

**TERMS OF REFERENCE
FOR THE
SUPPLY AND DELIVERY OF
ONE THOUSAND FOUR HUNDRED (1400) 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 the purpose of 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 measures 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 a real time data required for local-area weather forecast such as thunderstorm and rainy days-to name a few. These can be of additional help in the formulation of 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 inclusive of VAT and all applicable government taxes is **Twenty Three Million Eight Hundred Thousand Pesos (PhP 23,800,000.00)**.

C. BID PROPOSAL CONTENTS

The prospective bidder is expected to comply and respond accordingly to the specific instructions to bidders and completely submit all the documentary requirements under the Checklist of Eligibility, Technical and Financial Requirements. The submission of documentary requirements must be properly arranged in order and with label. Absence or lack of any of the bidder's documentary submissions shall be a ground for outright rejection of bids.

Furthermore, the prospective bidder is expected to respond "paragraph by paragraph" into this Terms of Reference (TOR); and, shall clearly indicate compliance to the required specifications (*Please see Section VII. Compliance Matrix*) and specify the number of days or schedules within which to complete the delivery of all the goods/services required using the prescribed bidding form. (*Please see Section VI. Schedule of Requirements*).

The prospective bidder is likewise required to include in its proposal, **original descriptive literatures** and/or **unamended brochures** of all equipment/materials to be supplied.

These details will allow the **PAGASA-Bids and Awards Committee** to fully evaluate and determine compliance from the prospective bidders.

D. QUALIFICATIONS OF THE BIDDER

(Please refer to. Instructions to Bidders, the Bid Data Sheet and Checklist of Eligibility and Technical Requirements of the Bidding Documents)

E. TECHNICAL SPECIFICATIONS:

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

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

B. 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 in calibration | : 2% RH |
| Combined uncertainty after ground preparation | : 3% RH |
| Combined uncertainty in sounding | : 4% RH |
| Reproducibility in sounding | : 2% RH |

C. 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

D. 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

E. WIND SPEED

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

F. WIND DIRECTION

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

G. 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

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

Number of channels : ≥ 48
 Frequency : 1575.42 MHz, L.I C/A Code

| | |
|--|------------------|
| Cold Start Acquisition Time | : 35 s (nominal) |
| Reacquisition | : 1 s (nominal) |
| Correction | : Differential |
| Reporting resolution of lat. Lon position values | : $\leq 8^\circ$ |

I. 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 |

J. 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 |

K. 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 |

L. METEOROLOGICAL BALLOONS

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

M. PACKAGING

Must be individually packed with 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*

DELIVERY PERIOD AND PLACE OF DELIVERY

The winning bidder shall supply and deliver the **One Thousand Four Hundred (1,400) pcs. Of Radiosonde Transmitters with Free Met Balloons** on-site in the following **PAGASA Stations**: Prior to delivery transmitters and balloons shall be inspected by the PAGASA and COA inspectors.

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

Delivery of the total **1,400 pcs. Radiosonde Transmitters** shall be made in accordance with the following schedule:

| 1st Tranche: 1st week of January 2019 | |
|--|-----------------|
| Name of Station | Qty/Unit |
| PAGASA-Legaspi Upper Air Station | 175 pcs. |
| PAGASA-Mactan Upper Air Station | 175 pcs. |
| Sub-Total | 350 pcs. |

| 2nd Tranche: 1st week of April 2019 | |
|--|-----------------|
| Name of Station | Qty/Unit |
| PAGASA-Legaspi Upper Air Station | 175 pcs. |
| PAGASA-Mactan Upper Air Station | 175 pcs. |
| Sub-Total | 350 pcs. |

| 3rd Tranche: 1st week of July 2019 | |
|---|-----------------|
| Name of Station | Qty/Unit |
| PAGASA-Legaspi Upper Air Station | 175 pcs. |
| PAGASA-Mactan Upper Air Station | 175 pcs. |
| Sub-Total | 350 pcs. |

| 4th Tranche: 1st week of October 2019 | |
|--|-----------------|
| Name of Station | Qty/Unit |
| PAGASA-Legaspi Upper Air Station | 175 pcs. |
| PAGASA-Mactan Upper Air Station | 175 pcs. |
| Sub-Total | 350 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 in accordance with Section 68 and Section 3 (Annex "D") of the Revised IRR of RA 9184.

F. PAYMENT TERMS

The winning bidder/supplier may be allowed to collect partial payment commensurate to the amount of goods/items delivered; *provided that*, said deliveries are in accordance with 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.

G. PERFORMANCE SECURITY

The winning bidder/supplier shall post the required Performance Security in accordance with Section 39 of the Revised Implementing Rules and Regulations (IRR) of RA 9184. The amount of the Performance Security shall be equivalent to the total contract cost of the Project which shall be denominated in Philippine Peso and payable to PAGASA.

H. WARRANTIES

1. In order to assure that manufacturing defects shall be corrected by the winning bidder/supplier, a 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.