



TERMS OF REFERENCE
FOR THE
SUPPLY AND DELIVERY OF ONE THOUSAND FIFTY (1,050) PCS.
RADIOSONDE TRANSMITTERS - VAISALA RS41-SG
With Free Met. Balloons.

A. BACKGROUND

Upper-air soundings complete the required weather parameters in 3 dimensions which are necessary for weather analysis and prediction. Its importance is so great that the equipment used should be of great quality such as the transmitters and weather balloons which measure the different weather parameters up to 12,000 meters above mean sea level and send these data to the receiving stations in the country. The upper-air soundings can be used to deliver real-time data required for local-area weather forecasts such as thunderstorms and rainy days name a few. These can be of additional help in the formulation of the localized weather forecast in the newly formed five (5) PAGASA Regional Services Divisions in NCR, Northern and Southern Luzon, Visayas, and Mindanao.

B. APPROVED BUDGET FOR THE CONTRACT (ABC)

The Approved Budget for the Contract is **Seventeen Million Eight Hundred Fifty Thousand Pesos (Php17,850,000.00)** inclusive of VAT and all applicable government taxes.

C. TECHNICAL SPECIFICATIONS:

The Radiosonde Transmitter **VAISALA RS41-SG with Free Met. Balloons** shall have the following minimum technical specifications:

Unit	Specification
1. TEMPERATURE SENSOR	
Type	: PLATINUM RESISTOR
Range	: -90°C + 60°C
Response Time (63.2%, 6 m/s flow)	
1000 hPa	: <0.5 s
Stability (0.5 years)	: 0.05°C
Resolution	: 0.01°C
Accuracy	:
Repeatability in calibration	: 0.1 °C

Combined uncertainty after ground preparation	: 0.2 °C
Combined uncertainty in sounding <16km	: 0.3 °C
Combined uncertainty in sounding >16 km	: 0.4 °C
Reproducibility in sounding	
>100 hPa	: 0.15 °C
<100 hPa	: 0.30 °C

2. HUMIDITY SENSOR

Type	: <u>THIN-FILM CAPACITOR</u>
Range	: 0 to 100% RH
Resolution	: 0.1% RH
Response Time:	
1000 hPa, 6 m/s, +20°C	: <0.3 s
1000 hPa, 6 m/s, -40°C	: <10 s

Accuracy

Repeatability in calibration	: 2% RH
Combined uncertainty after ground preparation	: 3% RH
Combined uncertainty in sounding	: 4% RH
Reproducibility in sounding	: 2% RH

3. PRESSURE SENSOR

Type	: CALCULATED FROM GPS
Range	: from surface pressure 1.0 hPa to 0.5 hPa
Resolution	: 0.1 hPa
Accuracy	
Combined uncertainty/Reproducibility in sounding	
>100 hPa	: 1.0 hPa / 0.5 hPa
100-10 hPa	: 0.3 hPa/ 0.2 hPa
<10 hPa	: 0.04 hPa / 0.04 hPa

4. GEOPOTENTIAL HEIGHT

Type	: CALCULATED FROM GPS
Range	: From Surface to 40,000 m
Resolution	: 0.1 gpm
Accuracy	
Combined uncertainty in sounding	: 10.0 gpm
Reproducibility in sounding	: 6.0 gpm

5. WIND SPEED

Velocity measuring uncertainty	: 0.15 m/s
Resolution	: 0.1 m/s
Maximum reported wind speed	: 160 m/s

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6. WIND DIRECTION

Directional measurement uncertainty	: 2 deg
Resolution	: 0.1 deg
Wind direction range	: 0 to 360 deg

7. TELEMETRY

Transmitter type	: Synthesized
Tuning range	: 400.156-406.99 MHz
Maximum transmitting range	: up to 350 km
Frequency stability, 90% probability	: ± 2 kHz
Deviation, peak-to-peak	: 4.8 kHz
Emission bandwidth	: According to EN 302 054
Output power (high-power mode)	: 60 mW min
Sideband radiation	: According to EN 302 054
Modulation	: GFSK
Data downlink	: 4800 bit/s
Frequency setting	: Wireless with R141

8. GPS receive (SA Off, PDOP<4)

Number of channels	: ≥ 48
Frequency	: 1575.42 MHz, L1 C/A Code
Cold Start Acquisition Time	: 35 s (nominal)
Reacquisition	: 1 s (nominal)
Correction	: Differential
Reporting resolution of lat. Lon position values	: $\leq 8^\circ$

9. Operational Data

Power up	: Wireless with R141/GC41 or with switch
Factory Calibration	: Stored on Flash Memory
Battery	: 2pcs AA size Lithium cells
Operating Time	: >240 min
Weight	: 109 g
Dimensions	: Body (L x W x H): 145 x 63 x 46 mm
Sensor boom bent (L x W x H)	: 272 x 63 x 104 mm

10. Add-On Sensor Support

Protocol support	: Xdata to connect to several sensors : In the same chain, data transferred either directly or via OIF411 to RS41
Transfer rate	: max 200 bytes/s

11. Unwinder

Material of the string	: non-UV treated polypropylene
Tenacity	: <115N
Length of the string	: 30 m
Unwinding speed	: 0.35 m/s
Weight	: 20

12. METEOROLOGICAL BALLOONS SPECIFICATION:

Weight	: 350 grams Uncolored
Neck Size & Diameter:	: 120±20mm 32±3mm
Brand	: TOTEX (Japan)

13. PACKAGING

Must be individually packed in a hermetically sealed aluminum bag with anti-insect powder inside.

Note: *A certification from the manufacturer must be attached and submitted by the winning bidder/supplier*

D. DELIVERY PERIOD AND PLACE OF DELIVERY

The winning bidder shall supply and deliver the **One Thousand Fifty (1,050) pcs. of Radiosonde Transmitters Vaisala RS-41SG with Free Met Balloons** on-site in the following **PAGASA Stations**: Before delivery transmitters and Met. balloons shall be inspected by the PAGASA and COA inspectors at PAGASA Central Office Science Garden Complex, Senator Miriam P. Defensor-Santiago Ave., Brgy. Central, Quezon City.

Name of Station			Address
1. PAGASA-Legaspi Station	Upper Air	Air	Southern Luzon PRSD, Legaspi, Albay
2. PAGASA-Mactan Station	Upper Air	Air	Visayas PRSD, Mactan, Cebu

Delivery of the total **1,050 pcs. Radiosonde Transmitters – Vaisala RS41-SG** with Met. Balloons shall be made by the following schedule:

1st Tranche: First Week of February 2025	
Name of Station	Qty/Unit
PAGASA-Legaspi Upper Air Station	250 pcs.
PAGASA-Mactan Upper Air Station	0
Sub-Total	250 pcs.

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2nd Tranche: 1st week of June 2025

Name of Station	Qty/Unit
PAGASA-Legaspi Upper Air Station	400 pcs.
PAGASA-Mactan Upper Air Station	400 pcs.
Sub-Total	800 pcs.

Failure to deliver within the prescribed period without valid and justifiable reason shall constitute a delay on the part of the winning bidder/supplier which is a ground for the imposition of liquidated damages by Section 68 and Section 3 (Annex "D") of the Revised IRR of RA 9184.

E. PAYMENT TERMS

The winning bidder/supplier may be allowed to collect partial payment commensurate to the number of goods/items delivered; *provided that*, said deliveries are by the schedule of requirements specified above and subject further to the complete submission of the documentary requirements prescribed under the accounting and auditing rules and regulations.

F. WARRANTIES

1. To assure that manufacturing defects shall be corrected by the winning bidder/supplier, warranty security shall be required from the contract awardee for a minimum period of **one (1) year** after acceptance by PAGASA of the delivered goods/supplies.
2. The obligation for the warranty shall be covered by either retention money in an amount equivalent to at least one percent (1%) of every progress payment, or a special bank guarantee equivalent to at least one percent (1%) of the total contract price. The said amounts shall only be released after the lapse of the warranty period: Provided, however: That the supplies delivered are free from patent and latent defects and all the conditions imposed under the contract have been fully met.
3. The winning bidder likewise warrants that it shall strictly conform to all the Terms and Conditions of this Terms of Reference.