
TDRWP Operational Acceptance Test Plan (2019)

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Background

- Work has been contracted out to upgrade the KSC Tropospheric Doppler Radar Wind Profiler (TDRWP) to improve the Effective Vertical Resolution (EVR) from ~450 m to 300 m while staying out of the Amateur Radio frequencies.
- KSC Weather has asked the Natural Environments (NE) branch to conduct an Operational Acceptance Test (OAT) to verify the EVR is 300 m and that the TDRWP is working as good or better than prior to the upgrade.



OAT Requirements

Requirement	Criteria	Rationale
Time Interval	5 min	Supports DOL timeline.
Vertical Data Interval	150 m	Consistent with database used for SLS design.
Wind Accuracy	1.5 m/s root-mean-square component difference between 1,795 – 19,430 m	Accuracy of heritage balloon and DRWP systems. Altitude range over which TDRWP was certified to prior to upgrades.
Effective Vertical Resolution	300 m	KSC Weather requirement for upgrade to be considered successful.
Data Collection Period	Greater of 60 days or the number of days that yield 30 concurrent balloon and TDRWP profiles	Consistent with prior OAT methodologies that ensures enough data is analyzed to accurately draw conclusions from.



Methodology

- Time interval will be measured as the time it takes to obtain a profile under nominal conditions.
- Vertical interval will be calculated as the size of the maximum range gate.
- Wind accuracy is determined as the Root Mean Square (RMS) component difference between time and height matched TDRWP profiles and Automated Meteorological Profiling System (AMPS) balloons.
 - Result is altitude band where the wind accuracy requirement (1.5 m/s RMS or less) is met.
 - This will be assessed as in the TDRWP full certification in 2018 implementing quality control techniques, accounting for spatial separation error, and rounding the RMS values to nearest 0.1 m/s.
- EVR will be calculated via spectral analysis of TDRWP pairs.



Forward work

- Conduct the OAT analyses as data becomes available.
- Document the results of the analyses and deliver a report to the KSC Weather Office 1 month after data collection period ends.

