bristow EH to monitor our North Sea flight operations.

Gulf of Mexico

2005: A decision was made by Air Logistics LLC to put together a FOQA program as a proactive solution to improve the safety of flight operations in the Gulf of Mexico as well as help deal with the Industry's accident and incident rate.

Start Up

- Our partner Bristow UK, already operating an established FOQA program, was initially consulted for their help in the development of this initiative.
- Representatives of the Airline Industry having many years of experience with FOQA were visited about their active programs and for recommended procedures concerning our planned implementation and FAA approval.
- CAPACG was subsequently contracted for help in preparation of an approved FOQA Implementation and Operations (I & O) Plan.

Why an FAA Approved FOQA Program?

- Access to safety related information between industry FOQA participants.
- Protected communication between HOMP and Air crew members.
- Incentives provided by FAA for operators and crew members that participate in FOQA.

Agreement

- In order to have a successful program it is imperative that open communications between concerned parties always be maintained.
- An agreement between the company and the pilots union was completed to insure crewmember confidentiality and that except in the case of deliberate or illegal acts, the program would be non-punitive in nature.

Priorities

Air Logistics Fleet

- 124 Small, Single Engine Aircraft
 - >80% of the fleet was flown single pilot to remote locations and with limited oversight.
 - > 80% of the operations (sorties) and flight time was logged in these aircraft.
 - Historically, most helicopter incidents and accidents have occurred in small aircraft.

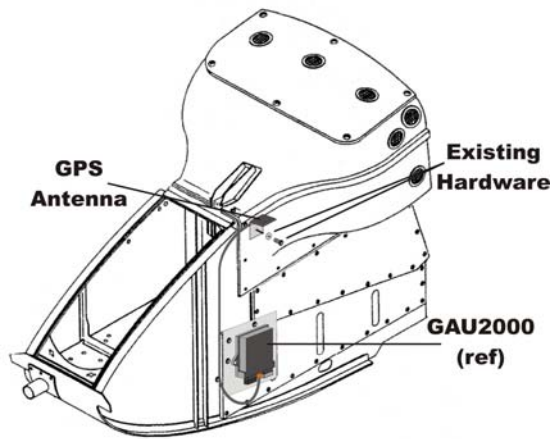
Priorities cont.

- 23 Medium and large aircraft.
 - <20% of the fleet were crew served aircraft and with good crew resource management and two pilots on board there is naturally some operational oversight.
 - FOQA technology for these aircraft was then incomplete but on the horizon.
- Consequently the small helicopter fleet was selected as a priority for HOMP.

HOMP Gulf of Mexico

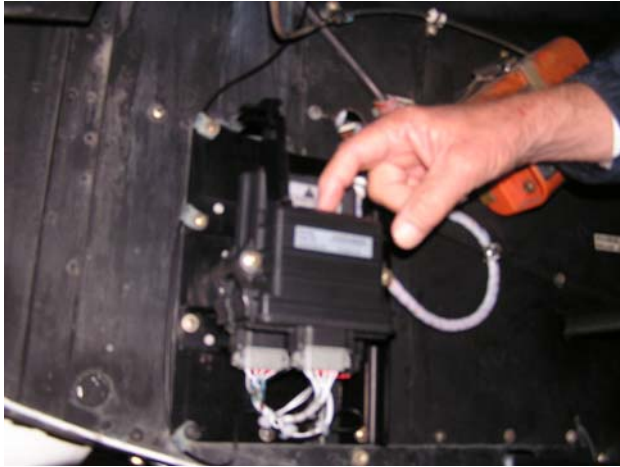
- Air Logistics researched the availability of an off the shelf flight monitoring device for small helicopters, but found nothing suitable.
- Air Logistics partnered with Appareo Systems to design and manufacture the Air Logistics Event Recorder for Training Standardization (ALERTS) for that purpose.
- An ALERTS prototype was tested in one of our training aircraft beginning in 2006, to develop the analysis and visual software.

Typical ALERTS Installation



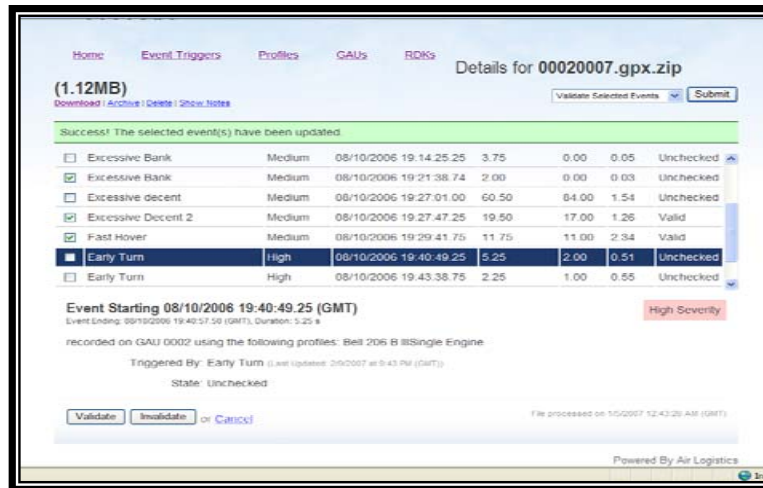
- ALERTS STC issued August 2007 with phased installations beginning in September 2007.
- All operational B206/407 aircraft were equipped with ALERTS by December 2008.

HOMP in Practice



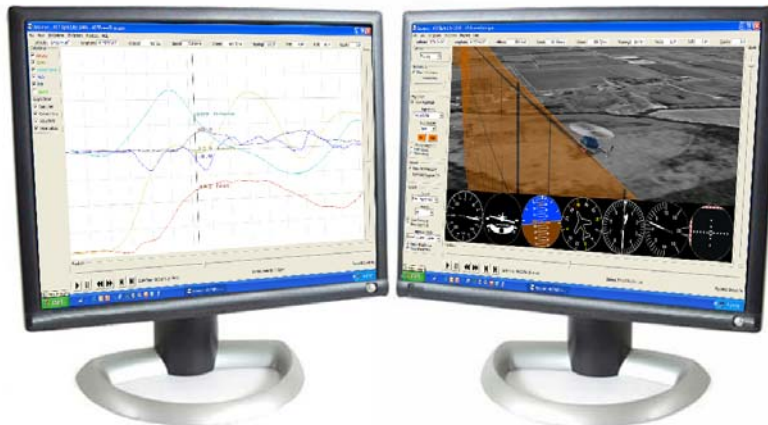
- ALERTS Operations
 - Pilot installs SD card in on board ALERTS during preflight inspection.
 - He/She removes the SD card during post flight duties.
 - The days flight data is then uploaded into a Remote Data Kiosk (RDK) that is located in the pilots ready room at each base operations.

HOMP Software



ALERTS

- A Web Based integrated system designed by Appareo for analysis, and trending of HOMP data for our Bell 206 and 407 aircraft.
- Daily flight Data is pre-processed by each RDK, then uploaded to the Appareo Web Application for analysis through a user defined event set.



Validation

- Appareo ASF [3D Flight recreation software]
 - The analyst downloads and verifies each event from the web application daily.
 - Record of all events are stored; for trend analysis and for future system development.
 - ASF is used by the analyst for pilot debriefings by graphically recreating event flight data.

Implementation

- Collection and analysis of recorded data began in September 2007 as each Bell 206 & 407 was equipped with ALERTS.
- Pilot de-briefings began immediately, along with the first flight data analysis.
- FAA approval for the Air Logistics LLC FOQA Program April 2008.

Qualified Report Data

- In October 2008 the sale of some 53 Bell 206B, L-1, L-3, & L-4 aircraft was agreed upon by the Bristow Group and Rotorcraft Leasing Corporation.
- A phased transfer of these aircraft to RLC was not completed until February 2009.
- Consequently, the data for this report has been affected by the reduction of those aircraft being monitored through that phase.

ALERTS Phase 1 Event Triggers

Excessive Bank Angle

An angle of bank that is $> 35^\circ$

Excessive climb

A rate of climb that is $> 1500'$ ft./min.

Excessive Descent < 500 ft.

A rate of descent below 500'AGL > 750 ft/min

Excessive Descent > 500 ft

A rate of descent above 500'AGL > 1250 ft/min

Excessive Pitch Angle Landing

A pitch up angle landing $< 150'$ AGL that is $> 18^\circ$

Excessive Pitch Angle T/O

A pitch down angle during take off that is $> 13^\circ$

Excessive Roll Rate

A rate of roll that is $> 30^\circ$ /sec.

Excessive Yaw Rate

A rate of yaw that is $> 30^\circ$ /sec.

Low Cruise

Extended flight over land that is $< 250'$ AGL

Low Cruise Offshore

Extended flight over water that is $< \text{HSAC}$ altitudes

Low Turn to Final

Final turn for landing that is $< 300'$ AGL

Negative G Loading

Vertical G loading that is $< +.2$ G

Premature Departure Turn

A turn from the take off heading at $< 300'$ AGL*

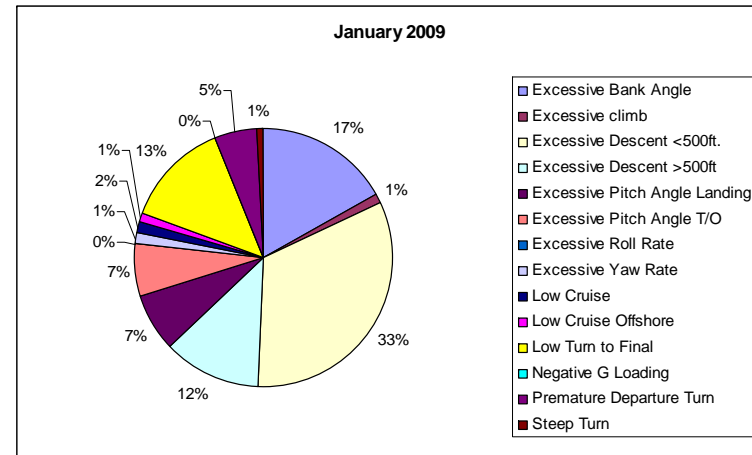
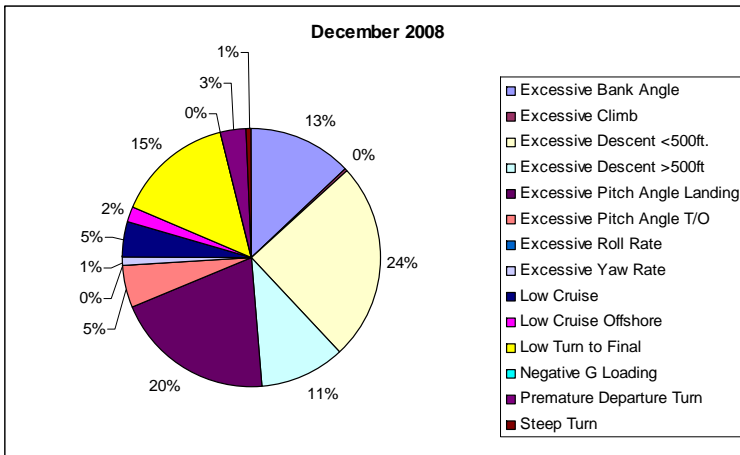
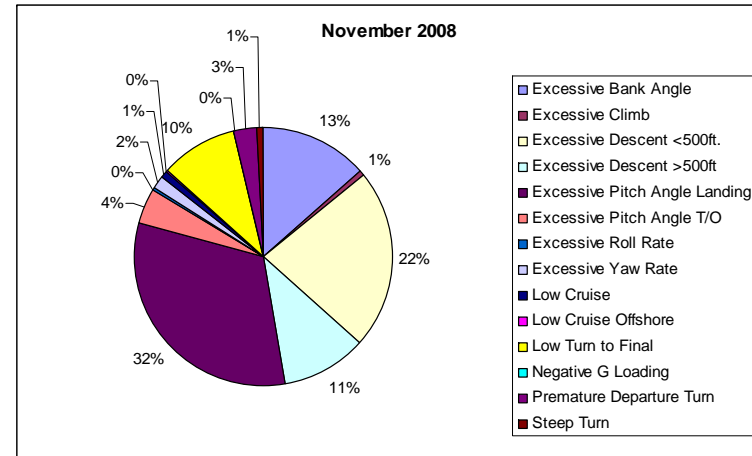
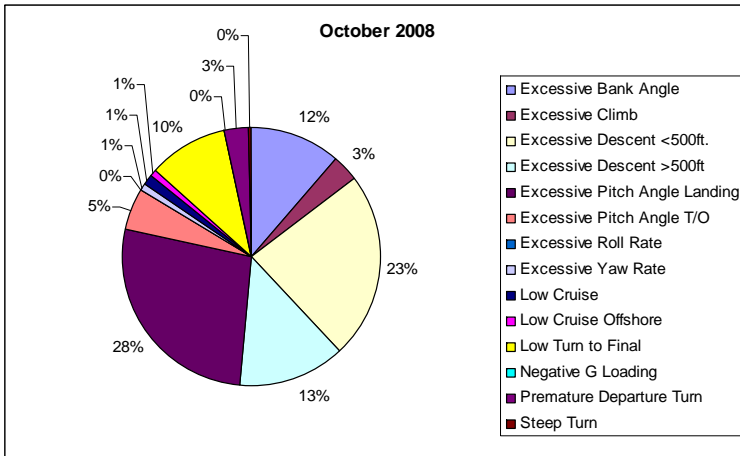
Steep Turn

An angle of bank that is $> 45^\circ$

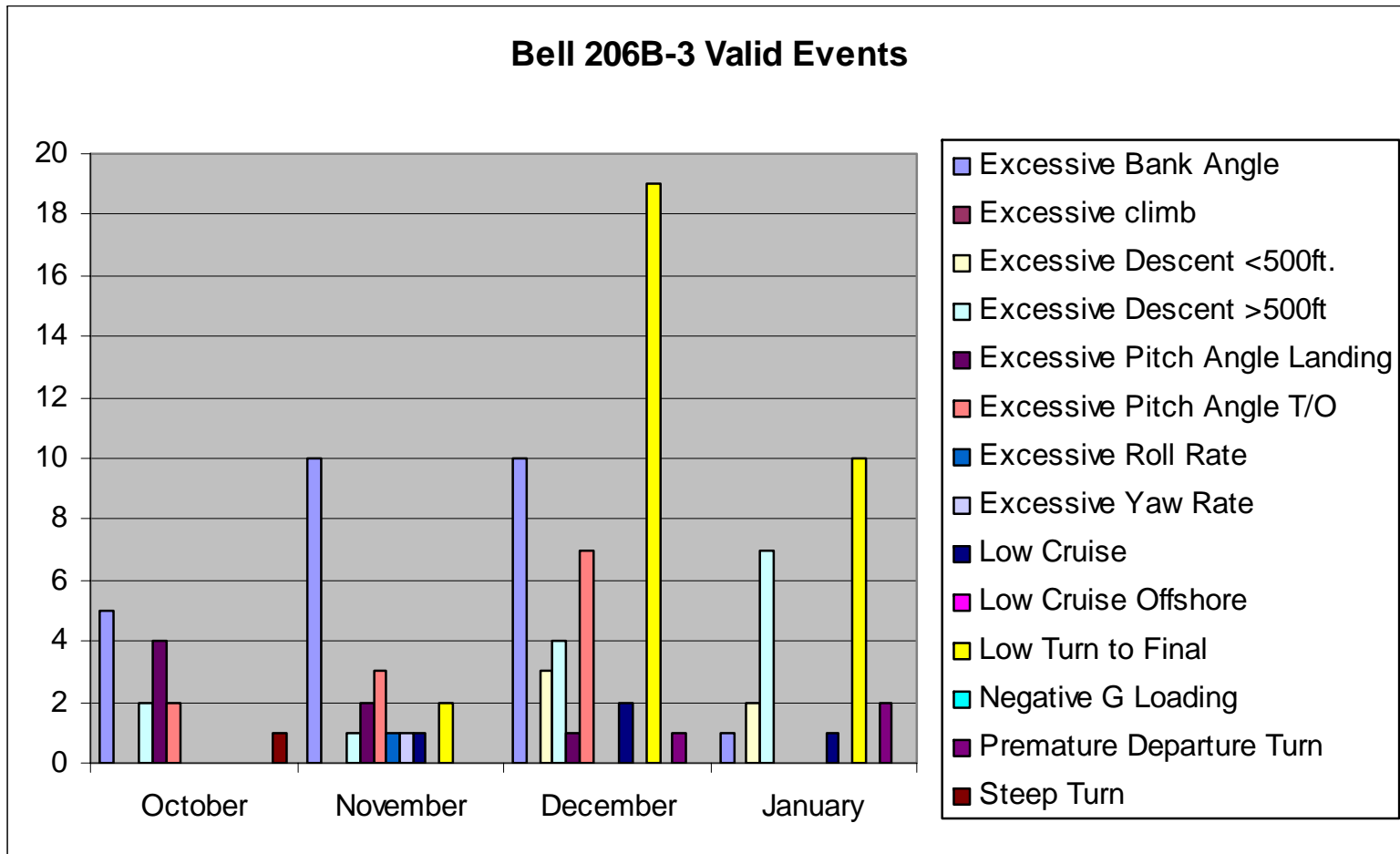
January 2009 Event Table

January Valid Events	206B-3	206L-1	206L-3	206L-4	407	Total
Excessive Bank Angle	1	7	5	57	63	133
Excessive climb	0	0	0	4	4	8
Excessive Descent <500ft.	2	2	1	48	203	256
Excessive Descent >500ft	7	1	0	12	75	95
Excessive Pitch Angle Landing	0	0	0	0	56	56
Excessive Pitch Angle T/O	0	12	2	25	14	53
Excessive Roll Rate	0	0	0	0	0	0
Excessive Yaw Rate	0	0	0	0	10	10
Low Cruise	1	0	0	6	5	12
Low Cruise Offshore	0	0	2	5	2	9
Low Turn to Final	10	0	1	36	58	105
Negative G Loading	0	0	0	0	0	0
Premature Departure Turn	2	0	3	16	20	41
Steep Turn	0	1	0	2	3	6
Total	23	23	14	211	513	784

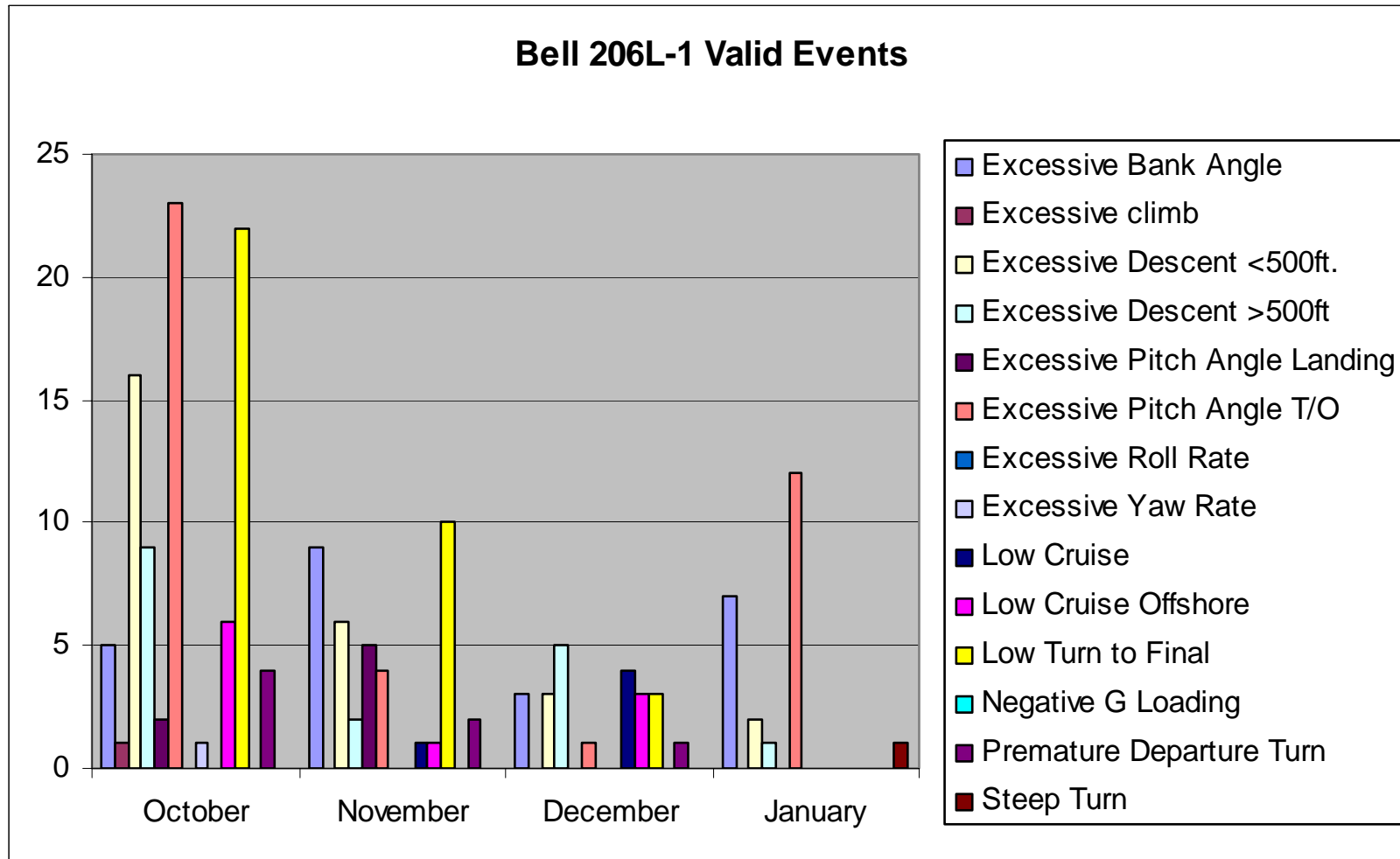
Event Percentages by Month



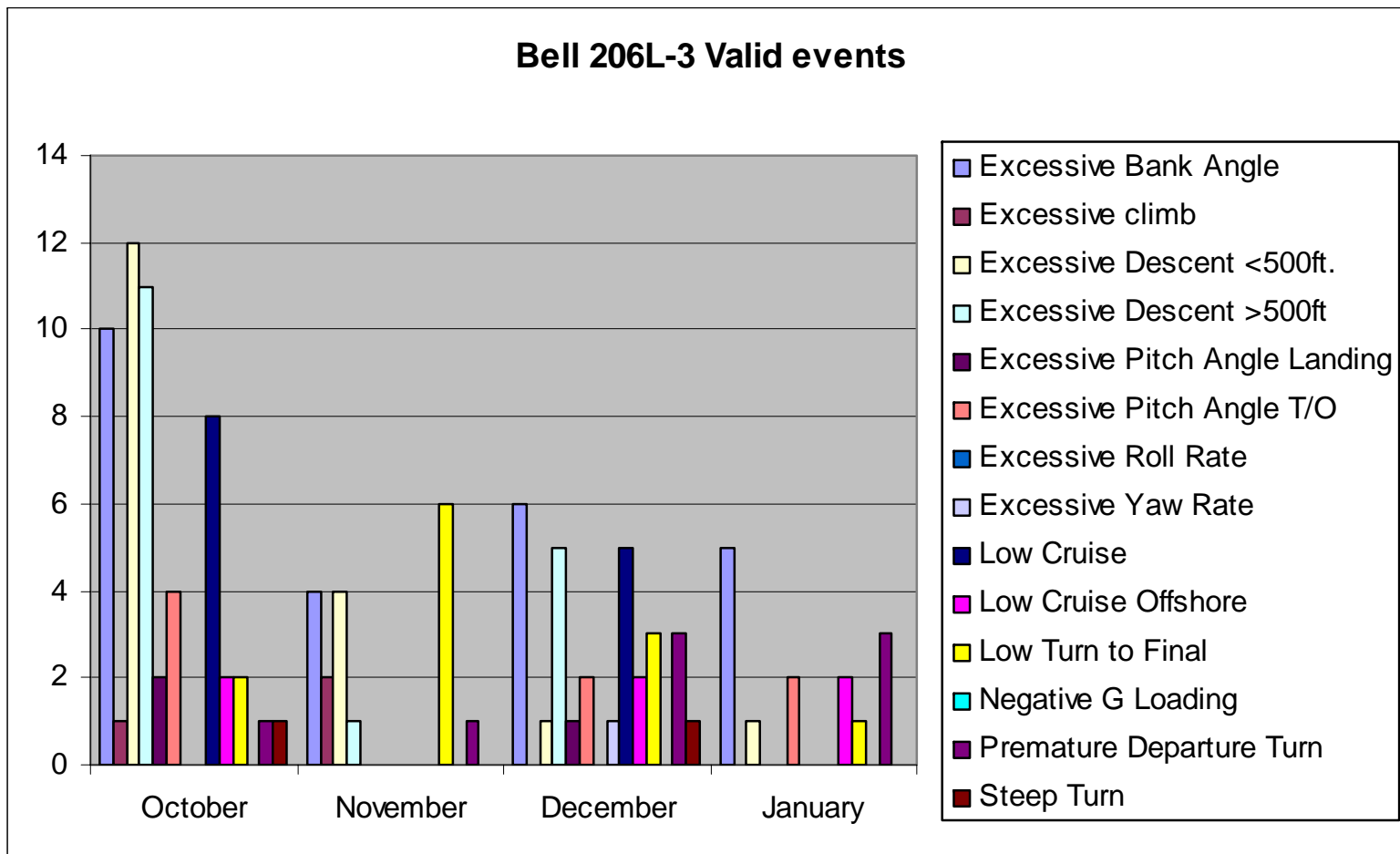
Bell 206B-3 Valid Events



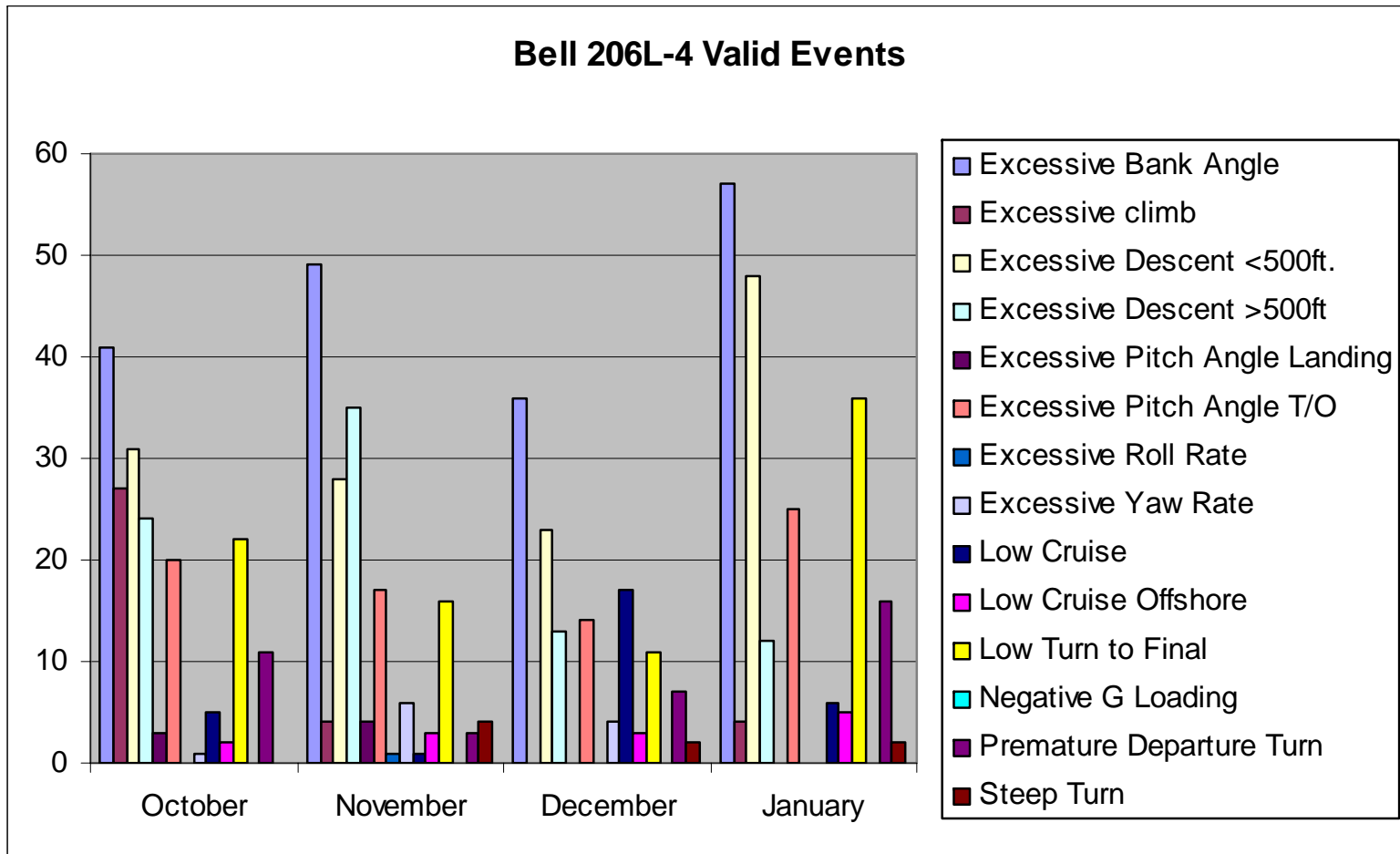
Bell 206L-1 Valid Events



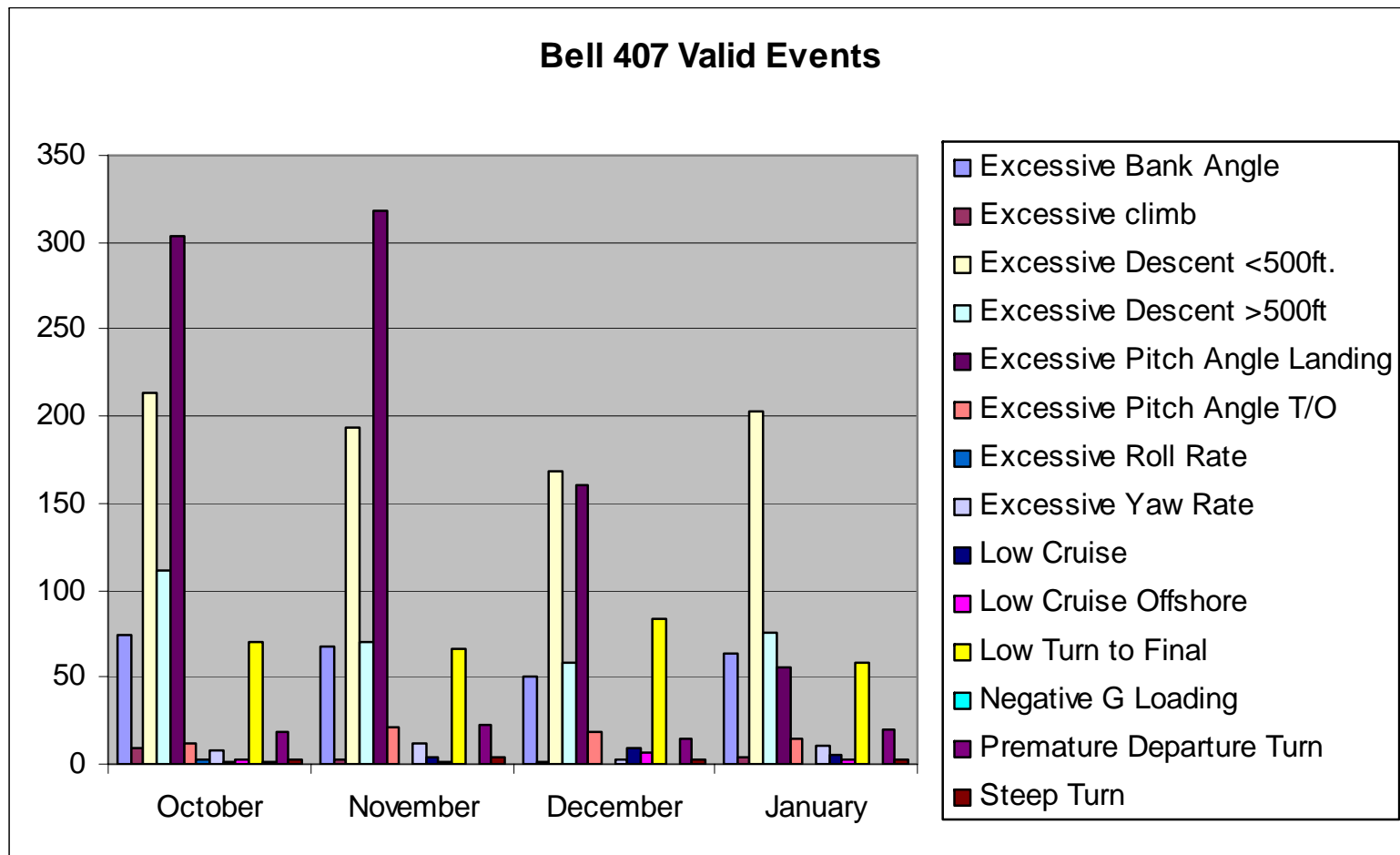
Bell 206L-3 Valid Events



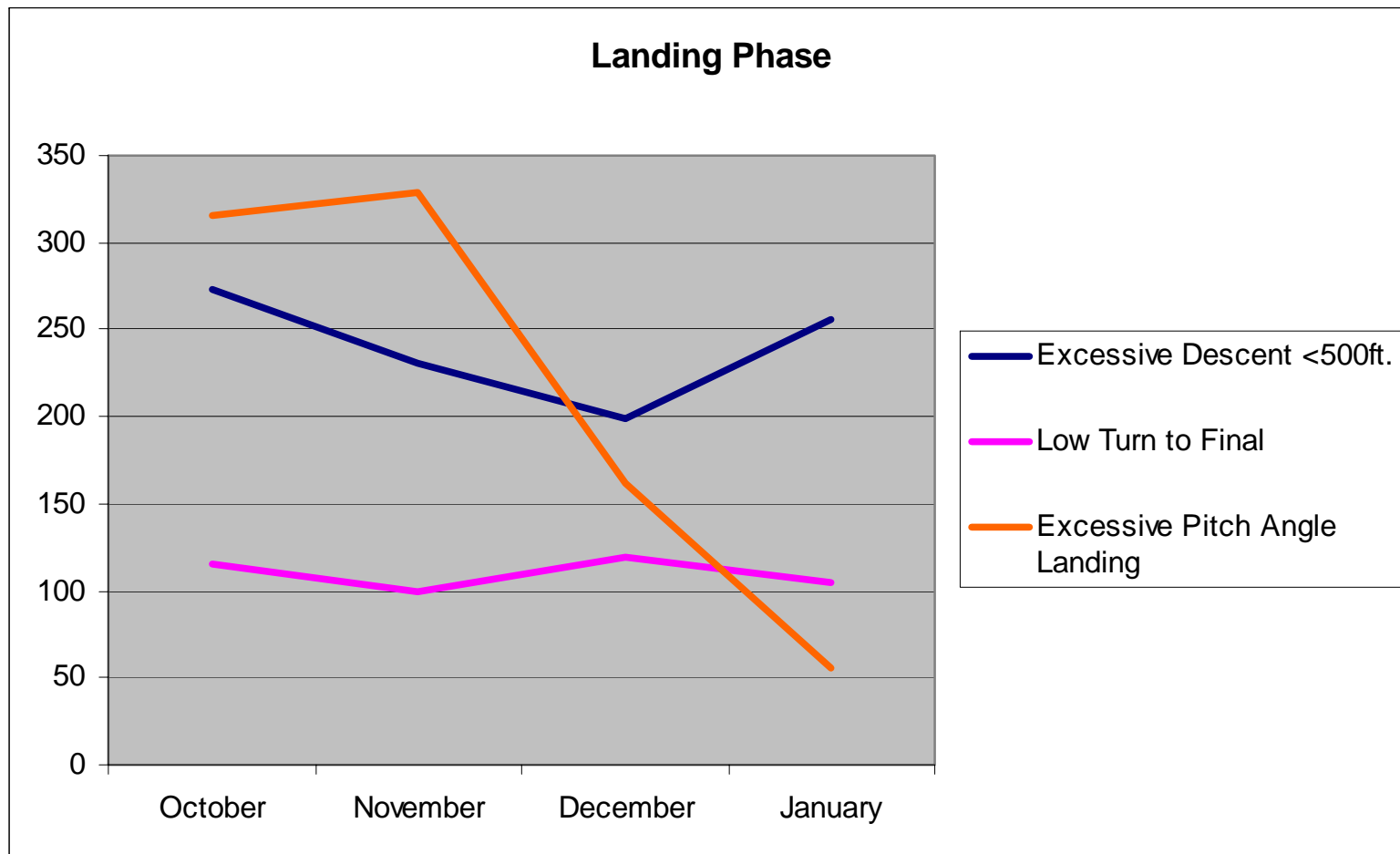
Bell 206 L-4 Valid Events



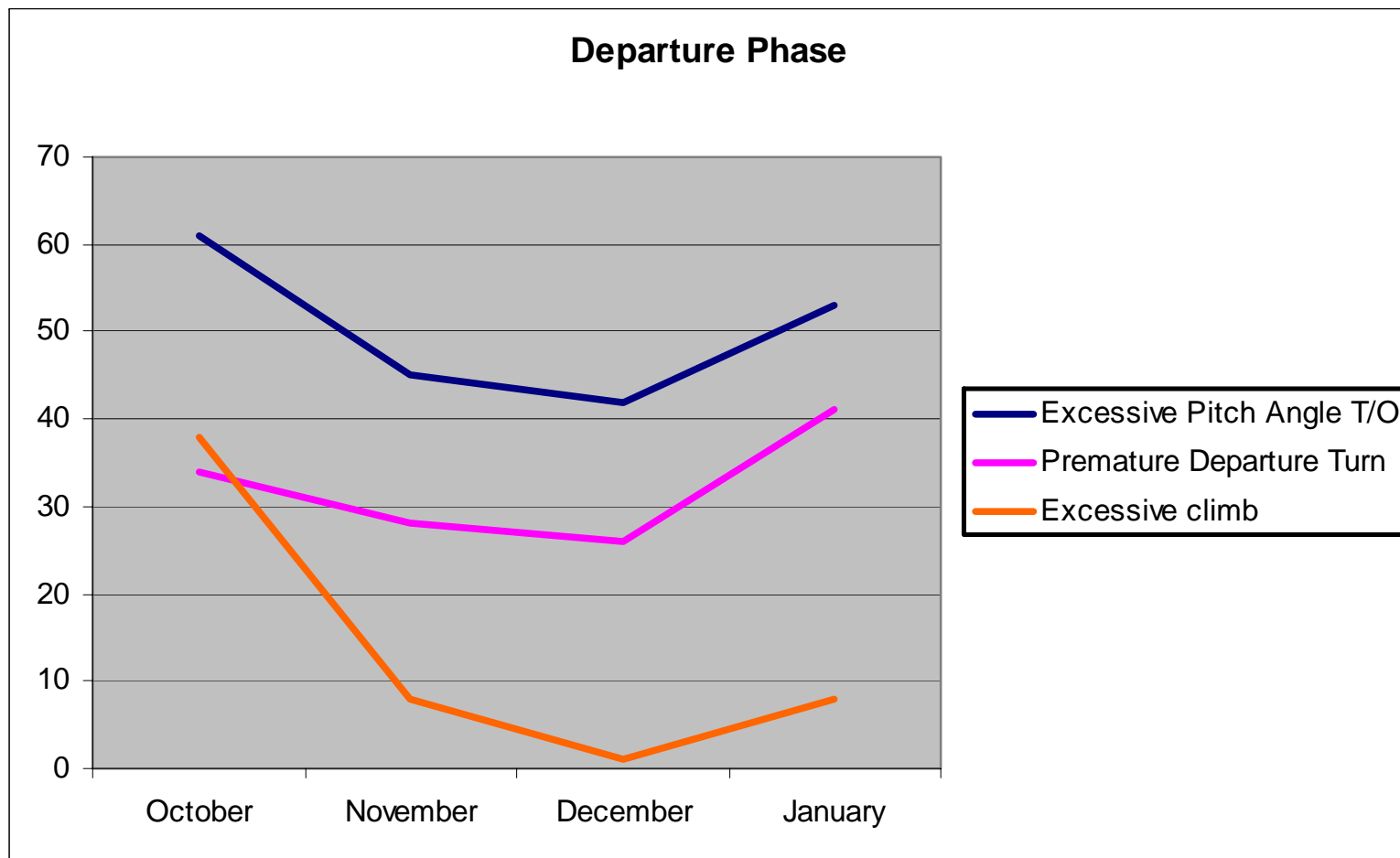
Bell 407 Valid Events



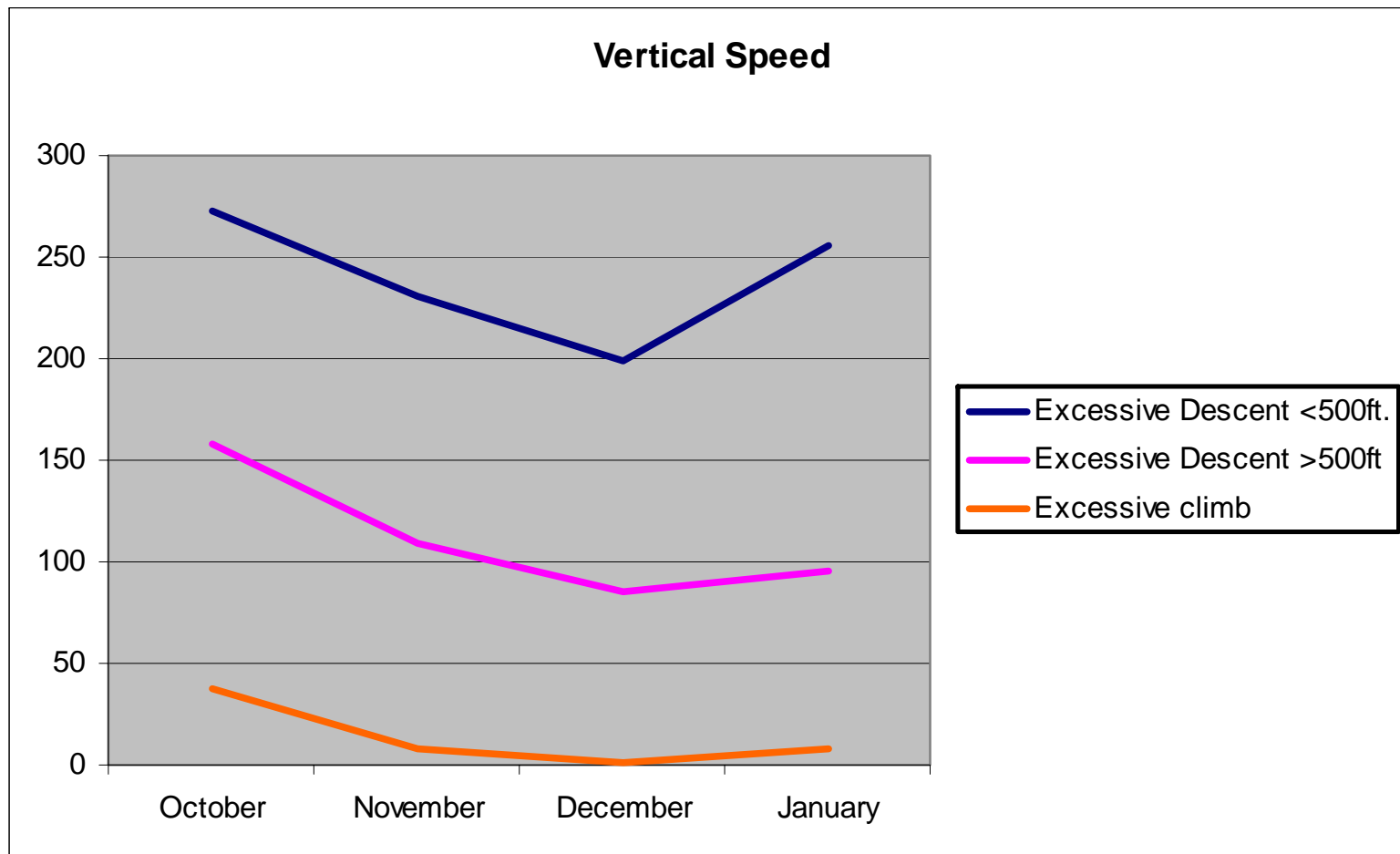
Landing Trend



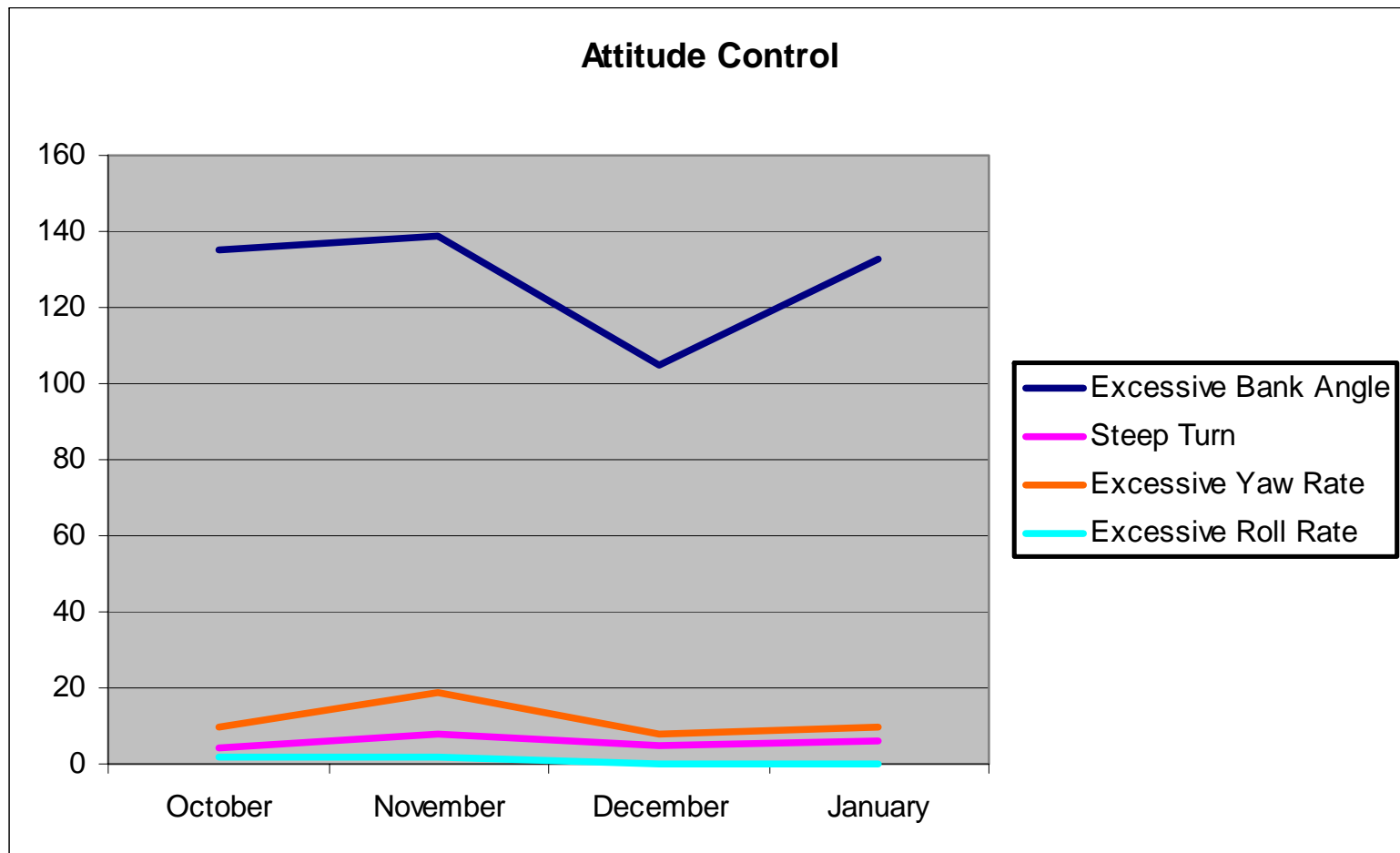
Departures Trend



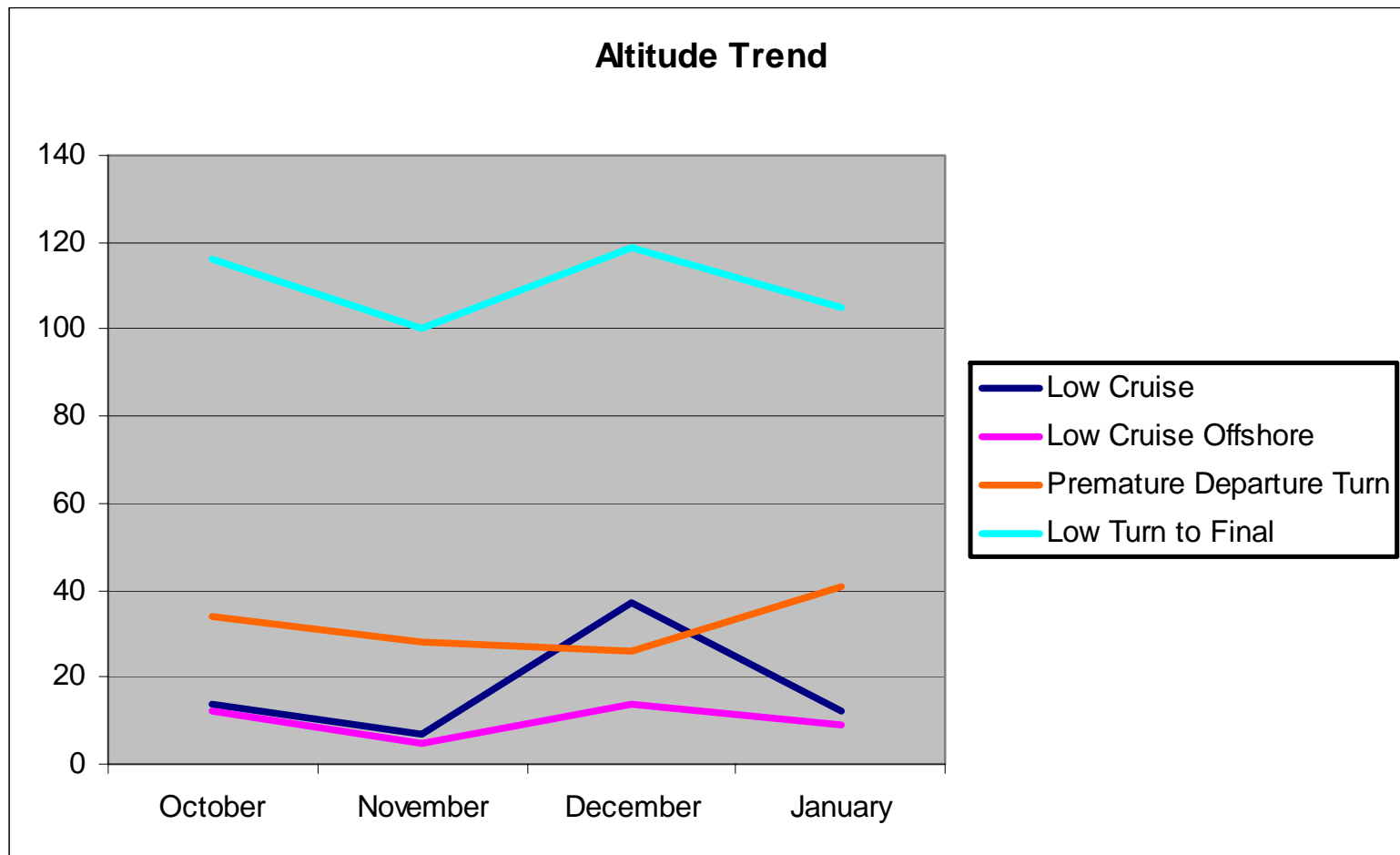
Vertical Speed Trend



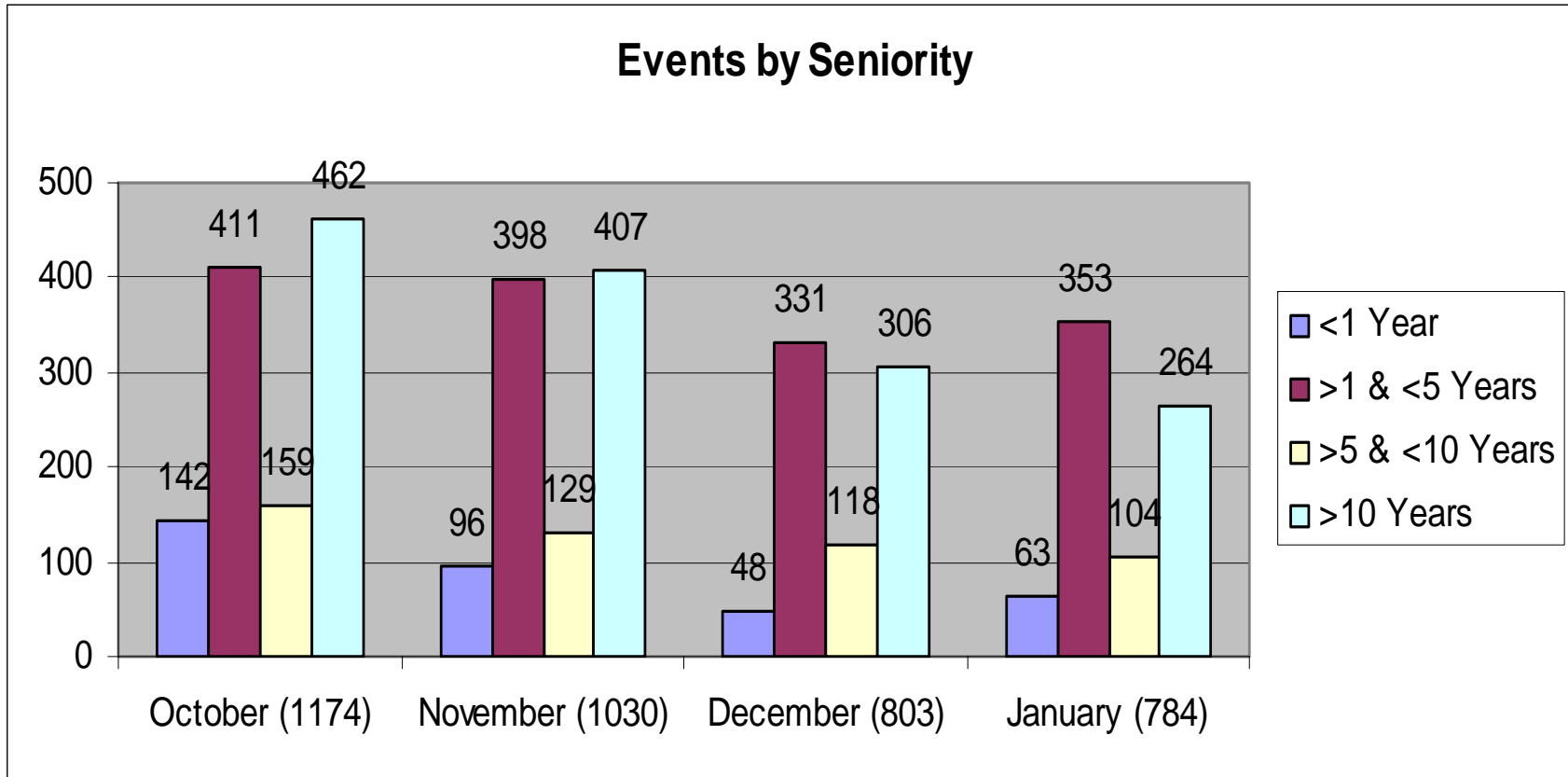
Attitude Trend



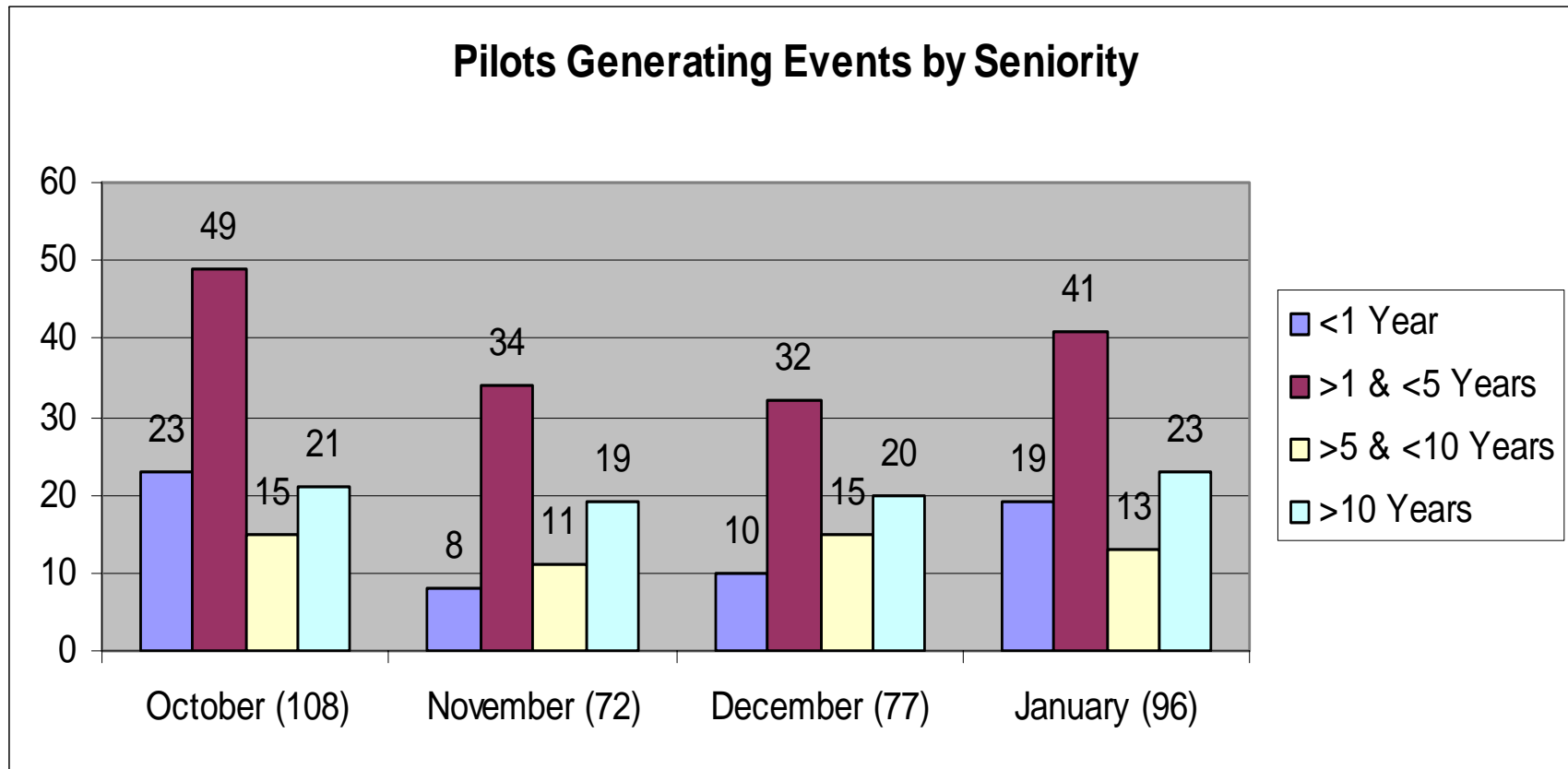
Altitude Trend



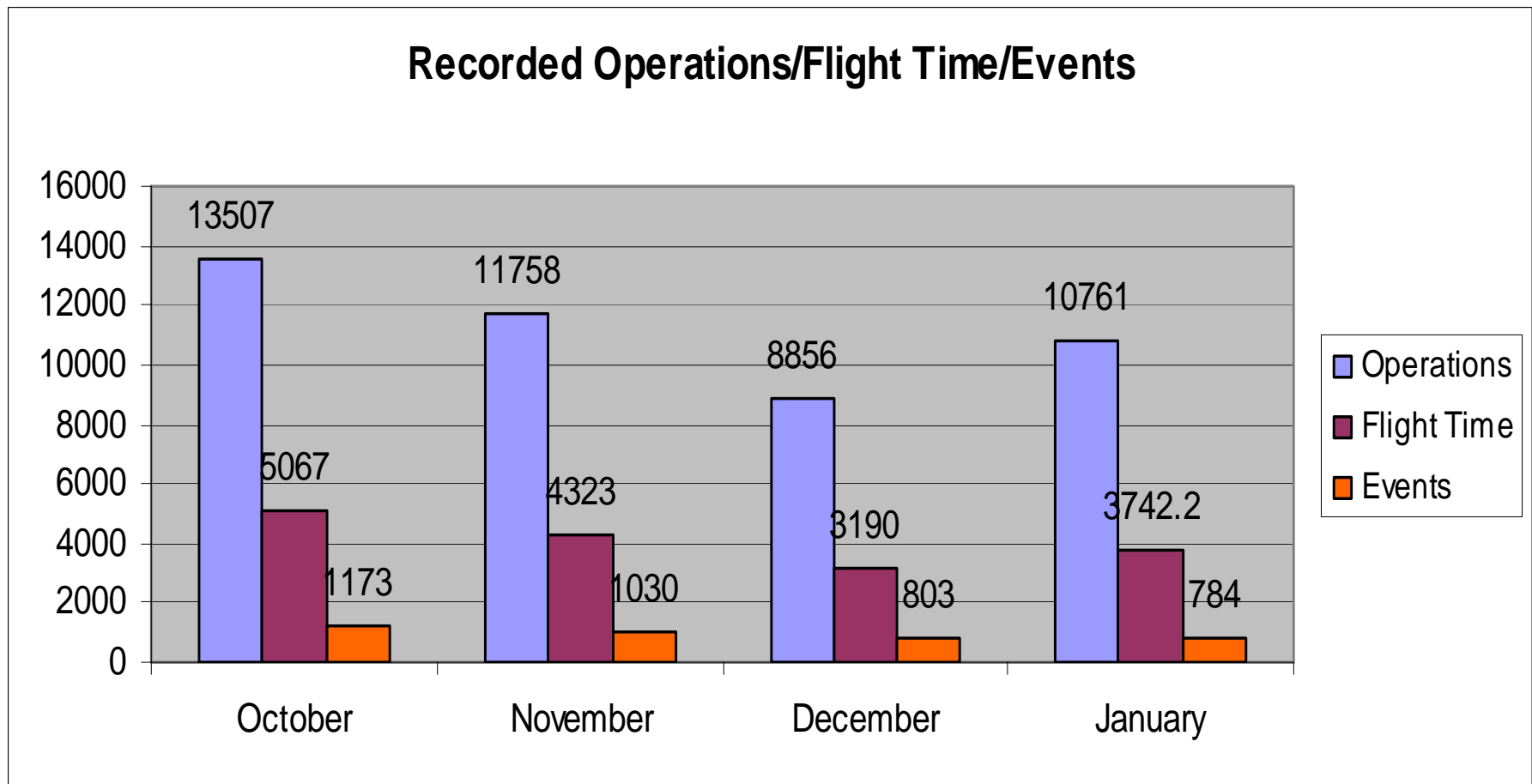
Valid Events by Seniority



Pilot with Valid Events by Seniority



Fall/Winter Trend



HOMP Benefits

- Trending of data helps our flight standards department to set priorities in initial and recurrent training.
- Oversight helps to increase our pilots situational awareness and to minimize complacency.
- Pilots talk about their HOMP events and others naturally learn from those experiences and increase awareness.

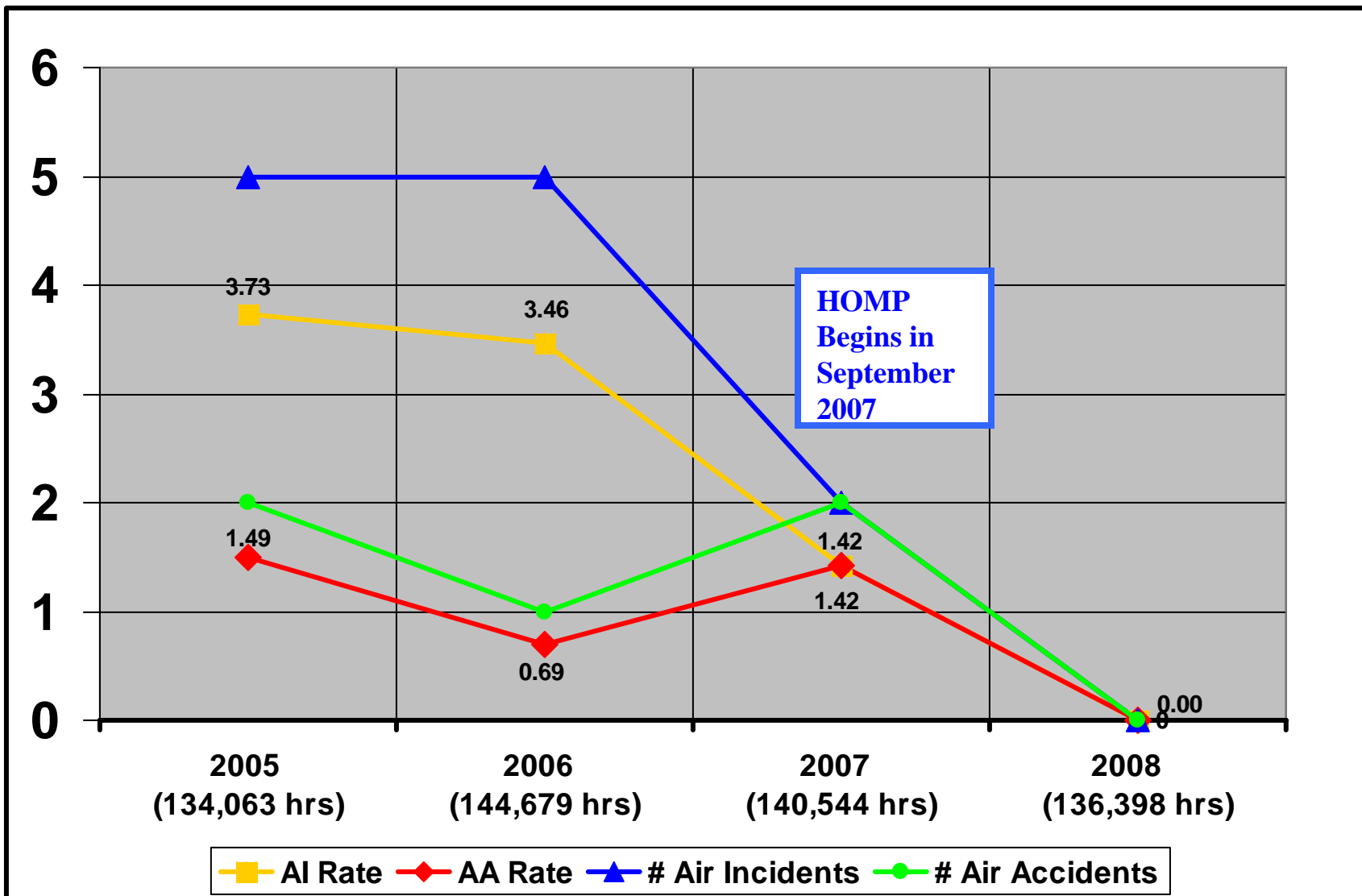
Looking Forward

- Appareo ALERTS Phase 2 is in final development and will enhance the effectiveness of HOMP for our small aircraft fleet.
- FlightScape Insight has been selected to provide Flight Data Management for our Sikorsky S76 and S92 fleet. Training and Implementation is to begin in March 2009.

“TARGET ZERO”

- **A Bristow Group global safety initiative and vision that strives to achieve:**
 - **Zero Accidents**
 - **Zero Harm to People**
 - **Zero Harm to the Environment**
- **The Helicopter Operations Monitoring Program is but one part of that culture.**

“TARGET ZERO”



Conclusion

Questions?

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