


Navigatus.aero

Queenstown *Aviation Wx System*
Update of turbulence analysis / reporting

Telarc. Registered
TM
Quality
ISO 9001


CAA
Aviation Meteorological Service Certificate
This is to certify that
Navigatus Consulting Limited
is authorised to operate the following services:
Information Dissemination
Meteorological Reporting
as defined in the organisation's exposition

This certificate is not transferable, and shall come into force on the 25th day of January 2019 and remain in force until the 25th day of January 2021 unless otherwise suspended or revoked.
Granted this 25th day of January 2019

NAVIGATUS CONSULTING

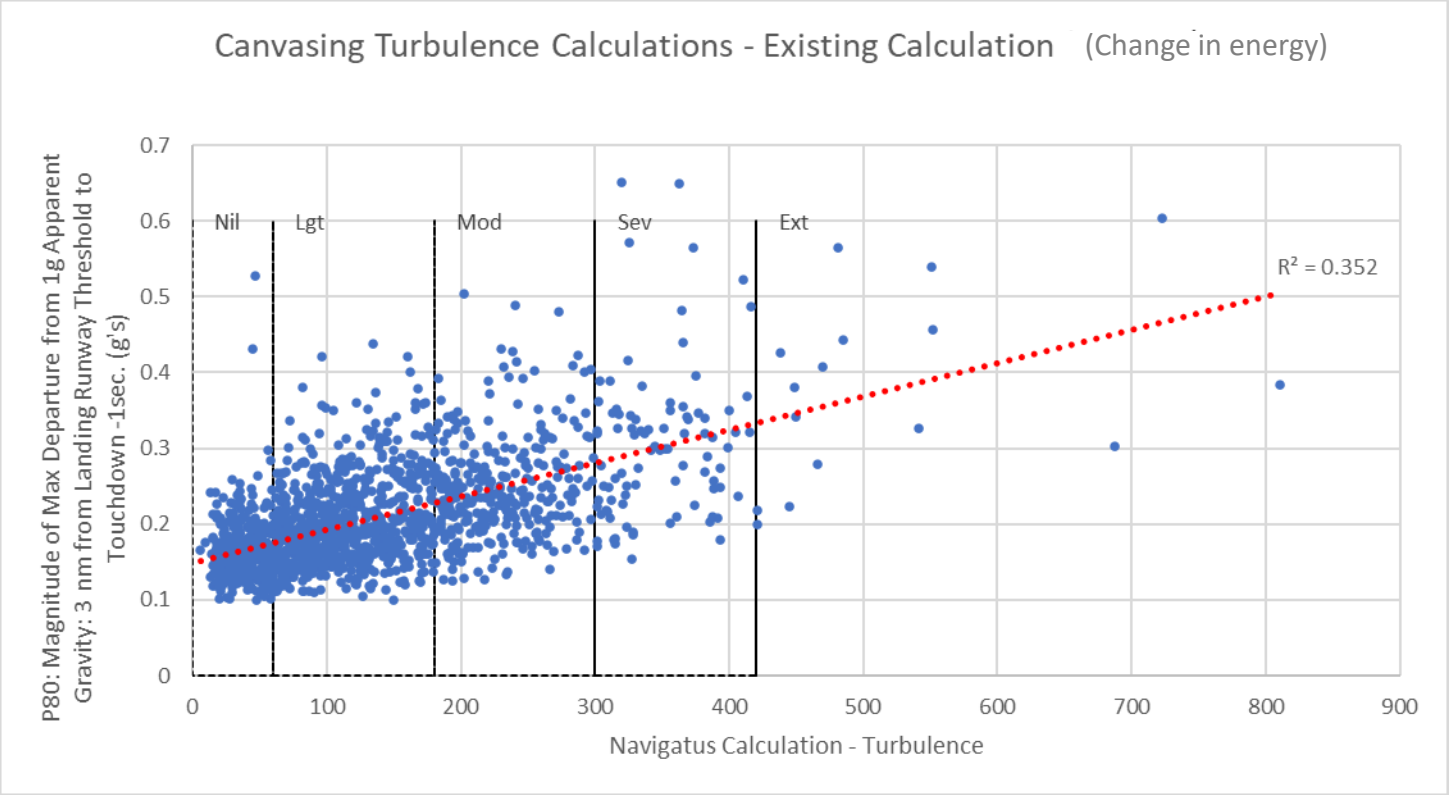
NAVIGATUS AERO

Queenstown Weather reporting system

- A system developed to support RPT jet services at Queenstown Airport.
- Designed to give a rich wind picture – a real-time picture in place of the day-time visual cues (*trees/ grass / dust devils / water / smoke*)
- Practical – user needs focused
- Reports real time (to Tower, Enroute ATS, Flight deck, Ops desk)
  - Actuals (2 minute update for 7 sites)
  - Cross wind component
  - Windshear (Nil, Lgt, Mod,
  - Turbulence (Nil, Lgt, Mod, Sev, Ext)
  - Change (veering/backing, increasing, decreasing)

Approach 23

Original calculation - correlation



Notable range of calculated to force experienced:

- Timing of readings
- Locations read

Alternative approach

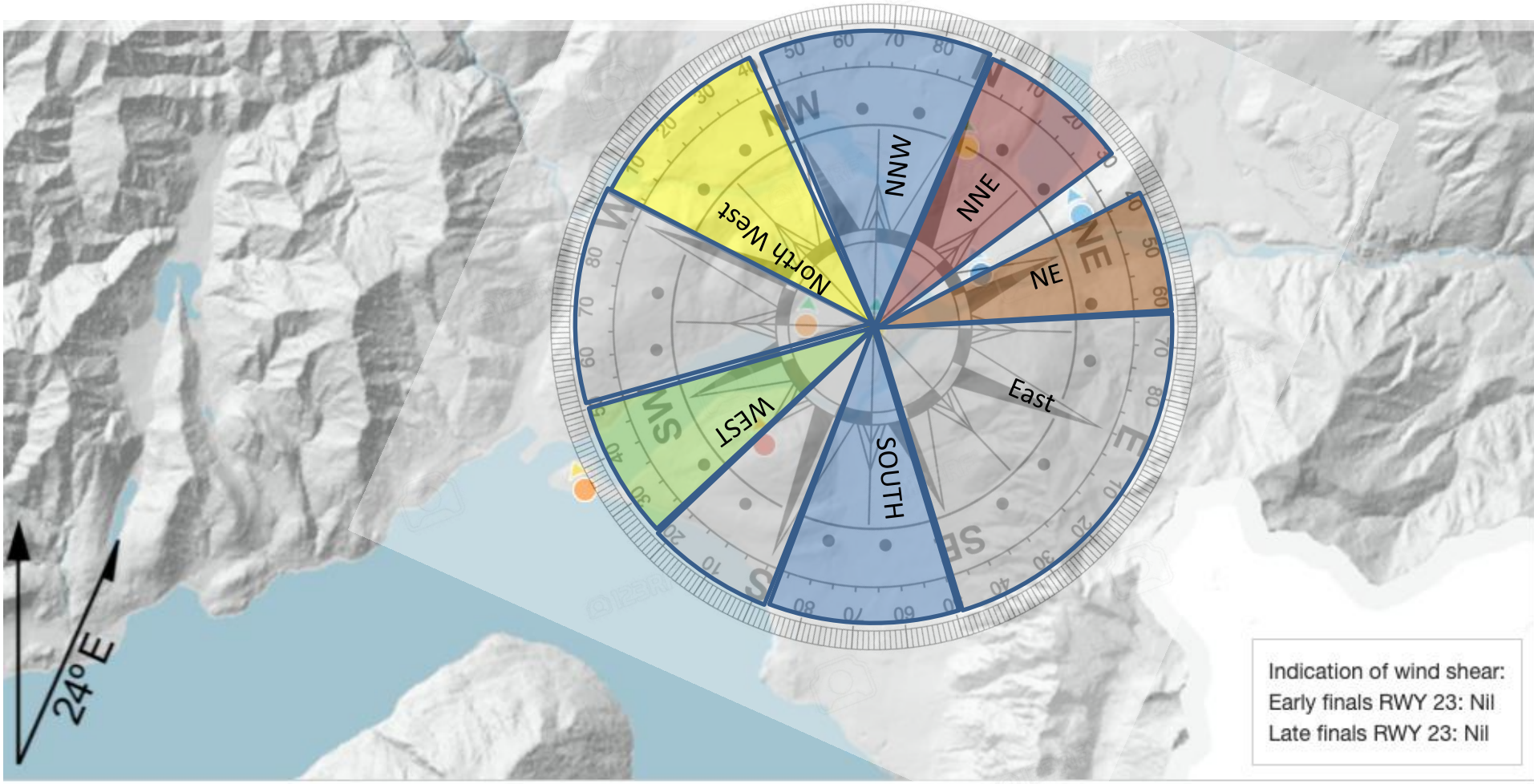
1. Obtained airframe G-force (6 axis) data from airlines (JQ)
2. Correlate airframe forces to:
    1. Calculated turbulence

After considerable effort to design an algorithm that consistently matched force data, determined that variability was too great.

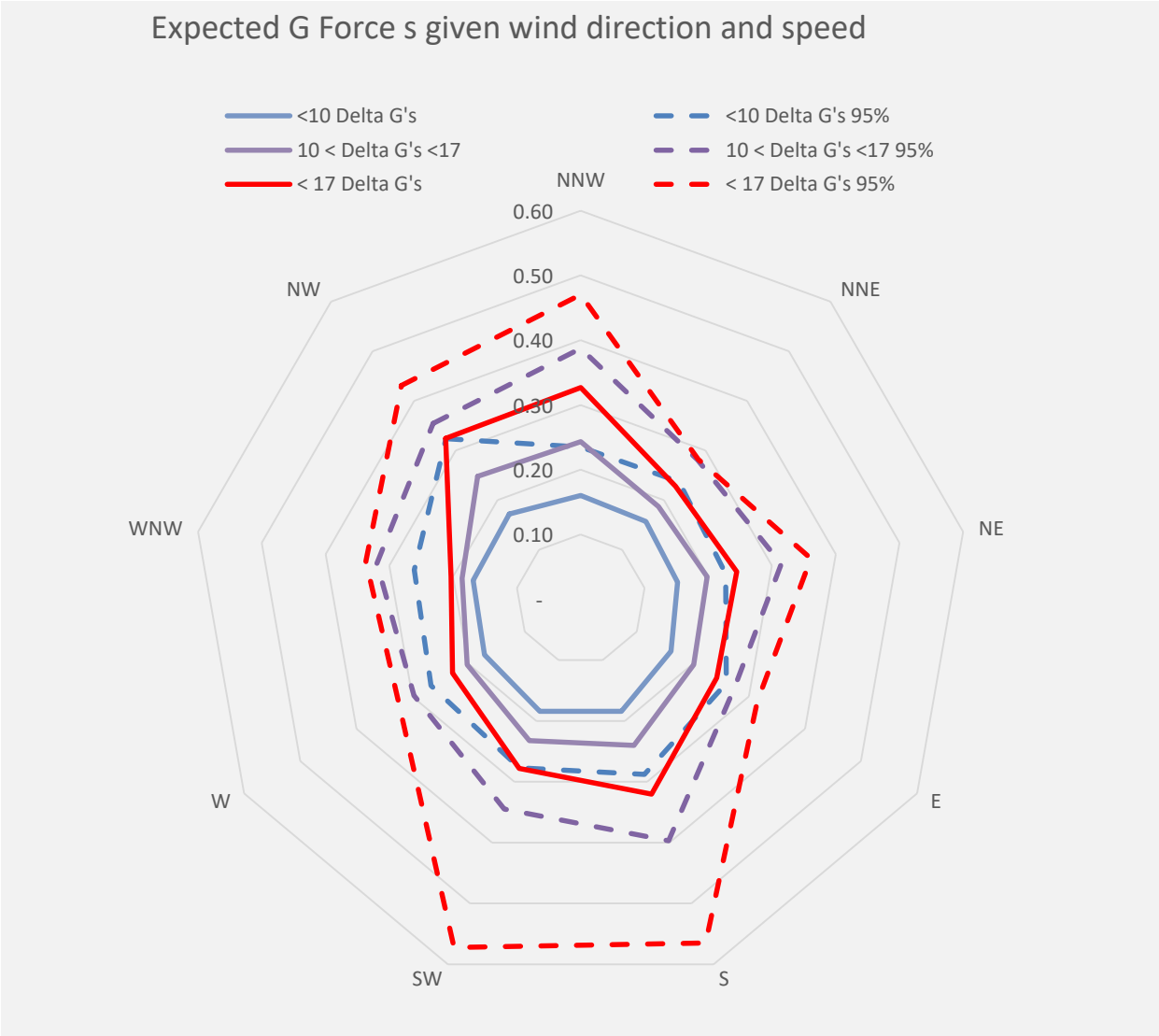
Instead:

1. Matched force data to actual conditions at each nearby wx station and aerodrome sites.
2. ID'ed force patterns referenced to overall low level airflow conditions
3. Determine expected (most probable) level of turbulence based upon G-force data and overall conditions

Alternative approach



Alternative approach



Revised approach

RWY 23 Direction	<10 kts Output	>10 kts, <17 kts Output	17 kts< Output
NNW	NIL	Mod	Sev
NNE	NIL	Lgt	Lgt
NE	NIL	Lgt	Mod
E	NIL	Lgt	Mod
S	Lgt	Mod	Sev
SW	Lgt	Lgt	Mod
W	NIL	Lgt	Lgt
WNW	NIL	Lgt	Lgt
NW	NIL	Mod	Sev

- *In event of TDZ 23 has not reported, TDZ based analysis inserted.*
- *< 5Kts: Light variable conditions (no turbulence output reported)*

Revised approach

Customer-centric (pilot / flight-planner) mind set underpinned all aspects of the design of the service and considerable pilot input was sought and flight-experience calibration time and feedback obtained during development of the system and service.

1. Identical reporting format as before (no change / no human factor issue)
2. Consistent reporting (no reports of notable delta)
3. “expected” turbulence as felt by airframe given conditions within the basin rather than actual calculated at a given station / moment.

NAVIGATUS
AERO

Geraint Bermingham: +64 21 88 44 25