RFP GP 600187 - Clarifications to Bidders III

A. Technical Questions:

1. The RFP requires at 5.1.5 that convective storm precipitation be predicted by LDN rather than direct observation. We intend to place stations at very high density so that we can observe this rainfall directly. We cannot understand why an inferred guesstimate of this important emergency-related parameter would be employed rather than the preferred approach of simply measuring rainfall directly.

   ANSWER: It is seldom practical to deploy stations that directly observe rainfall at a sufficient density to obtain rainfall data at the scales necessary for hydromet monitoring and forecasting. This is especially the case for precipitation from evolving, moving convective storms. Further, it is anticipated that the UNDP projects accessing the LTA(s) that result from this RFP would define the number of observation points for direct precipitation monitoring, and might therefore limit the ability of the proposer to deploy a sufficiently dense network of direct observation points for precipitation monitoring. However, as long as a proposer's primary proposal is compliant with the methodologies that use remotely sensed lightning data to infer convective precipitation, alternative proposals would be accepted per Section 2, C.20.

2. The RFP requires that the LDN have a spacing of 9 stations per 250,000 km^2**,** see items 1.1.5 and 1.1.6 in the RFP). If we can provide the same or better performance than is required with just 3 LD systems in our LDN would that be a problem? Or, suppose that we have a more robust solution that has detection embedded in every stations on a 50 km spacing, thereby giving higher quality data for a lower cost? Is that not acceptable. We have difficulty understanding why the UNDP specifies the specific spacing of lightning sensors rather than the system performance, given the broad sweep of technologies in this domain, and specifically, since your specifications might appear to limit the options to one system?

   ANSWER: The RFP requires that a MINIMUM of nine sensors be used to meet the system performance criteria as specified in Section C.b.1, but more specifically numbers 1.1.3.1, 1.1.3.2, and 1.1.3.3, for a 250,000 km^2 area. Therefore, the RFP is based on the need for the system to comply with system performance metrics. However, proposers may recommend more sensors be deployed to meet these specifications based on the performance of their LDN system.

   While nine sensors may be more than is technically required to meet these performance characteristics, that number was chosen in order to ensure sufficient redundancy for operational purposes in case of power or telecommunications outage, theft, or physical

damage in a challenging operational environment, as well as to provide a common basis for sensor and system cost comparison.

3. The RFP calls out certain sensors to be acceptable to be put on their outside the one-piece station, whereas others are not allowed, with no apparent connection to any meteorological motivation. Of course, existing one-piece stations have specific sensors included, any of which may not absolutely satisfy your requirements. So by specifying which sensors are allowed to be put on externally (e.g., the tipping bucket rain-gauge and pyranometer, but not the lightning sensor or pyrgeometer) you implicitly identify which one-piece sensor system is acceptable. Wouldn't it be fairer to specify that all but two sensors should be part of the one-piece station?
   ANSWER: Proposers may offer all-in-one weather station alternatives for the CCN that include all sensor types, ranges, and accuracies from Section C.a.1.1 as long as no more than 2 sensors are not included in the all-in-one package and the only sensor that may have any moving parts is the precipitation sensor.

4. You require the vendor to be able to report if and when lightning was between clouds or hitting the ground: Although it is important to detect both in-cloud lightning and cloud-to-ground events, we can detect no scientific basis or additional functionality attained by distinguishing the two in this context, although one vendor takes pride in providing these data. Without scientific justification, I think this acts as an arbitrary specification that unduly limits the products that could satisfy the needed lightning detection. Can we stick to scientific basis, and simply indicate that lightning should be detected with the specified probabilities?
   ANSWER: Lightning events, whether CG or IC, are a strong indication and a skillful predictor that severe weather is developing within a convective storm system. Recent studies have demonstrated that, among other phenomena, the IC flash rate is well correlated with storm cell growth. This RFP requires a lightning detection system that has the capacity to discriminate between CG and IC events in order to align with these recent research findings and maximize operational value to the NMHSs.

   Moreover, it is generally estimated that the ratio of CG:IC events, globally, is on the order of 1:3 while this ratio increases to as much as 1:9 in tropical climate zones. Therefore, requiring the same detection efficiencies for all lightning events would either inappropriately loosen the requirement for CG lightning events or tighten the requirement for IC events.

   The requirements within the RFP are consistent with the state of the science by indicating that the lightning detection systems shall discriminate between CG and IC lightning events and that all suppliers should be able to provide systems that comply with the detection efficiencies (probabilities) indicated in Sections C.b.1.1.3.1 and C.b.1.1.3.2.

5. It is commonly known that an average lightning strike is about 8 km long, how can the location be determined within 500m as is required? It is equivalent to requiring an instrument to specify where a car is to within a decimeter by a single set of coordinates: a car spans many meters, so it does not reside within a few decimeters. This does not seem logical or reasonable.
ANSWER: Lightning detection networks are used to locate lightning events. Location Accuracy (or Location Error), as defined in the WMO CIMO Guide Chapter 7: Electromagnetic Methods of Lightning Detection, is used as one metric for determining performance for these systems. The Location Accuracy (or Location Error) of a lightning detection system can be determined by comparing the estimated location of a cloud to ground lightning stroke as determined by an LDN to known cases of lightning strokes that have reached the ground.

Section C.b.1.1.3.3 incorrectly requests that Location Accuracy also be given for IC Flashes, and should therefore be modified to read as follows:

> *Location Accuracy of CG lightning shall be an average of 500 meters or less. Methodologies used to arrive at the Location Accuracy should be described and verified through ground truth case studies supplied in proposer's response.*

6. Why is it that in section 2.4 of the RFP the statistically unsound approach to derive rainfall estimates on the basis of simulated radar reflectivity is required? Rainfall (drop size distribution and volumetric rain content) determine radar reflection, radar reflection does not determine rainfall. In fact, many assumptions underlie rainfall estimates from radar reflectivity. One does also not derive rainfall from lack of sunshine. Much better ways of estimating total rainfall in convective storms exist, given the system that being built here, such as GPS-based precipitable water vapor estimates, combined with NWP.
ANSWER: Data sets from other non-radar sources, such as GPS-based precipitable water vapour estimates, surface observations, satellite observations, NWP, etc may be used to verify the rainfall estimates generated by the LDN DMS for the radar simulation product described in section 2.4.

7. Can you confirm that the air temperature sensor accuracy is 0.3 °C which is not compliant to WMO standard (+/- 0.2 °C)? See Page 48 (I.1–32) from Guide to Meteorological Instruments and Methods of Observation 2008 edition, updated in 2010.
 ANSWER: Yes, the required air temperature sensor accuracy is +/- 0.3 °C as stated in Section C.a.1.1.1.

8. Can you confirm that the air temperature and air humidity should be measured at 10 meters which is not compliant to WMO standard (1.2 m to 2m)?
ANSWER: The air temperature and air humidity sensors, which are required to be integrated into an all-in-one package of sensors as stated in Section C.a.1.2, will may be installed at heights between 1 and 10 meters AGL. Installation height for this sensor package will be determined by

local conditions and observational needs, with the implementing agency (NMHS or other) making the final decision.

9. Could you define the ISO Class 9060:1990 for the pyranometer (second class, First class, secondary standard)? See page 186 (I.7-12) from Guide to Meteorological Instruments and Methods of Observation 2008 edition, updated in 2010 and from International Organization for Standardization, 1990a: Solar Energy – Specification and Classification of Instruments for Measuring Hemispherical Solar and Direct Solar Radiation. ISO 9060.
    ANSWER: The minimum specifications for the pyranometer are as indicated in Section C.a.1.1.6., a modified in Clarifications II. Proposers are welcome to provide pyranometers of a higher performance/quality. It should be noted that the potential applications for this instrument are for agricultural meteorology as per the guidelines in WMO No. 134. Guide to Agricultural Meteorological Practices

10. Section 3, Current Conditions Network:
    2.1.3.7. "For roof and tower installations: height of structure, height of sensor shelter relative to structure, and height of anemometer relative to structure"
    This leads us to believe that the anemometer does not have to be part of the all-in-one unit defined in Item 1.2. Could you please clarify this?
    ANSWER: The RFP states in section C.a.1.2 that the anemometer is one of the sensors that should be included as part of the all-in-one unit. However, additional guidance has been given in the answer to question 3 above that may modify this requirement for some proposers.

11. Section 3, Current Conditions Network:
    2.1.4. "The CCDMS has sufficient storage capacity to record data observations at fifteen (15) minute intervals from all AWS sites for at least ten (10) years."
    Would 10-minute intervals also be acceptable?
    ANSWER: Yes.

12. Section 3, Severe Weather Nowcasting Network:
    2.3.2. "The LDN DMS clusters raw lightning data into storm cells with defined boundaries at one-minute intervals, with no less than one-minute latency."
    Latency has to be more than 1 minute?
    ANSWER: This requirement should be modified to read:
    > *"The LDN DMS clusters raw lightning data into storm cells with defined boundaries at one-minute intervals, with no greater than two-minute latency."*

13. 2.3.7. "The Severe Weather Warnings are automated and provide advanced warning on the potential for severe weather such as frequent lightning, hail, heavy rainfall, wind gusts, and other types of severe weather."
    Could you mention some examples of 'other types of severe weather'?

ANSWER: Gust Front/Outflow Boundary; Downbursts.

14. Section 3, Weather Forecasting Solution:
    1. "The WFS produces forecasts for up to 500 cities, towns, districts and villages"
    We assume that the new network of 30 stations combined with the existing NMHS network does not add up to 500 stations for which MOS forecasts could be calculated. For the cities, towns, districts and villages that do not have a weather station in the vicinity, we would provide forecasts based on other sources and techniques. Is this the desired approach?
    ANSWER: Yes.

15. Section 3, Weather Forecasting Solution:
    2.18. "Ice Probability"
    Does that mean probability of freezing rain?
    ANSWER: Yes

16. Section 3, Weather Forecasting Solution:
    The forecast grid resolution size shall be no greater than 12.5 km.
    Does this refer to the model that is used for the MOS forecasts and other forecasts for up to 500 cities/towns/districts/villages? If it refers to forecasts that should be made available to the NMHS in grid format, please clarify or help us find the part of the TOR where this is defined.
    ANSWER: This refers to the model that is used by the provider to produce the MOS forecasts and other forecasts for up to 500 cities/towns/districts/villages.

17. P. 30 1.4.3 section 3: Power source for AWS: 'AWS DCTU shall have the capacity to automatically switch back and forth between the primary power source and the on board battery backup power source.' Please confirm that primary power source is the electricity network already available at the site? Please confirm that the secondary on board battery back-up power source means the supply of an additional photovoltaic panel and battery?

    ANSWER: If installed at a location where power from the grid is provided, for example at mobile telecommunication towers or other similar facilities, the AWS DCTU shall use that power as its "primary power source". If installed at a location where power from the grid is NOT provided, the AWS DCTU shall use power from a photovoltaic panel or another local power source as its "primary power source". The "on board battery backup power source" refers to a battery backup that will provide an alternative source of power to the AWS DCTU when its "primary power source" fails. The AWS DCTU shall have the capacity to switch back and forth between primary and backup power sources automatically, i.e., without any human operator intervention.

18. P 48. F.1. section 3: EWS Operation and Maintenance Service on site hosting agreement – Please confirm that UNDP will supply all the hosting agreements in order to use the cell

tower as installation site and/or any other place in Zambia. That means the bidder is allowed to work on in the place detected?

ANSWER: Proposers are expected to have the capacity to provide and establish hosting agreements with mobile tower operators or other installation sites. However, for some projects, the implementing agency such as the NMHS or other government organization, may choose to provide this service and capacity. Proposers should delineate any projected cost differences expected under these two different circumstances.

19. P. 32: 2.3.1. & 2.3.4. section 3: CCDMS may be delivered in one of the following two ways … : for the IT system installed at the NHMS, what kind of facilities will be provided (conditioning, power supply, auxiliary power supply)? Or do we have to provide these?

    ANSWER: For the IT system installed at the NMHS, the proposer should assume that all air conditioning, power, and auxiliary power for the computer room would be provided by the project and/or the NMHS.

B. Administrative/ Procurement Questions:

20. 'Total DAP ZAMBIA' – Please specify exact final destination?
    ANSWER: Please quote for DAP Lusaka, Zambia

21. Referring to Addendum 1 about deadline postponed – please specify the date for the latest expected date for commencement of contract?
    ANSWER: The expected date remains the same.

22. Section 2; Datasheet
    DS 22; Footnote 6: PDF documents - Is it sufficient to use "a-trust" as a digital signing solution to ensure integrity when submitting PDF files?
    ANSWER: Yes