IAA presentation to the NBAA Committee:

CFIT/Level Bust prevention at Shannon

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17th October 2022

Topics

- ***What*** *is a Level Bust and a CFIT?*
- ***Where*** *are the Level Busts?*
- ***Who*** *is level busting?*
- ***Why*** *are they level busting?*
- ***What*** *are we doing about it?*
- ***How*** *can YOU help?*

What is a:

LEVEL BUST:

Any unauthorised vertical deviation of more than 300 feet from an ATC flight clearance.

CFIT:

Controlled Flight into Terrain... Most **CFIT** accidents occur in the **APPROACH** and landing phase of flight.

We have never had a CFIT in Shannon but…

*…We do have a high number of level busts, and they are almost all on **Approach***

Where :
Shannon Airport

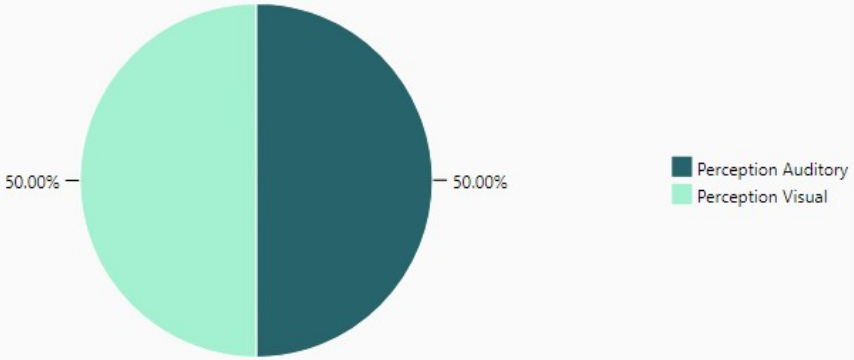
- **Shannon Terminal Business Unit (STBU)**-provides Tower and Approach radar services for **Shannon Airport**, County Clare, Ireland

- **Traffic figures-** Approximately 25,000 flights a year, or 60 per day (pre-pandemic figures)

- **Approximately 30%** of our flights are North American Business jets.

Level Busts (September 2020 - September 2022)

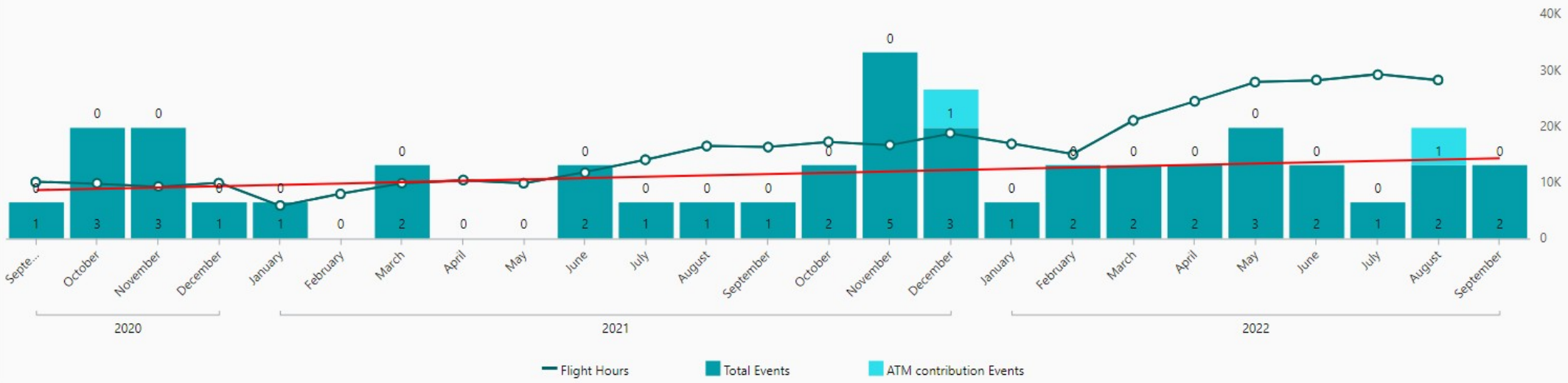
ATC Causal Factors



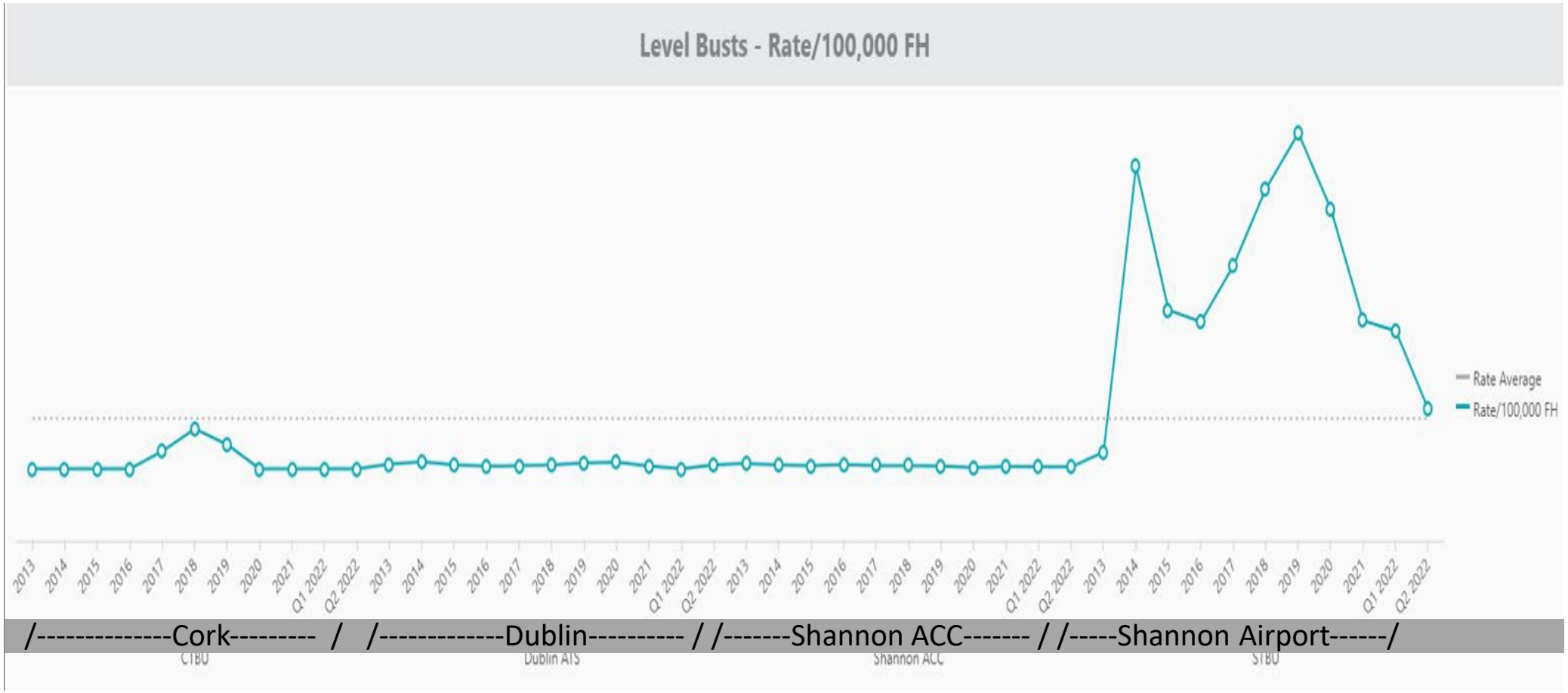
List of ATC Causal Factors

Causal Factor Group	Causal Factor Lvl3	Severity
Perception Auditory	A-1-4. Hear - detection	E
Perception Visual	A-1-2. See - detection	E

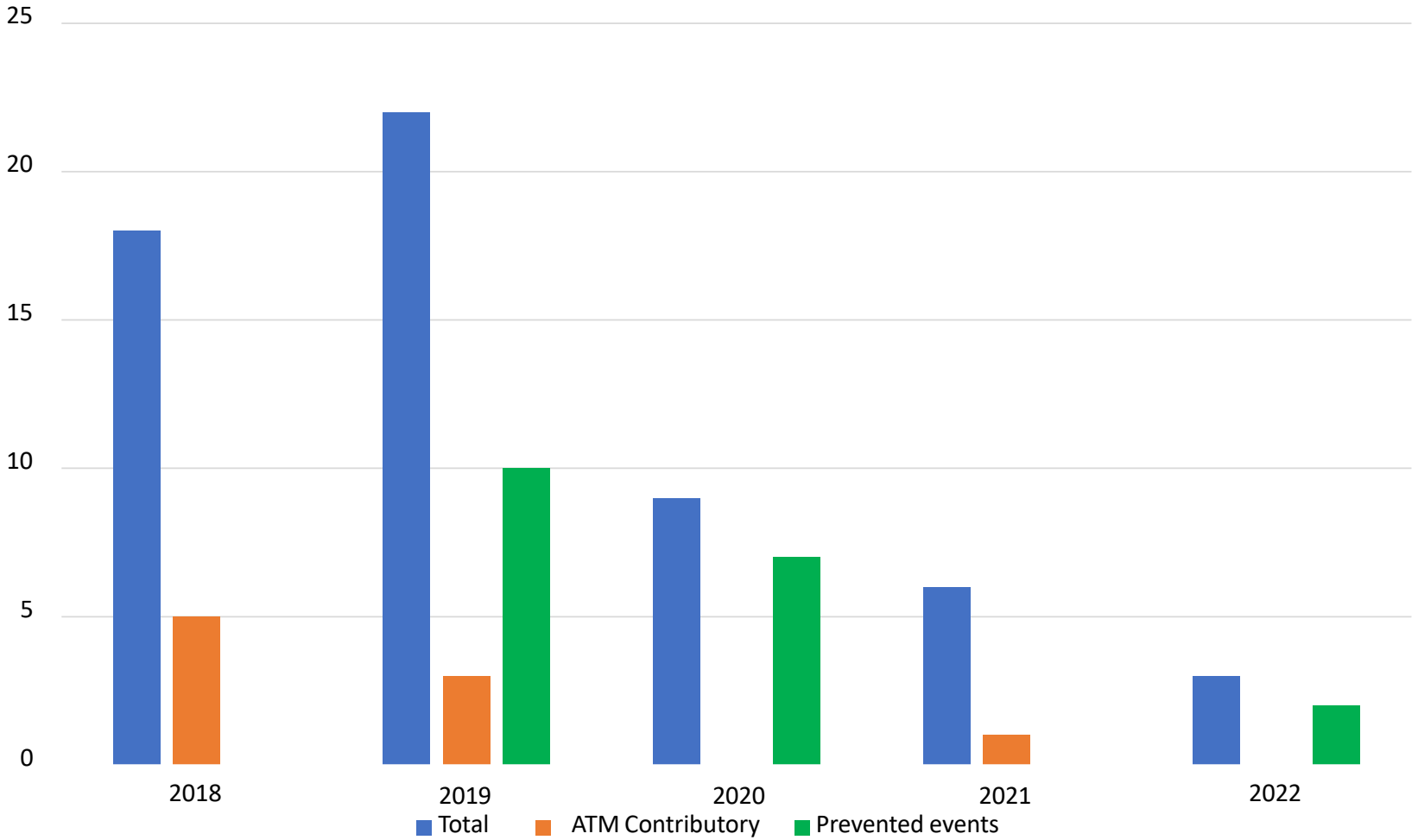
Level Bust - Trend on number of events



Level busts compared to Dublin, Cork and Shannon ACC



Level Busts in Shannon



Level Busts with potential for CFIT events

- We have a disproportionately high number of level busts at Shannon, and they are nearly all on APPROACH

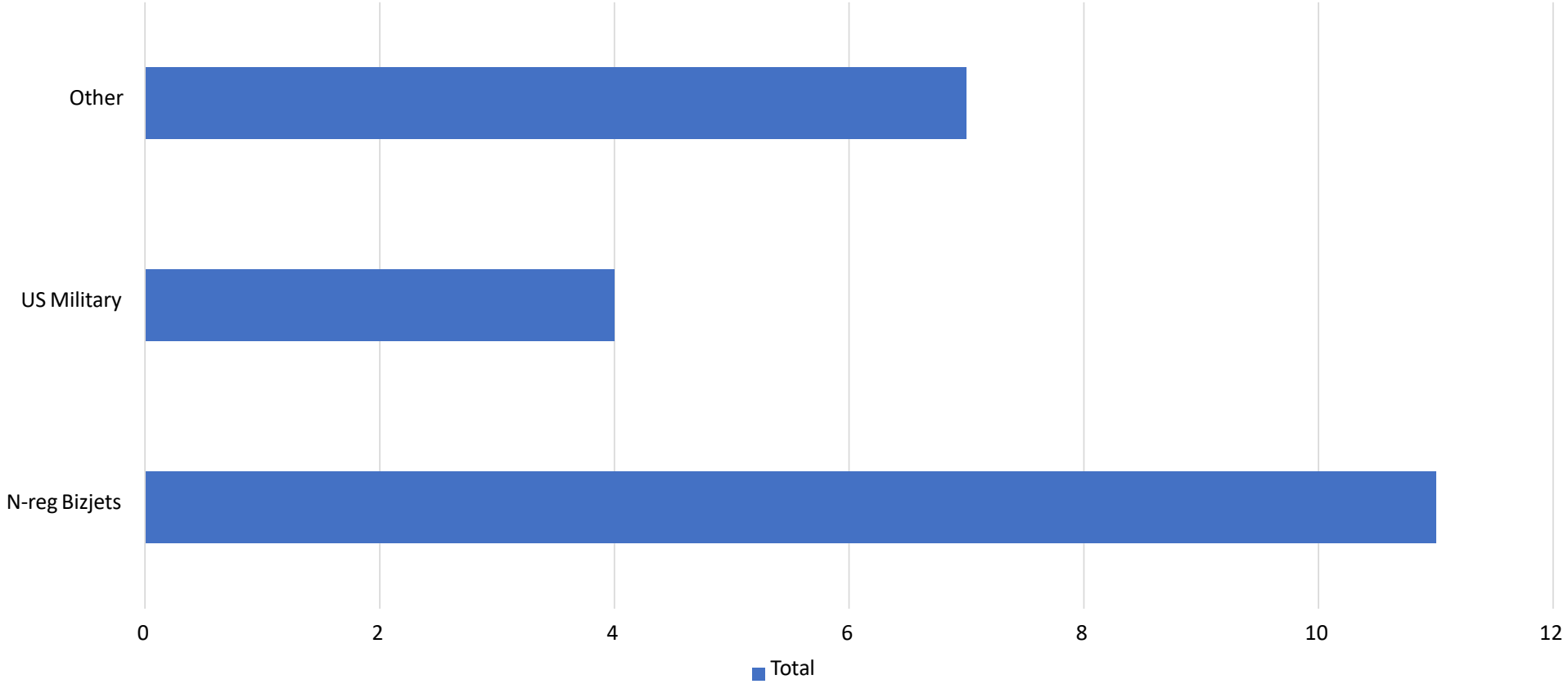
- Most CFIT accidents occur in the APPROACH and landing phase of flight, therefore our level busts carry a greater risk of a CFIT.

- A disproportionate number of these level busts involve North American Business jets

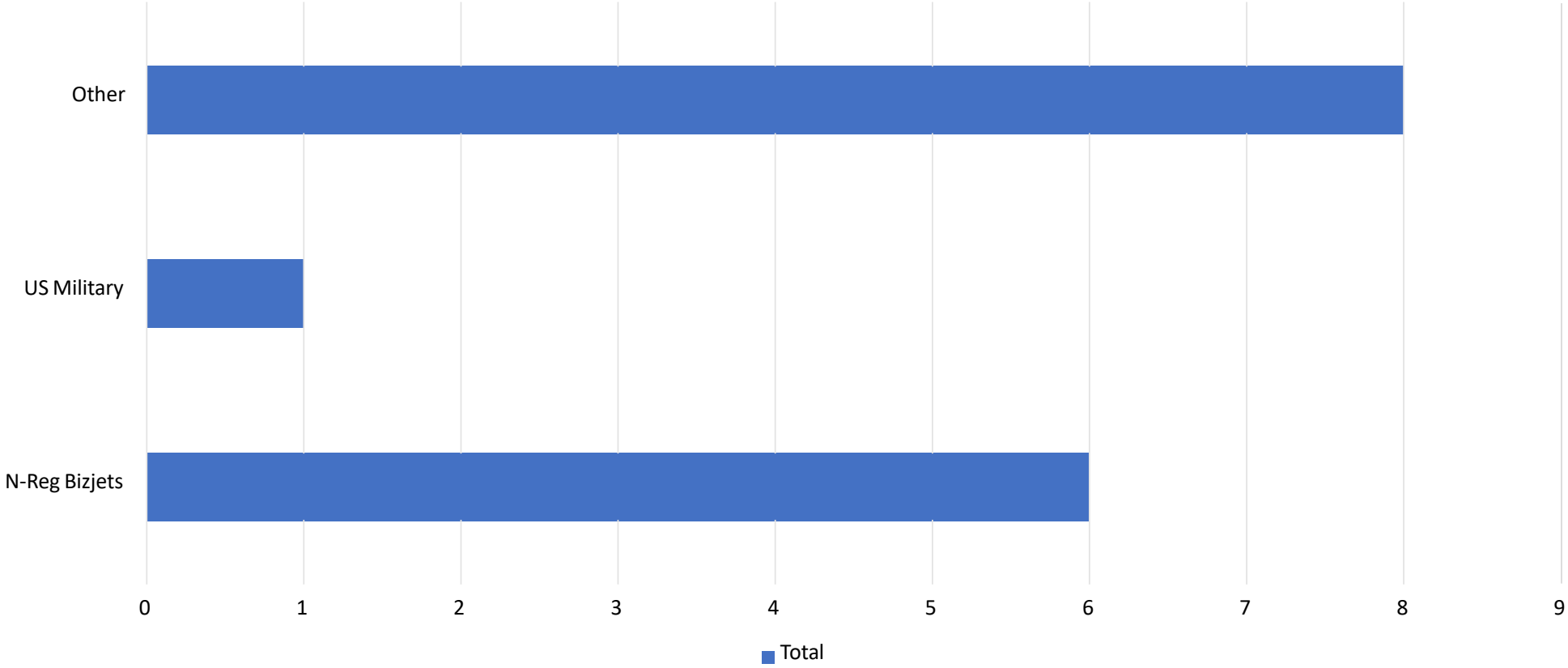
Who : ANALYSIS

North American Business Jets	% of total flights that were North American Business Jets	% of total level busts by North American Business Jets
2018	27%	67%
2019	28%	50%
2020/21	28%	45%
2022	30% YTD	100% YTD

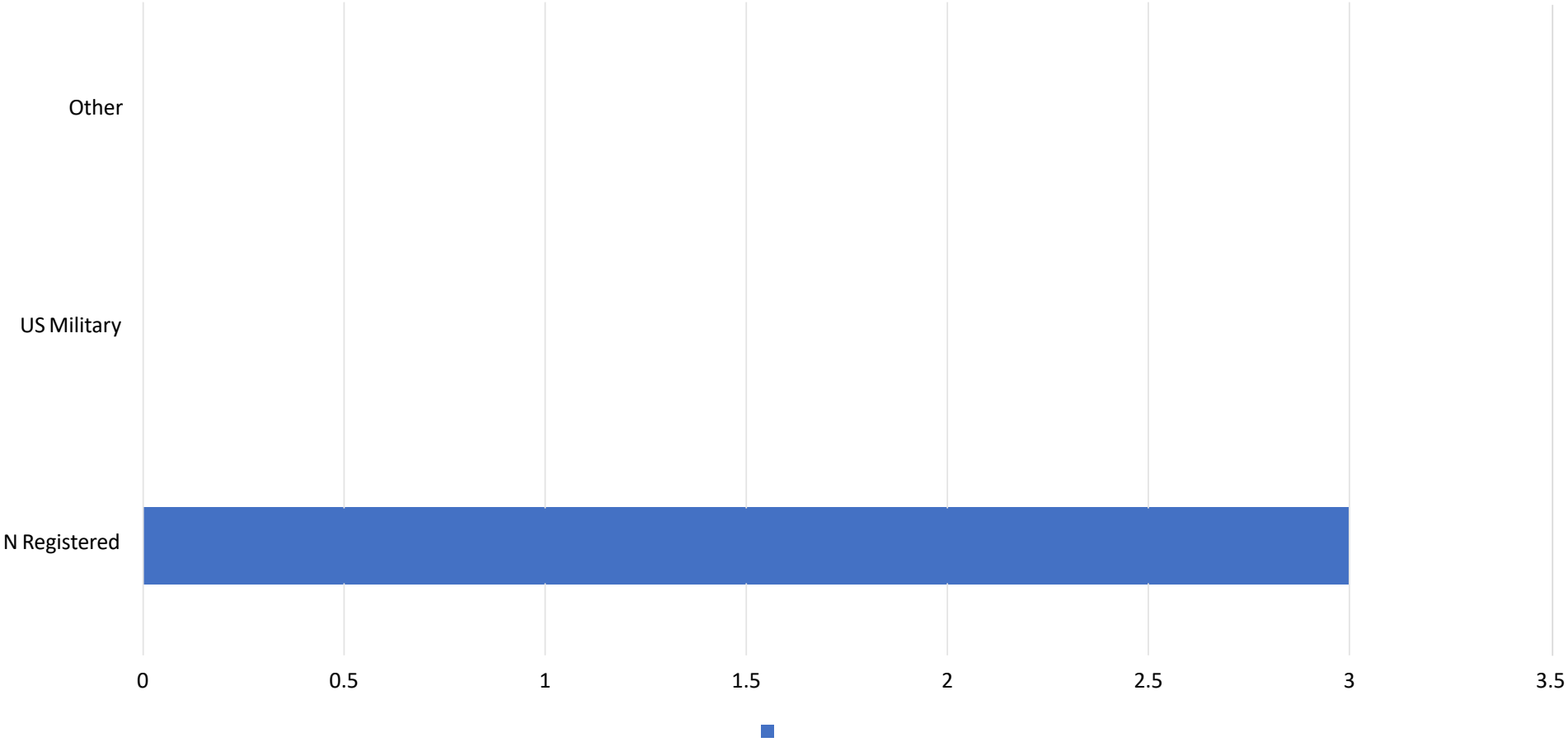
North American Business Jets (+ US Military) accounted for 68% of all level busts in 2019



North American Business Jets (+ US Military) accounted for 47% of all level busts in 2020 & 2021



North American Business Jets have accounted for 100% of all level busts in 2022 YTD



Why : is this happening specifically with North American Business Jets?

- **Failure to select Hectopascals instead of Inches of Mercury**
- **US Trans altitude = 18,000’ Shannon Trans altitude = 5,000’ leading to late/early/no change to local QNH.**
- **Pilot fatigue and increased workload after oceanic trip.**
- **Unfamiliarity with the airspace.**
- **Lack of focus due to forward planning.**
- **Potential expectation of switch to visual clearance from ILS**

Near CFIT event April 2019

- A North American business jet came within 2 nm and 500’ of high ground while attempting to establish on Approach for Runway 24. When cleared to 3000’ on QNH 0988 hpa the aircraft descended to 2300’.

<u>Likely causal factors:</u>

- Failure to switch to Local QNH 0988hpa:

  Standard QNH 1013hpa -0988= 25, 25x30’= 750’

OR

- Setting 2988 inches instead of 0988 hpa:

  2988in = 1012hpa 1012-0988=24, 24x30’= 720’

What **:** have we done to reduce the numbers of level busts?

Actions by ATC

- Operational/Procedural Initiatives
  - Level Bust Prevention Working Group
  - ILS Coverage Map
  - Issuing of QNH
  - Deep dive investigations of all level busts
- Technological Solutions
  - COOPANS pressure advisory tool
- Communications & Promotion
  - Briefing Packs
  - Meetings/presentations
  - ATCO Safety Surveys
- Training
  - Best Practice Document
  - Recurrent Training

Best practice document highlights

- Be alert to aircraft origin
- Remember Low Pressure = High Risk
- Issuing of QNH- “QNH xxxx hPa” full readback incl. hPa must be received.
- Refrain from issuing local QNH on first contact
- Consider altitude checks during descent
- Consider descent to Trans Level first, then altitude when approaching
- Red flags: altitude readback when cleared to a flight level, likely to have switched early to local QNH passing FL180)
- Avoid aggressive descents

Specific Occurrence Investigation

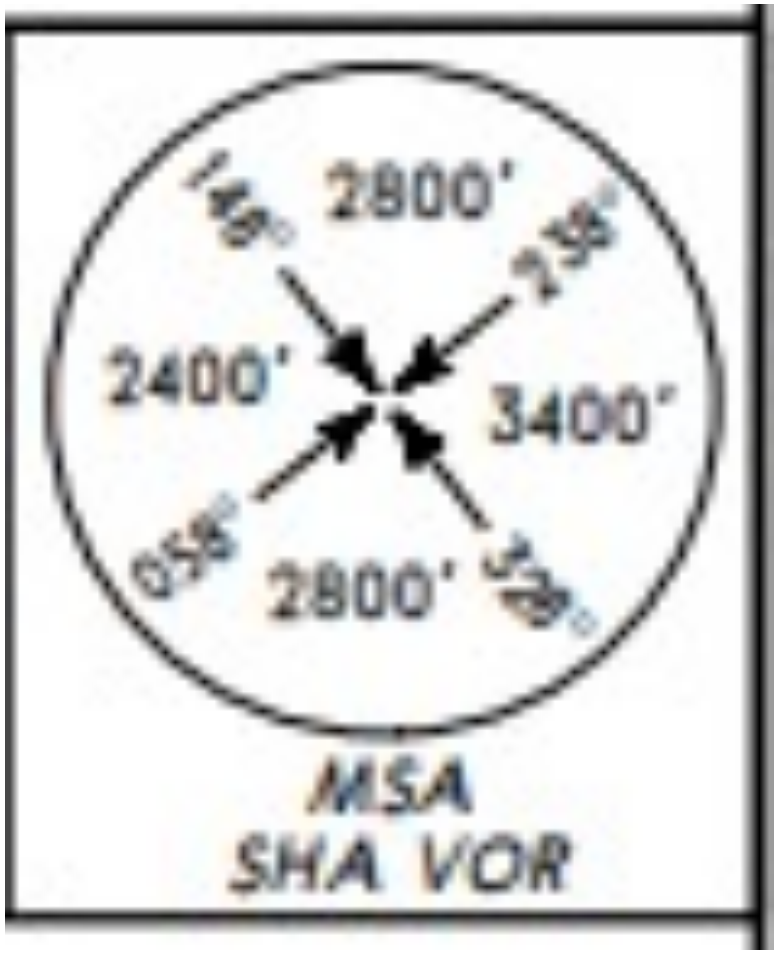
9690 XX/04/2022 STBU

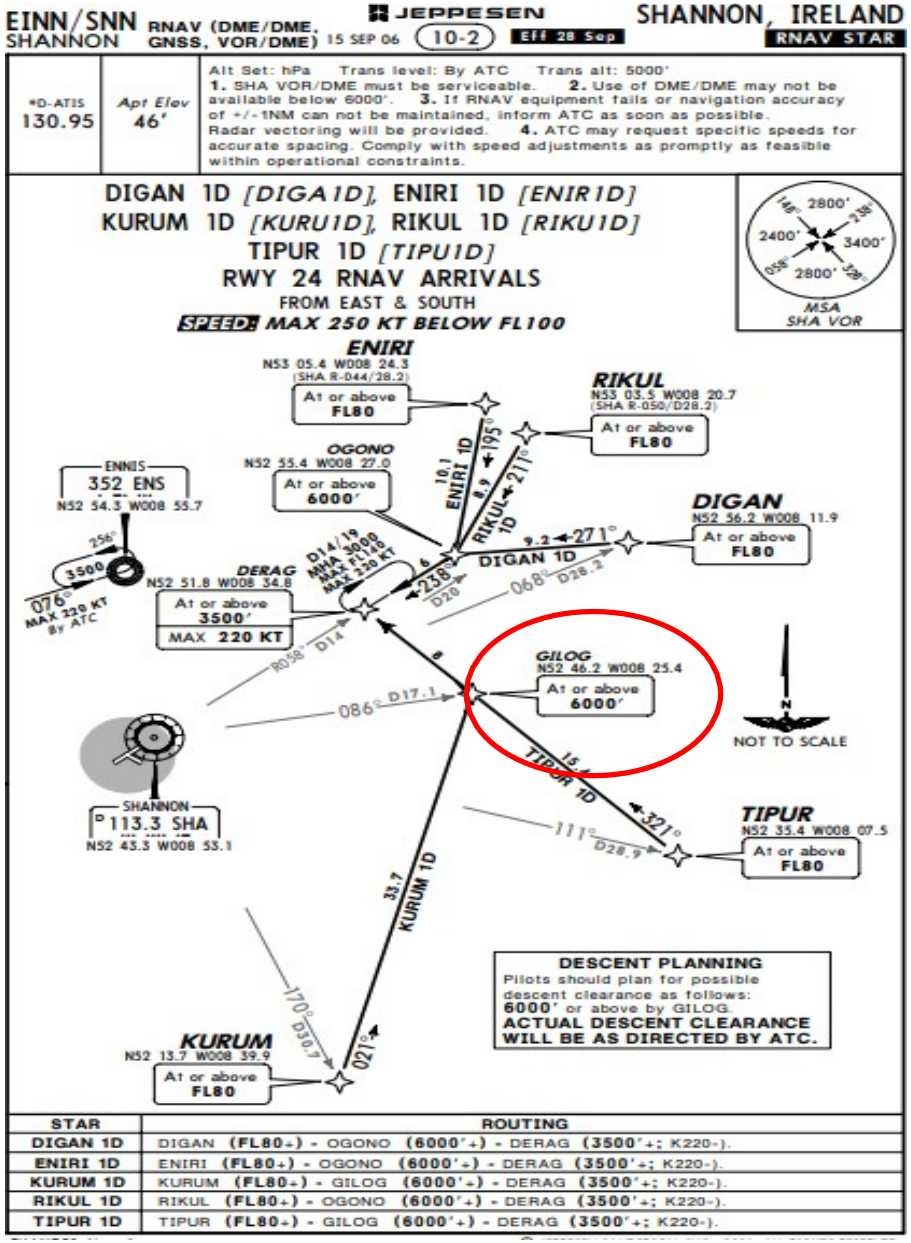
1. Time 0039

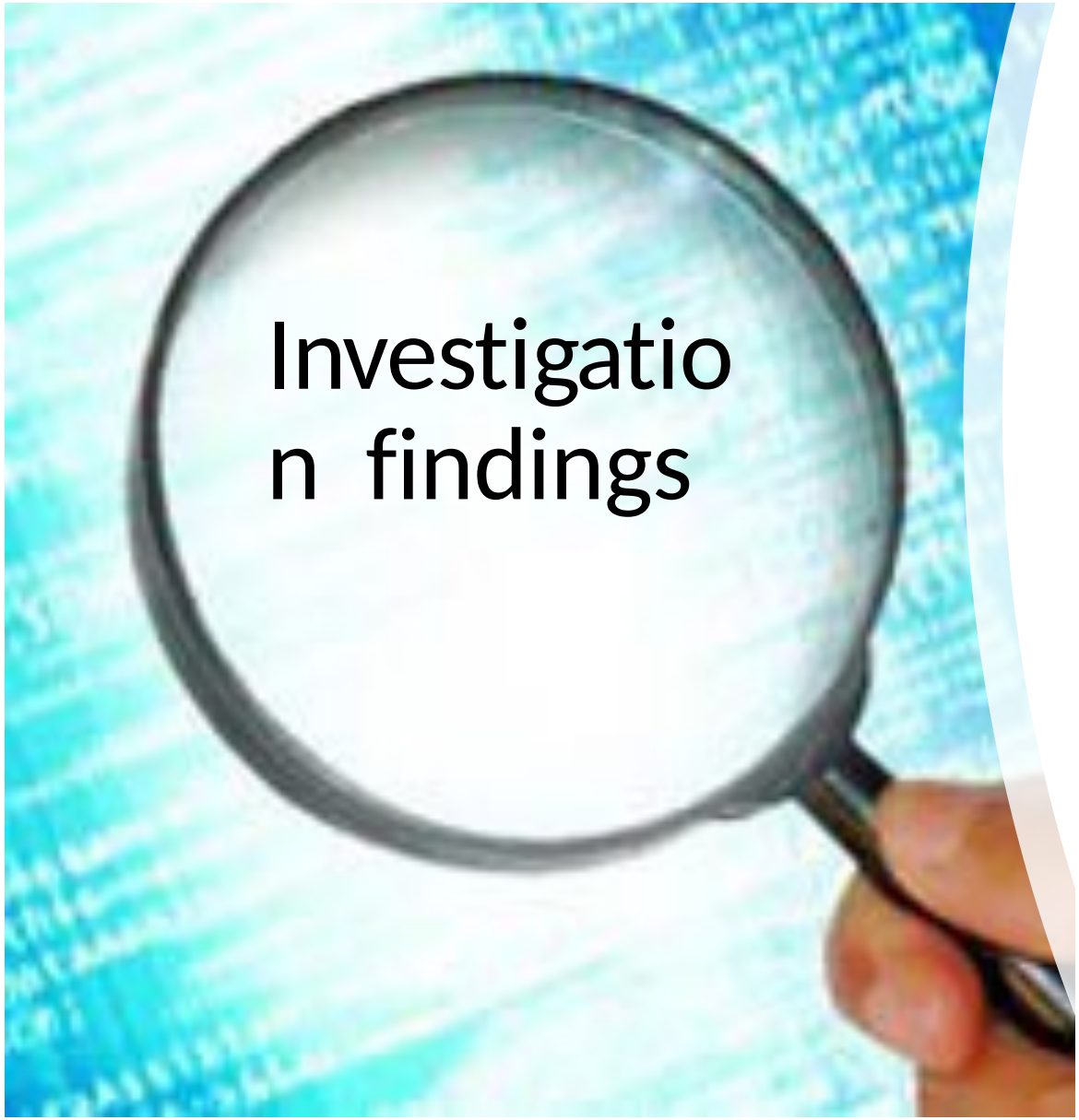
2.North GILOG @ 3900

3.Maintaining 4000

4.Descends to 3300







1.QNH 0987

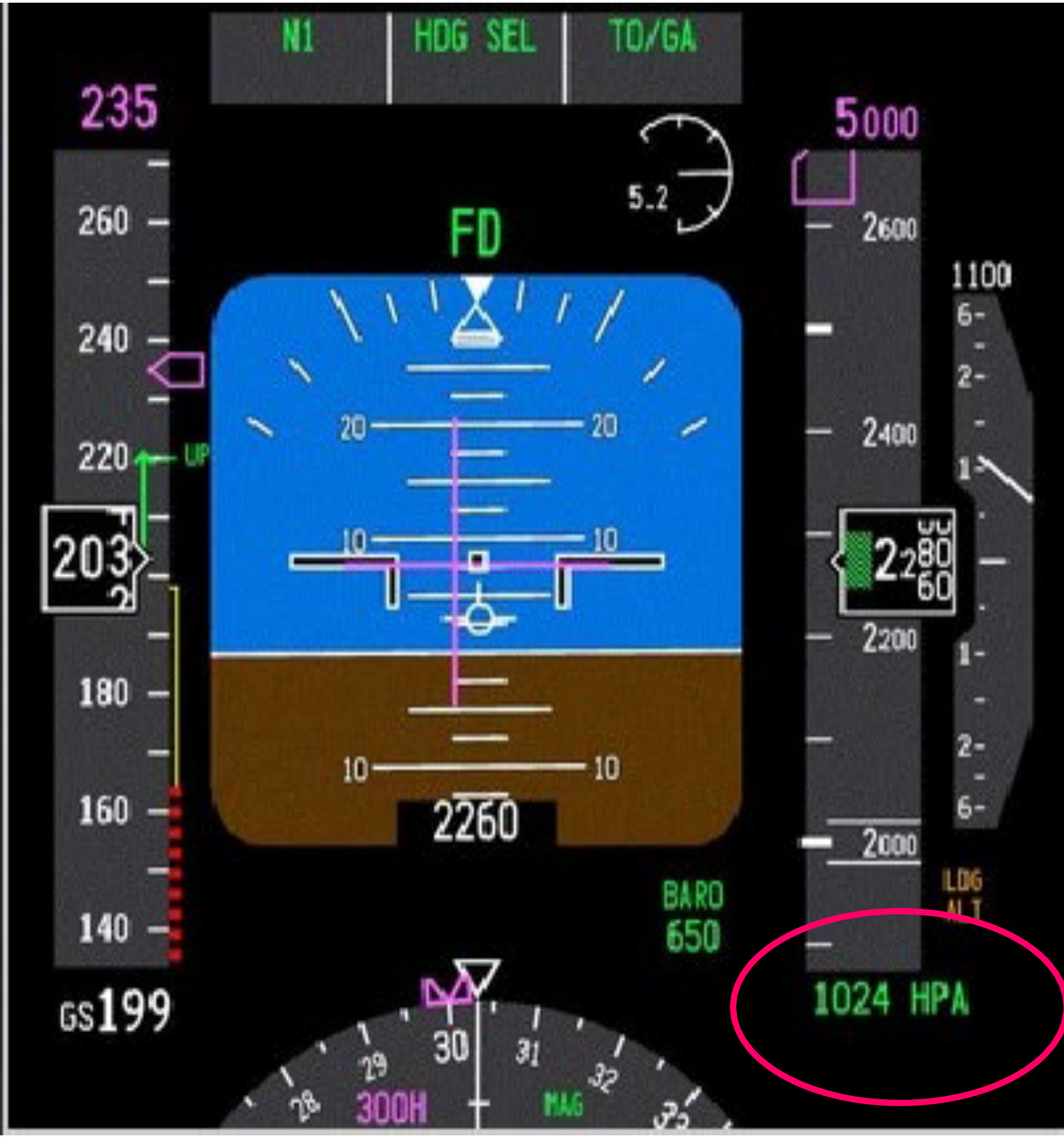
2.Flight Crew Set 29.87 Inches

3.29.87 Inches = 1011HPa

4.1011 – 987 = 24

5.25*30 = 720

6.Altimeter indicates 4000’
but actually at 3300’


SPD
HDG
ALT
250
10000
ILNW/265°
DME ----
FD
3.9
300
280
260
245
220
200
10200
9900
9800
BARO
200
29.82 IN.
0.44
100H
MAG

N1
HDG SEL
TO/GA
235
5000
5.2
FD
260
240
220
203
180
160
140
UP
2600
2400
2200
2000
1100
2260
BARO
650
LDG ALT
1024 HPA
GS199
300H
MAG

How can YOU help

Please spread the word:

- Remember: Shannon is a Level Busts hot spot, so please be vigilant and follow instruction from ATC
- Remember: 'Low Pressure=High Risk'
- Remember: the big difference in Transition Altitude between the US and Ireland (18,000' vs 5,000')
- Remember: HECTOPASCALS not Inches of Mercury
- Thoughts, questions, suggestions??

IAA BREAKING NEWS