

**REQUEST FOR PROPOSALS**

**FEASIBILITY STUDY FOR THE**

**EXPANSION OF METEOROLOGICAL SERVICES IN GHANA**

Submission Deadline: **4:00 P.M.**

**LOCAL TIME**

**JULY 17, 2009**

Submission Place: DIRECTOR GENERAL  
GHANA METEOROLOGICAL AGENCY  
P.O. BOX L87  
LEGON, ACCRA  
GHANA

PHONE: +233 243 658 291

FAX: +233 217 012 519

SEALED PROPOSALS SHALL BE CLEARLY MARKED AND RECEIVED PRIOR TO THE TIME AND DATE SPECIFIED ABOVE. PROPOSALS RECEIVED AFTER SAID TIME AND DATE WILL NOT BE ACCEPTED OR CONSIDERED.

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## **Section 1: INTRODUCTION**

The U.S. Trade and Development Agency (USTDA) has provided a grant to the Grantee, the Ghana Meteorological Agency (GMet). The Grant Agreement is attached at Annex 4 for reference. The Grantee is soliciting technical proposals from qualified U.S. firms to provide expert consulting services to carry out the Feasibility Study.

### **1.1 BACKGROUND SUMMARY**

Meteorological services in Ghana are provided by the Ghana Meteorological Agency. The radar located at Kotoka International Airport is operated by GCAA and is used for Air Traffic Control only. The airports are limited in number, and their reports are prepared and disseminated manually. This creates a safety issue for aviation users that do not have access to state of the art meteorological services to warn of approaching storms, which can be severe, or to detect the wind shear conditions at the airports that are common during severe storms.

The Grantee seeks to enhance its ability to produce timely forecasts and to disseminate either short or long term weather forecasts in an efficient manner. The expansion of the Grantee's meteorological services will: (a) equip all airports and other major meteorological stations with automated weather observation stations (AWOS) or radar surveillance; (b) input data collected into an automated meteorology database based on Geographic Information Systems (GIS) technology; and (c) communicate meteorological information and weather forecasts efficiently to aviation, agricultural, energy producing, water resource and industrial users. The Project will also establish a central Weather Forecast Office and enhance forecasting by the use of satellite and ground receiving and imaging systems.

A background Definitional Mission report is provided for reference in Annex 2.

### **1.2 OBJECTIVE**

This Study is intended to (a) assess the hardware, software, and facilities requirements needed by the Grantee over the next 15 years to enable it to provide state-of-the-art weather forecasts and other meteorological services and (b) recommend changes to its organizational structure to optimize the analysis and dissemination of meteorological information.

The Terms of Reference (TOR) for this Feasibility Study is attached as Annex 5.

### **1.3 PROPOSALS TO BE SUBMITTED**

Technical proposals are solicited from interested and qualified U.S. firms. The administrative and technical requirements as detailed throughout the Request for Proposals (RFP) will apply. Specific proposal format and content requirements are detailed in Section 3.

COST will not be a factor in the evaluation and therefore, cost proposals should not be submitted; upon detailed evaluation of technical proposals, one firm will be selected for contract negotiations. The amount for the negotiated contract has been established by a USTDA grant of U.S. \$235,000 dollars.

#### **1.4 CONTRACT FUNDED BY USTDA**

The negotiated contract will be funded by USTDA in accordance with the terms and conditions of its grant to the Grantee. The contract must include certain USTDA mandatory clauses relating to nationality, taxes, payment, reporting, and other matters. The USTDA nationality requirements and the USTDA mandatory clauses are attached at Annexes 3 and 4 for reference.

### **Section 2: INSTRUCTIONS TO PROPOSERS**

#### **2.1 PROJECT TITLE**

The project is called "Expansion of Meteorological Services."

#### **2.2 DEFINITIONS**

Please note the following definitions of terms as used in this RFP.

The term "Request for Proposals" means this solicitation of a formal technical proposal including qualifications statement.

The term "Offeror" means the U.S. individual, or U.S. firm, including any and all subcontractors, which responds to the RFP and submits a formal proposal and which may or may not be successful in being awarded this procurement.

#### **2.3 DEFINITIONAL MISSION REPORT**

USTDA sponsored a Definitional Mission to address technical, financial, sociopolitical, environmental and other aspects of the proposed project. A copy of the Report is attached at Annex 2 for background information only.

#### **2.4 EXAMINATION OF DOCUMENTS**

Offerors should carefully examine this RFP. It will be assumed that Offerors have done such inspection and that through examinations, inquiries and investigation they have become familiarized with local conditions and the nature of problems to be solved during the execution of the Feasibility Study.

Offerors shall address all items as specified in this RFP. Failure to adhere to this format may disqualify an Offeror from further consideration.

Submission of a proposal shall constitute evidence that the Offeror has made all the above mentioned examinations and investigations, and is free of any uncertainty with respect to conditions which would affect the execution, and completion of the Feasibility Study.

## **2.5 PROJECT FUNDING SOURCE**

The Feasibility Study will be funded under a grant from USTDA. The total amount of the grant is not to exceed U.S. \$235,000.

## **2.6 RESPONSIBILITY FOR COSTS**

Offeror shall be fully responsible for all costs incurred in the development and submission of the proposal or any other cost incurred by Offeror prior to issuance of an agreement or contract. Neither USTDA nor the Grantee assumes any contractual obligation as a result of the issuance of this proposal request, the preparation or submission of a proposal by an Offeror, the evaluation of proposals, or final selection.

## **2.7 TAXES**

Offerors should submit proposals which note that in Annex 4, USTDA Mandatory Contract Provisions, USTDA funds are not to be used to pay taxes or duties under the laws of host country.

## **2.8 CONFIDENTIALITY**

The Grantee will use its best efforts to preserve the confidentiality of any business proprietary or confidential information submitted by the Offeror, which is clearly designated as such by the Offeror.

## **2.9 ECONOMY OF PROPOSALS**

Proposal documents should be prepared simply and economically, providing a comprehensive and concise description of the Offeror's capabilities to satisfy the requirements of the RFP. There is no necessity for expensive bindings, colored displays, or other promotional material unless such material is absolutely pertinent to the proposal. Emphasis should be placed on completeness and clarity of content.

## **2.10 SUBSTANTIVE PROPOSALS**

The Offeror shall certify (a) that its proposal is genuine and is not made in the interest of, or on the behalf of, any undisclosed person, firm, or corporation, and is not submitted in conformity with, and agreement of, any undisclosed group, association, organization, or corporation; (b) that it has not directly or indirectly induced or solicited any other Offeror to put in a false proposal; (c) that it has not solicited or induced any other person, firm, or corporation to refrain from

submitting a proposal; and (d) that it has not sought by collusion to obtain for himself any advantage over any other Offeror or over the Grantee or USTDA or any employee thereof.

## **2.11 CONDITIONS REQUIRED FOR PARTICIPATION**

Only U.S. firms are eligible to participate in this tender. However, U.S. firms may utilize subcontractors from host country for up to 20 percent of the amount of the USTDA grant. USTDA nationality requirements are detailed in Annex 3.

## **2.12 LANGUAGE OF PROPOSAL**

All proposal documents shall be prepared and submitted in English, and only English.

## **2.13 PROPOSAL SUBMISSION REQUIREMENTS**

The **Cover Letter** in the proposal must be addressed to:

**Michael Tanu  
Director General  
Ghana Meteorological Agency  
P.O. Box L87  
Legon, Accra  
Ghana**

**Phone: +233 243 658 291**

**An Original and eight (8) copies of your proposal must be received at the above address no later than 4:00 p.m. local time, on July 17, 2009.**

Proposals may be either sent by mail, overnight courier, or hand-delivered. Whether the proposal is sent by mail, courier or hand-delivered, the Offeror shall be responsible for actual delivery of the proposal to the above address before the deadline. Any proposal received after the deadline will be returned unopened.

Upon timely receipt, all proposals become the property of the Grantee.

## **2.14 PACKAGING**

Each proposal must be sealed to ensure confidentiality of the information. The proposals should be individually wrapped and sealed, and labeled for content including "original" or "copy number x"; the original and eight (8) copies should be collectively wrapped and sealed, and clearly marked for content.

Neither USTDA nor the Grantee will be responsible for premature opening of proposals not properly labeled.

## **2.15 AUTHORIZED SIGNATURE**

The proposal must contain the signature of a duly authorized officer or agent of the Offeror empowered with the right to bind the Offeror.

## **2.16 EFFECTIVE PERIOD OF PROPOSAL**

The proposal shall be binding upon the Offeror for sixty (60) days after the proposal due date, and Offeror may withdraw or modify this proposal at any time prior to the due date upon written request, signed in the same manner and by the same person who signed the original proposal.

## **2.17 EXCEPTIONS**

Firms agree by their response to the RFP announcement to abide by the procedures set forth therein. Material modifications in the TOR or responsibilities of the parties will not be accepted.

Any exceptions in the proposal shall be clearly identified, and shall include the scope of such exception, and its impact, on the procurement. The Grantee shall make final determination as to the responsiveness of such exceptions and their acceptability.

## **2.18 OFFEROR QUALIFICATIONS**

As provided in Section 3, Offerors shall submit evidence that they have relevant past experience and have previously delivered advisory and Feasibility Study services similar to those required in the TOR.

## **2.19 RIGHT TO REJECT PROPOSALS**

The Grantee reserves the right to reject any and all proposals and to accept or reject any or all of the items in the proposal, and to award the contract in whole or in part if it is deemed in the best interest of the Grantee.

## **2.20 PRIME CONTRACTOR RESPONSIBILITY**

Offerors have the option of subcontracting parts of the services they propose. The Offeror's proposal must include a description of any anticipated subcontracting arrangements, including the name, address, and qualifications of consultants and subcontractors. USTDA nationality provisions are set forth in detail in Annex 3. The successful Offeror shall cause appropriate provisions of its contract, including all mandatory USTDA clauses, to be inserted in all subcontracts ensuing to ensure fulfillment of all contractual provisions by subcontractors.

## **2.21 AWARD**

An award resulting from this RFP shall be made to the best qualified Offeror, taking into consideration the evaluation factors set forth herein; however, the right is reserved to reject any and all proposals received and, in all cases, the Grantee will be the judge as to whether a proposal has or has not satisfactorily met the requirements of this RFP.

## **2.22 COMPLETE SERVICES**

The successful Offeror shall be required to (a) furnish all supplies, supervision, transportation, and other execution accessories, services, and facilities; (b) provide and perform all necessary labor; and (c) in accordance with good technical practice, with due diligence, and in accordance with the requirements, stipulations, provisions and conditions of this RFP and the resultant contract, execute and complete all specified work to the satisfaction of the Grantee.

## **2.23 INVOICING AND PAYMENT**

Deliverables under the contract shall be delivered on a schedule to be agreed upon in a contract with the Grantee. The Contractor may submit invoices to the designated Grantee Project Director in accordance with a schedule to be negotiated and included in the contract. Upon approval of each invoice, the Grantee will forward the invoice to USTDA which will process payment to the Contractor. All payments by USTDA under the Grant Agreement will be made in U.S. currency.

### **Section 3: PROPOSAL FORMAT AND CONTENT**

To expedite proposal review and evaluation, and to assure that each proposal receives the same orderly review, all proposals must follow the format described in this section.

Proposal sections and pages shall be appropriately numbered and the proposal shall include a Table of Contents. Offerors are encouraged to submit concise and clear responses to the RFP. Proposals shall contain all elements of information requested without exception. Instructions regarding the required scope and content are given in this section. The Grantee reserves the right to include any part of the selected proposal in the final contract.

The proposal shall consist of a technical proposal only. No cost proposal is required as the value of the USTDA grant is established at U.S. \$dollars.

Offerors shall submit one (1) original and eight (8) copies of the proposal. Proposals received by fax cannot be accepted.

The following sections and content are required for each proposal:

Transmittal Letter,  
Cover/Title Page,

Table of Contents,  
Introduction and Executive Summary,  
Company Information,  
Organizational Structure, Management Plan, and Key Personnel,  
Technical Approach and Work Plan,  
Experience and Qualifications, and  
Miscellaneous.

Detailed requirements and directions for the preparation of each section are presented below.

### **3.1 SECTION 1: INTRODUCTION AND EXECUTIVE SUMMARY**

An Executive Summary should be prepared describing the major facts or features of the proposal, including any conclusions, assumptions, and generalized recommendations the Offeror desires to make. Offerors are requested to make every effort to limit the length of the Executive Summary to no more than five (5) pages.

### **3.2 SECTION 2: COMPANY INFORMATION**

#### **3.2.1 Company Profile**

Provide the information listed below relative to the Offeror's firm. If the Offeror is proposing to subcontract some of the proposed work to another firm(s), similar information must be provided for each subcontractor. Offerors are requested to limit the length of the Company Profile Information to one (1) page per firm.

1. Name of firm and business address, including telephone and fax numbers.
2. Year established (include former firm names and year established, if applicable).
3. Type of ownership and parent company, if any.
4. Project Manager's name, address, telephone and fax number, if different from (1).

#### **3.2.2 Offeror's Authorized Negotiator**

Provide name, title, address, telephone and fax number of the Offeror's authorized negotiator. The person cited shall be empowered to make binding commitments for the Offeror and its subcontractors, if any.

#### **3.2.3 Negotiation Prerequisites**

1. Discuss any impact of any current or anticipated commitments which may impact the ability of the Offeror or its subcontractors to complete the Feasibility Study as proposed and within the project schedule.

2. Identify any specific information which is needed from the Grantee before commencing contract negotiations.

### **3.3 SECTION 3: ORGANIZATIONAL STRUCTURE, MANAGEMENT, AND KEY PERSONNEL**

Describe the Offeror's proposed project organizational structure. Discuss how the project will be managed including the principal and key staff assignments for this Feasibility Study. Identify the Project Manager who will be the individual responsible for this project. The Project Manager must have the responsibility and authority to act on behalf of the Offeror in matters related to the proposed Feasibility Study.

Provide a listing of personnel (including subcontractors and consultants) to be engaged in the project, either U.S. or local with the following information for key staff: position in the project; pertinent experience, curriculum vitae; other relevant information. If subcontractors are to be used, the organizational relationship between the firms must be described.

A manpower schedule and the level of effort for the project period, by activities and tasks, as detailed under the Work Plan shall be submitted. A statement confirming the availability of the proposed project manager and key staff over the duration of the project must be included in the proposal.

### **3.4 SECTION 4: TECHNICAL APPROACH AND WORK PLAN**

Describe in detail the proposed technical approach and work plan. Discuss the project requirements as perceived by the Offeror. Include a brief narrative of tasks within each activity series. Begin with the information gathering phase and continue through delivery and approval of all required reports.

Prepare a detailed schedule of performance that describes all activities and tasks within the Technical Work Plan, including periodic reporting or review points, incremental delivery dates, and other project milestones.

Based on the Technical Work Plan, and previous project experience, explain when and where Offeror will require support from the Grantee. Detail the amount of staff time required by the Grantee or participating agencies and any work space or facilities needed to complete the Feasibility Study.

### **3.5 SECTION 5: EXPERIENCE AND QUALIFICATIONS**

Provide a discussion of the Offeror's experience and qualifications which are relevant to the objectives and TOR for the Feasibility Study. If a subcontractor(s) is being used, similar information must be provided for the prime and each subcontractor firm proposed for the project. Relevant experience and qualifications of key staff proposed shall be provided including letters of commitment from the individuals proposed concerning their availability for contract performance.

As many as possible but not more than six (6) relevant and verifiable project references must be provided, including the following information:

Project name,  
Name and address of client (indicate if joint venture),  
Client contact person (name/ position/ current phone and fax numbers),  
Period of Contract,  
Description of services provided,  
Dollar amount of Contract, and  
Status and comments.

Offerors are strongly encouraged to include in their experience summary primarily those projects that are similar to or larger in scope than the Feasibility Study as described in this RFP.

#### **Section 4: AWARD CRITERIA**

Individual proposals will be initially evaluated by a Procurement Selection Committee of representatives from the Grantee. The Committee will then conduct a final evaluation and completion of ranking of qualified Offerors, and the Grantee shall promptly negotiate a contract with the best qualified Offeror. If a satisfactory contract cannot be negotiated with the best qualified Offeror, negotiations will be formally terminated. Negotiations shall then be undertaken with the second most qualified Offeror and so forth.

The selection of the Contractor will be based on the following criteria:

*Technical Experience (40 points):* Firm and team experience in preparing feasibility studies for national/regional meteorological services, including design, equipment, operation, workload demand estimation, distribution/dissemination procedures, environmental impact, and procurement procedures. This should include a demonstrated understanding of international meteorological standards and practices as well as ICAO and FAA requirements.

*Financial Expertise (10 points):* Firm and team experience in cost analysis, cost estimating, and development of a capital investment program for similar projects. Experience with, and understanding of, the requirements of the international development banks, such as the African Development Bank, that are likely to support the MSD Project.

*Regional Experience (25 points):* Firm and team's familiarity with meteorological situation in West Africa, including local and international regulations and requirements.

*Work Plan and Methodology (25 points):* Adequacy of the proposed work plan and suggested overall approach in responding to the Terms of Reference. The soundness and thoroughness of the technical approach and work plan detailed in the proposal and the overall quality of the

presentation should be evaluated. The proposal should provide an organization chart of key personnel with their qualifications and a staffing schedule for each key activity.

Proposals which do not include all requested information may be considered non-responsive.

Price will not be a factor in contractor selection.

## ANNEX 1

Director General; Ghana Meteorological Agency; P.O. Box L87; Legon, Accra; Ghana;  
Phone +233 243 658 291; Fax +233 217 012 519

Ghana: Feasibility Study on the Expansion of Meteorological Services

POC John Kusnierek, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009. The Grantee, the Ghana Meteorological Agency (GMet), invites submission of qualifications and proposal data (collectively referred to as the "Proposal") from interested U.S. firms which are qualified on the basis of experience and capability to develop a feasibility study for the Expansion of Meteorological Services in Ghana.

Forecasting services in Ghana are provided by GMet in conjunction with the Ghana Civil Aviation Authority (GCAA). The weather radar located at Kotoka International Airport is operated by GCAA and is functioning, but the ground stations reporting from outside the airport are limited in number, and their reports are prepared and disseminated manually. This creates a safety issue for aviation users that do not have access to state of the art meteorological services to warn of approaching storms, which can be severe, or to detect the wind shear conditions at the airports that are common during severe storms.

The Grantee seeks to enhance its ability to produce timely forecasts and to disseminate either short or long term weather forecasts in an efficient manner. The expansion of the Grantee's meteorological services will: (a) equip all airports with automated weather observation stations (AWOS) or radar surveillance; (b) input data collected into an automated meteorology database based on Geographic Information Systems (GIS) technology; and (c) communicate meteorological information and weather forecasts efficiently to aviation, agricultural, energy producing, water resource and industrial users. The Project will also establish a central Weather Forecast Office and enhance forecasting by the use of satellite and ground receiving and imaging systems.

This Feasibility Study is intended to (a) assess the hardware, software, and facilities requirements needed by the Grantee over the next 15 years to enable it to provide state-of-the-art weather forecasts and other meteorological services and (b) recommend changes to its organizational structure to optimize the analysis and dissemination of meteorological information.

The U.S. firm selected will be paid in U.S. dollars from a \$235,000 grant to the Grantee from the U.S. Trade and Development Agency (USTDA).

A detailed Request for Proposals (RFP), which includes requirements for the Proposal, the Terms of Reference, and a background definitional mission/desk study report are available from USTDA, at 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901. To request the RFP in PDF format, please go to: <https://www.ustda.gov/USTDA/FedBizOpps/RFP/rfpform.asp>. Requests for a mailed hardcopy version of the RFP may also be faxed to the IRC, USTDA at 703-875-4009. In the fax, please include your firm's name, contact person, address, and telephone number. Some firms have found that RFP materials sent by U.S. mail do not reach them in time

for preparation of an adequate response. Firms that want USTDA to use an overnight delivery service should include the name of the delivery service and your firm's account number in the request for the RFP. Firms that want to send a courier to USTDA to retrieve the RFP should allow one hour after faxing the request to USTDA before scheduling a pick-up. Please note that no telephone requests for the RFP will be honored. Please check your internal fax verification receipt. Because of the large number of RFP requests, USTDA cannot respond to requests for fax verification. Requests for RFPs received before 4:00 PM will be mailed the same day. Requests received after 4:00 PM will be mailed the following day. Please check with your courier and/or mail room before calling USTDA.

Only U.S. firms and individuals may bid on this USTDA financed activity. Interested firms, their subcontractors and employees of all participants must qualify under USTDA's nationality requirements as of the due date for submission of qualifications and proposals and, if selected to carry out the USTDA-financed activity, must continue to meet such requirements throughout the duration of the USTDA-financed activity. All goods and services to be provided by the selected firm shall have their nationality, source and origin in the U.S. or host country. The U.S. firm may use subcontractors from the host country for up to 20 percent of the USTDA grant amount. Details of USTDA's nationality requirements and mandatory contract clauses are also included in the RFP.

Interested U.S. firms should submit their Proposal in English directly to the Grantee by 4:00 p.m. local time, July 17, 2009 at the above address. Evaluation criteria for the Proposal are included in the RFP. Price will not be a factor in contractor selection, and therefore, cost proposals should NOT be submitted. The Grantee reserves the right to reject any and/or all Proposals. The Grantee also reserves the right to contract with the selected firm for subsequent work related to the project. The Grantee is not bound to pay for any costs associated with the preparation and submission of Proposals.

**ANNEX 2**

# **Modernization of the Ghanaian Meteorological Services Agency**

## **Project Description**

Ghana's meteorological forecasting is limited and was developed to provide the minimum required information to operating airlines. Forecasting services are provided by Ghanaian Meteorological Services Agency ("GMet") in conjunction with GCAA. The forecasts generally look no more than 5 days forward. The weather radar located at KIA is operated by GCAA and is functioning, but the ground stations reporting from outside the airport are limited and their reports are prepared and disseminated manually. This creates a safety issue for aviation users that do not have access to state of the art meteorological services to warn of approaching storms, which can be severe, or to detect the wind shear conditions at the airports that are common during severe storms.

GMet does not have the equipment or infrastructure to produce timely forecasts and to disseminate either short or long term weather forecasts in an efficient manner, one that would help to mitigate the effects of the often severe weather conditions that affect West Africa. The modernization of the GMet will: (a) equip all airports with automated weather observation stations ("AWOS") or radar surveillance; (b) input data collected into an automated meteorology database, a Geographic Information System ("GIS"); and (c) communicate meteorological information and weather forecasts efficiently to aviation, agricultural, energy producing, water resource and industrial users. It will also establish a central Weather Forecast Office and enhance forecasting by the use of satellite and ground receiving and imaging systems.

The proposed Study is intended (a) to assess the hardware, software, and facilities requirements needed by GMet over the next 15 years to enable it to provide state of the art weather forecasts and other meteorological services, and (b) to recommend changes to its organizational structure to optimize the analysis and dissemination of meteorological information.

## **Background**

Like much of Africa, Ghana's economy is heavily dependent on rainfall. Its weather system is dominated by the influence of the Atlantic Ocean/Gulf of Guinea, and Ghana's rainfall comes in drought/flood cycles. The weather cycles affect not just agriculture, where in times of severe drought farmers depend on irrigation for survival of their crops, but also electricity generation and industrial production. The southern two-thirds of Ghana has one of the largest manmade lakes in the world, Lake Volta, created by a dam

on the Volta River. Almost 80% of Ghana's electricity is generated by hydro power from Lake Volta, and lack of water to drive the turbines in drought conditions reduces the availability of electric power, which causes industrial disruptions. In addition, during droughts fire fighting is hampered. At present, while GMet produces weather forecasts, they are often underused because there is no adequate means of communicating the information, information that could be useful to farmers, for example, by helping them decide when to plant.

### **Sponsor Capabilities and Commitment**

The Director General of GMet is sponsoring this Study request, and the DM confirmed the government's support during discussions with the Minister of Aviation. In addition, the DM believes the Minister of Agriculture, the Minister of Water Resource Works and Housing, and the Minister of Energy have indicated their willingness to participate in the GMet Project.

### **Implementation Financing**

The importance of this project to the economy of Ghana seems evident. In our discussion, during the DM visit to the African Development Bank ("ADB") in Ghana, the ADB's Country Program Officer, Patrick Agboma, was encouraging and indicated that once technical and funding requirements are known, the ADB would support the transaction either directly or working with other international agencies to assist in funding the project. Any United States equipment which is exported as part of this project could be financed by Ex-Im Bank.

### **U.S. Export Potential**

ACA estimates that the GMet Project will have a total cost of some \$23 million, including equipment and services with a value of almost \$21 million that could be supplied by U.S. firms. These include design services, meteorological and communications equipment, and consulting and engineering services.

<b>Ghana Meteorological Services Modernization 15- year Cost Estimates - US \$</b>		
	<b>Total</b>	<b>U.S. Supplier Potential</b>
Automated Weather Observation	\$1,000,000	\$1,000,000
Doppler Weather Radar X band	\$1,600,000	\$1,600,000
Next Gen Radar	\$10,000,000	\$10,000,000
Satellite Phones/Hi Freq Radio	\$1,000,000	\$1,000,000
Misc Office Equipment	\$500,000	\$200,000
Satellite Communication base and line	\$4,000,000	\$4,000,000
Civil Costs	\$1,000,000	
Total	\$19,100,000	\$17,300,000
Contingency 20%	\$3,820,000	\$3,460,000
Total Project	\$22,920,000	\$20,760,000

## **U.S. Suppliers**

ACA contacted officials at 40 U.S. firms that it considers potential suppliers of goods or services to the GMet Project to determine each firm's interest, and 12 have asked to be kept informed. These firms are included in Appendix A with \*.

## **Foreign Competition and Market Entry Issues**

Ghana has very close historical and economic ties with European nations, in particular the UK. There is no impediment to U.S. exports to Ghana – in 1999, the countries entered into a US-Ghana Trade and Investment Framework Agreement to encourage bilateral trade. Indeed, Ghana imports most of its computing technology from the U.S., and U.S. exports to Ghana were valued at \$385 million in 2007, up 44 percent from the year earlier.

There are many companies based outside the U.S. selling meteorological equipment that will provide strong competition for U.S. companies; Eliasson of Sweden, and Vaisala of Finland are two of the largest.

## **Developmental Impact**

The GMet Project will allow Ghana to continue to develop its economy by ensuring safer skies and air travel to neighboring African countries and the rest of the world and by helping to improve agricultural and industrial output.

***Infrastructure:*** The primary benefit of the GMet Project is to provide Ghana with the ability to make more effective use of its air traffic infrastructure. In addition, by enhancing agricultural output, the project will benefit the Ghanaian economy overall and will lead to further infrastructure development and enhancement resulting from greater economic activity.

***Market Oriented Reforms:*** By stimulating the economy, through improvements in aviation capacity utilization and in agricultural production, the GMet Project will contribute to the market economy in Ghana. The Ghanaian government is committed to market oriented reforms to support its initiatives to reduce poverty, an example being the creation of the independent GACL with a mandate to operate on a commercial basis.

***Human Capacity Building:*** The GMet Project will provide about 20 new jobs in an expanded GMet, including highly-trained and qualified personnel, such as meteorologists and technicians, as well as support and clerical staff. The jobs require Ghanaian personnel to be trained to the highest global standards, adding to the technical skill base of the country's labor pool.

***Technology Transfer and Productivity Improvement:*** The GMet Project will incorporate the latest technology systems and equipment, thereby enhancing the capability to produce more effective forecasts more frequently while simultaneously increasing productivity by automating tasks that were performed manually previously.

## **Impact on Environment**

The DM expects that the GMet Project will have minimal environmental impact. It will incorporate the latest energy saving systems so will reduce pollution and greenhouse gas emissions, which should produce a positive impact on the environment.

## **Impact on U.S. Labor**

The GMet Project will not cause any dislocation of U.S. jobs. It is not expected to: (a) provide any incentive to induce a business enterprise currently located in the U.S. to relocate outside the U.S. or to reduce the number of employees in the U.S. by relocating production currently in the U.S. to overseas facilities; (b) contribute to the violation of

internationally recognized workers' rights; or (c) contribute to the production of any commodity that is in surplus in the global markets.

In fact the GMet Project should have a positive impact on the U.S. labor market because it will provide business opportunities for U.S. firms to supply meteorological-related goods and services in Ghana.

## **Study Team Qualifications**

ACA recommends that the selection of the study team for the GMet Project be carried out by the GMet through a USTDA-sponsored competitive RFP offering. The following are recommended qualification criteria for evaluating the proposals:

Technical Experience (40 points): Firm and team experience in preparing feasibility studies for national/regional meteorological services, including design, equipment, operation, workload demand estimation, distribution/dissemination procedures, environmental impact, and procurement procedures. This should include a demonstrated understanding of international meteorological standards and practices as well as ICAO and FAA requirements.

Finance (10 points): Firm and team experience in cost analysis, cost estimating, and development of a capital investment program for similar projects. Experience with, and understanding of, the requirements of the international development banks, such as the ADB, that are likely to support the GMet Project.

Regional Experience (25 points): Firm and team's familiarity with meteorological situation in West Africa, including local and international regulations and requirements.

Work Plan and Methodology (25 points): Adequacy of the proposed work plan and suggested overall approach in responding to the Terms of Reference. The soundness and thoroughness of the technical approach and work plan detailed in the proposal and the overall quality of the presentation should be evaluated. The proposal should provide an organization chart of key personnel with their qualifications and a staffing schedule for each key activity.

## **Justification**

The primary benefit from the GMet Project will be to provide timely meteorological information to diverse sectors of the economy to support Ghana's economic growth and

to provide the general public with better weather forecasts to the general benefit of society. With regard to aviation, more-timely forecasting and dissemination of weather information will help ensure safer operations, reduce delays and the costs associated with them, and enable more efficient aircraft routings that will reduce both fuel usage and lower other operating costs.

In addition to benefiting the aviation sector, the GMet Project will have social benefits relating to:

- Water management and allocation;
- Electricity production;
- Improved agricultural productivity and output; and
- Industrial production related to electrical generation

The government of Ghana recognizes the need to maintain and enhance its meteorological capabilities to support the long-term growth of the economy.

Significant potential exists for U.S. firms, engaged in a business sector where the U.S. has a true center of excellence, to export goods and services to an African nation with which the U.S. has good relations. USTDA support of the GMet Project will: (a) help ensure its “go ahead” by providing an independent confirmation of its feasibility that can be used with funding agencies; and (b) draw favorable attention to U.S. suppliers beyond those directly associated with the Project.

## **Recommendations**

Based on the findings of this DM, the modernization of GMet offers an excellent opportunity for the export of U.S. equipment and services having a potential value of some \$21 million and for the introduction of U.S. meteorological and communications equipment providers and service providers to Ghana. In addition, USTDA support could positively influence decisions to purchase U.S. goods and services. Doing business in Ghana is a good first step for U.S. companies who have been hesitant to do business in Africa, and, hence, this may represent a greater opportunity than the GMet Project itself.

The GMet Project meets USTDA criteria in the areas of developmental impact, environmental impact, and its effect on the U.S. job market.

The DM recommends that USTDA provide a grant in the amount of \$234,220 for the preparation of a feasibility study to evaluate the GMet proposal for modernization of meteorological services in Ghana. This will provide needed capabilities that will enhance



## ANNEX 3



**U.S. TRADE AND DEVELOPMENT AGENCY  
Arlington, VA 22209-2131**

**NATIONALITY, SOURCE, AND ORIGIN REQUIREMENTS**

The purpose of USTDA's nationality, source, and origin requirements is to assure the maximum practicable participation of American contractors, technology, equipment and materials in the prefeasibility, feasibility, and implementation stages of a project.

**USTDA STANDARD RULE (GRANT AGREEMENT STANDARD LANGUAGE):**

Except as USTDA may otherwise agree, each of the following provisions shall apply to the delivery of goods and services funded by USTDA under this Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from host country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for implementation of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in host country are not subject to the above restrictions. USTDA will make available further details concerning these standards of eligibility upon request.

**NATIONALITY:**

1) Rule

Except as USTDA may otherwise agree, the Contractor for USTDA funded activities must be either a U.S. firm or a U.S. individual. Prime contractors may utilize U.S.

subcontractors without limitation, but the use of host country subcontractors is limited to 20% of the USTDA grant amount.

## 2) Application

Accordingly, only a U.S. firm or U.S. individual may submit proposals on USTDA funded activities. Although those proposals may include subcontracting arrangements with host country firms or individuals for up to 20% of the USTDA grant amount, they may not include subcontracts with third country entities. U.S. firms submitting proposals must ensure that the professional services funded by the USTDA grant, to the extent not subcontracted to host country entities, are supplied by employees of the firm or employees of U.S. subcontractor firms who are U.S. individuals.

Interested U.S. firms and consultants who submit proposals must meet USTDA nationality requirements as of the due date for the submission of proposals and, if selected, must continue to meet such requirements throughout the duration of the USTDA-financed activity. These nationality provisions apply to whatever portion of the Terms of Reference is funded with the USTDA grant.

## 3) Definitions

A "U.S. individual" is (a) a U.S. citizen, or (b) a non-U.S. citizen lawfully admitted for permanent residence in the U.S. (a green card holder).

A "U.S. firm" is a privately owned firm which is incorporated in the U.S., with its principal place of business in the U.S., and which is either (a) more than 50% owned by U.S. individuals, or (b) has been incorporated in the U.S. for more than three (3) years prior to the issuance date of the request for proposals; has performed similar services in the U.S. for that three (3) year period; employs U.S. citizens in more than half of its permanent full-time positions in the U.S.; and has the existing capability in the U.S. to perform the work in question.

A partnership, organized in the U.S. with its principal place of business in the U.S., may also qualify as a "U.S. firm" as would a joint venture organized or incorporated in the United States consisting entirely of U.S. firms and/or U.S. individuals.

A nonprofit organization, such as an educational institution, foundation, or association may also qualify as a "U.S. firm" if it is incorporated in the United States and managed by a governing body, a majority of whose members are U.S. individuals.

## **SOURCE AND ORIGIN:**

### 1) Rule

In addition to the nationality requirement stated above, any goods (e.g., equipment and materials) and services related to their shipment (e.g., international transportation and insurance) funded under the USTDA Grant Agreement must have their source and origin in the United States, unless USTDA otherwise agrees. However, necessary purchases of goods and project support services which are unavailable from a U.S. source (e.g., local food, housing and transportation) are eligible without specific USTDA approval.

### 2) Application

Accordingly, the prime contractor must be able to demonstrate that all goods and services purchased in the host country to carry out the Terms of Reference for a USTDA Grant Agreement that were not of U.S. source and origin were unavailable in the United States.

### 3) Definitions

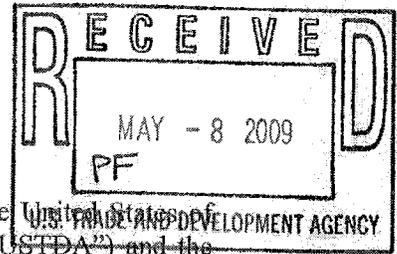
“Source” means the country from which shipment is made.

“Origin” means the place of production, through manufacturing, assembly or otherwise.

*Questions regarding these nationality, source and origin requirements may be addressed to the USTDA Office of General Counsel.*

## ANNEX 4

## GRANT AGREEMENT



The Grant Agreement is entered into between the Government of the United States of America acting through the U.S. Trade and Development Agency ("USTDA") and the Government of the Republic of Ghana acting through the Ministry of Communications acting through the Ghana Meteorological Agency (GMet) ("Grantee"). USTDA agrees to provide the Grantee under the terms of this Agreement US \$235,000 ("USTDA Grant") to fund the cost of goods and services required for a feasibility study ("Study") on the proposed Expansion of Meteorological Services project ("Project") in Ghana ("Host Country")

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### 1. USTDA Funding

The funding to be provided under this Grant Agreement shall be used to fund the costs of a contract between the Grantee and the U.S. firm selected by the Grantee ("Contractor") under which the Contractor will perform the Study ("Contract"). Payment to the Contractor will be made directly by USTDA on behalf of the Grantee with the USTDA Grant funds provided under this Grant Agreement.

### 2. Terms of Reference

The Terms of Reference for the Study ("Terms of Reference") are attached as Annex I and are hereby made a part of this Grant Agreement. The Study will examine the technical, financial, environmental, and other critical aspects of the proposed Project. The Terms of Reference for the Study shall also be included in the Contract.

### 3. Standards of Conduct

USTDA and the Grantee recognize the existence of standards of conduct for public officials, and commercial entities, in their respective countries. The parties to this Grant Agreement and the Contractor shall observe these standards, which include not accepting payment of money or anything of value, directly or indirectly, from any person for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the Study.

### 4. Grantee Responsibilities

The Grantee shall undertake its best efforts to provide reasonable support for the Contractor, such as local transportation, office space, and secretarial support.

## **5. USTDA as Financier**

### **(A) USTDA Approval of Competitive Selection Procedures**

Selection of the U.S. Contractor shall be carried out by the Grantee according to its established procedures for the competitive selection of contractors with advance notice of the procurement published online through *Federal Business Opportunities* ([www.fedbizopps.gov](http://www.fedbizopps.gov)). Upon request, the Grantee will submit these contracting procedures and related documents to USTDA for information and/or approval.

### **(B) USTDA Approval of Contractor Selection**

The Grantee shall notify USTDA at the address of record set forth in Article 17 below upon selection of the Contractor to perform the Study. Upon approval of this selection by USTDA, the Grantee and the Contractor shall then enter into a contract for performance of the Study. The Grantee shall notify in writing the U.S. firms that submitted unsuccessful proposals to perform the Study that they were not selected.

### **(C) USTDA Approval of Contract Between Grantee and Contractor**

The Grantee and the Contractor shall enter into a contract for performance of the Study. This contract, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing. To expedite this approval, the Grantee (or the Contractor on the Grantee's behalf) shall transmit to USTDA, at the address set forth in Article 17 below, a photocopy of an English language version of the signed contract or a final negotiated draft version of the contract.

### **(D) USTDA Not a Party to the Contract**

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of the contract and any amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of funding the Study and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract or any subcontract, jointly or separately, without thereby incurring any responsibility or liability to such parties. Any approval or failure to approve by USTDA shall not bar the Grantee or USTDA from asserting any right they might have against the

Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Grantee or USTDA.

**(E) Grant Agreement Controlling**

Regardless of USTDA approval, the rights and obligations of any party to the contract or subcontract thereunder must be consistent with this Grant Agreement. In the event of any inconsistency between the Grant Agreement and any contract or subcontract funded by the Grant Agreement, the Grant Agreement shall be controlling.

**6. Disbursement Procedures**

**(A) USTDA Approval of Contract Required**

USTDA will make disbursements of Grant funds directly to the Contractor only after USTDA approves the Grantee's contract with the Contractor.

**(B) Contractor Invoice Requirements**

The Grantee should request disbursement of funds by USTDA to the Contractor for performance of the Study by submitting invoices in accordance with the procedures set forth in the USTDA Mandatory Clauses in Annex II.

**7. Effective Date**

The effective date of this Grant Agreement ("Effective Date") shall be the date of signature by both parties or, if the parties sign on different dates, the date of the last signature.

**8. Study Schedule**

**(A) Study Completion Date**

The completion date for the Study, which is February 1, 2011, is the date by which the parties estimate that the Study will have been completed.

**(B) Time Limitation on Disbursement of USTDA Grant Funds**

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this Grant Agreement for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.

## **9. USTDA Mandatory Clauses**

All contracts funded under this Grant Agreement shall include the USTDA mandatory clauses set forth in Annex II to this Grant Agreement. All subcontracts funded or partially funded with USTDA Grant funds shall include the USTDA mandatory clauses, except for clauses B(1), G, H, I, and J.

## **10. Use of U.S. Carriers**

### **(A) Air**

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

### **(B) Marine**

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

## **11. Nationality, Source and Origin**

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in Host Country are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

## **12. Taxes**

USTDA funds provided under the Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country. Neither the Grantee nor the Contractor will seek reimbursement from USTDA for such taxes, tariffs, duties, fees or other levies.

### **13. Cooperation Between Parties and Follow-Up**

The parties will cooperate to assure that the purposes of the Grant Agreement are accomplished. For five (5) years following receipt by USTDA of the Final Report (as defined in Clause I of Annex II), the Grantee agrees to respond to any reasonable inquiries from USTDA about the status of the Project.

### **14. Implementation Letters**

To assist the Grantee in the implementation of the Study, USTDA may, from time to time, issue implementation letters that will provide additional information about matters covered by the Grant Agreement. The parties may also use jointly agreed upon implementation letters to confirm and record their mutual understanding of matters covered by the Grant Agreement.

### **15. Recordkeeping and Audit**

The Grantee agrees to maintain books, records, and other documents relating to the Study and the Grant Agreement adequate to demonstrate implementation of its responsibilities under the Grant Agreement, including the selection of contractors, receipt and approval of contract deliverables, and approval or disapproval of contractor invoices for payment by USTDA. Such books, records, and other documents shall be separately maintained for three (3) years after the date of the final disbursement by USTDA. The Grantee shall afford USTDA or its authorized representatives the opportunity at reasonable times to review books, records, and other documents relating to the Study and the Grant Agreement.

### **16. Representation of Parties**

For all purposes relevant to the Grant Agreement, the Government of the United States of America will be represented by the U. S. Ambassador to Host Country or USTDA and Grantee will be represented by the Director General of the Ghana Meteorological Agency. The parties hereto may, by written notice, designate additional representatives for all purposes under the Grant Agreement.

### **17. Addresses of Record for Parties**

Any notice, request, document, or other communication submitted by either party to the other under the Grant Agreement shall be in writing or through a wire or electronic medium which produces a tangible record of the transmission, such as a telegram, cable or facsimile, and will be deemed duly given or sent when delivered to such party at the following:

To: Michael Tanu  
Director General  
Ghana Meteorological Agency  
P.O. Box LG87  
Legon, Accra  
Ghana

Phone: (Office) +233 21 7012518  
(Mobile) +233 24 6588247  
Fax: +233 21 511981  
E-mail: meteo@africaonline.com.gh

To: U.S. Trade and Development Agency  
1000 Wilson Boulevard, Suite 1600  
Arlington, Virginia 22209-3901  
USA

Phone: (703) 875-4357  
Fax: (703) 875-4009

All such communications shall be in English, unless the parties otherwise agree in writing. In addition, the Grantee shall provide the Commercial Section of the U.S. Embassy in Host Country with a copy of each communication sent to USTDA.

Any communication relating to this Grant Agreement shall include the following fiscal data:

Appropriation No.: 119/101001  
Activity No.: 2009-11014A  
Reservation No.: 2009110018  
Grant No.: GH2009110005

#### **18. Termination Clause**

Either party may terminate the Grant Agreement by giving the other party thirty (30) days advance written notice. The termination of the Grant Agreement will end any obligations of the parties to provide financial or other resources for the Study, except for payments which they are committed to make pursuant to noncancellable commitments entered into with third parties prior to the written notice of termination.

**19. Non-waiver of Rights and Remedies**

No delay in exercising any right or remedy accruing to either party in connection with the Grant Agreement shall be construed as a waiver of such right or remedy.

**20. U.S. Technology and Equipment**

By funding this Study, USTDA seeks to promote the project objectives of the Host Country through the use of U.S. technology, goods, and services. In recognition of this purpose, the Grantee agrees that it will allow U.S. suppliers to compete in the procurement of technology, goods and services needed for Project implementation.

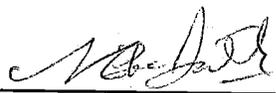
**[THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK]**

**IN WITNESS WHEREOF, the Government of the United States of America and the Government of the Republic of Ghana, each acting through its duly authorized representative, have caused this Agreement to be signed in the English language in their names and delivered as of the day and year written below. In the event that this Grant Agreement is signed in more than one language, the English language version shall govern.**

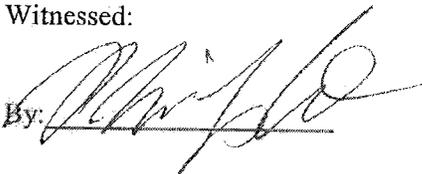
**For the Government of the  
United States of America**

By:   
Donald Teitelbaum  
Ambassador  
Date: 28 April 2009

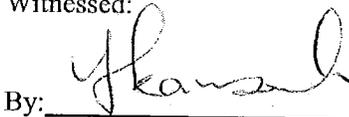
**For the Government of the  
Republic of Ghana**

By:   
Michael Tanu  
Director General  
Date: 28 April 2009

Witnessed:

By: 

Witnessed:

By: 

**Annex I -- Terms of Reference**

**Annex II -- USTDA Mandatory Clauses**

## Annex I

### **Terms of Reference**

#### **Background:**

Forecasting services in Ghana are provided by the Ghana Meteorological Agency. The multipurpose radar with weather observation capabilities located at Kotoka International Airport is operated by Ghana Civil Aviation Authority (GCAA) and is functioning but not accessible to Ghana Meteorological Agency. Also the ground stations reporting from outside the airport are limited in number, and their reports are prepared and disseminated manually. This creates a safety issue for aviation users that do not have access to state of the art meteorological services to warn of approaching storms, which can be severe, or to detect the wind shear conditions at the airports that are common during severe storms.

The Grantee seeks to enhance its ability to produce timely forecasts and to disseminate either short, medium or long range weather forecasts in an efficient manner. The expansion of the Grantee's meteorological services will: (a) equip all airports with automated weather observation stations ("AWOS") or radar surveillance; (b) input data collected into an automated meteorology database based on Geographic Information Systems (GIS) technology; and (c) communicate meteorological information and weather forecasts efficiently to aviation, agricultural, energy producing, water resource and industrial users. The Project will also establish a central Weather Forecast Office and enhance forecasting by the use of satellite and ground receiving and imaging systems.

This Study is intended to (a) assess the hardware, software, and facilities requirements needed by the Grantee over the next 15 years to enable it to provide state-of-the-art weather forecasts and other meteorological services and (b) recommend changes to its organizational structure to optimize the analysis and dissemination of meteorological information.

#### **Task 1: Kick Off Meeting and Review Reports and Data**

1.1: The Contractor shall obtain and review information concerning Ghana's existing meteorological services. The Contractor shall obtain information from the Grantee, the GCAA, Ghanaian Ministry of Agriculture, U.S. Federal Aviation Administration (FAA), International Civil Aviation Organization (ICAO), and other organizations as appropriate.

1.2: The Contractor shall travel to Ghana to meet with the Grantee in Accra to discuss the basis of the Grantee's Project and the Study's objectives. In addition, the Contractor shall meet with the GCAA, the Ministry of Agriculture, the Ministry of Water Resource Works and Housing, and the Ministry of Energy to discuss each stakeholder's meteorological information and weather forecasting needs and requirements.

1.3: The Contractor shall develop a Work Plan and Timetable for carrying out the Study, and obtain the Grantee's agreement.

Task 1 Deliverable: The Contractor shall provide a written report describing any initial observations, findings and recommendations based on the materials reviewed in Task 1, as well as the Work Plan and Timetable for carrying out the Study. The Task 1 deliverable shall be included in the Final Report.

## **Task 2: Inventory Current Meteorological Systems and Facilities**

The purpose of this Inventory is to gain a full understanding of on-site conditions and of issues related to current equipment and facilities pertaining to meteorological services; airports; and other sites that need to be considered. The Contractor shall identify the adequacies and shortcomings of the existing systems.

2.1: The Contractor shall conduct a detailed field assessment at the airports that have, or are projected to have, significant commercial air traffic in the future. This assessment should include Kotoka International, Kumasi, Sunyani, and Tamale airports, as well as any other site similarly designated by the GCAA and Ghana Airports Company Limited (GACL). The field assessment shall assess each of the identified airport's current equipment, facilities, system configuration, system capabilities, operations, personnel, and training as they pertain to meteorological services.

2.2: The Contractor shall work with the Grantee to develop an inventory of the Grantee's existing equipment and facilities in addition to those identified in Task 2.1. The inventory shall include current equipment, facilities, system configuration, system capabilities, operations, personnel, and training as they pertain to meteorological services.

2.3: The Contractor shall determine the meteorological needs of the agriculture, water resources and energy sector users and shall visit key sites identified in discussions with the key stakeholders identified in Task 1.2 above.

Task 2 Deliverable: The Contractor shall conduct site visits to airports and other key sites to develop an inventory of the Grantee's current meteorological equipment, systems, facilities, and operations, including the shortcomings of existing systems in dealing with current weather forecasting needs. The Task 2 Deliverable shall be included in the Final Report.

### **Task 3: Economic and Socio-Economic Analysis**

3.1: The Contractor shall review information on the types, frequency, and severity of weather related phenomena affecting Ghana. The Contractor's review shall be focused on incorporating an understanding of local weather patterns into the equipment planning and financial analysis included in subsequent tasks of these Terms of Reference.

3.2: The Contractor shall review information on the extent and cost of the damage caused by weather phenomena in Ghana including property damage, injuries and deaths, environmental damage, and the socio-economic implications of such damage. The Contractor shall identify areas where current forecasting and information dissemination capabilities are inadequate to forecast and disseminate information about potentially dangerous or damaging weather phenomena.

Task 3 Deliverable: The Contractor shall report its findings for Task 3 and perform an analysis of the economic and socio-economic benefits associated with the expansion of meteorological services in Ghana. The Task 3 Deliverable shall be included in the Final Report.

### **Task 4: Equipment and Facility Requirements**

4.1: The Contractor shall review the Grantee's estimates of needed equipment and facilities and make recommendations for new equipment and facilities based on the findings of Tasks 1-3. The Contractor's recommendations shall consider the need to accommodate future growth and upgrades to newer technology.

4.2: The Contractor shall assess the adequacy of the Grantee's existing facilities to accommodate the new equipment recommended in Task 4.1 and make recommendations for the upgrade and acquisition of new facilities including land, storage and office space as appropriate.

4.3: The Contractor shall detail the technical specifications, quantities, and requirements for all of the equipment recommended to expand the Grantee's capabilities and to upgrade the Grantee's existing system. The Contractor shall analyze the recommended

equipment, locations and facilities in order to determine the most cost effective solutions considering the Grantee's needs over the next 15 years.

**Task 4 Deliverable:** The Contractor shall provide a written report which details equipment requirements and specifications, facility locations, and building configurations to accommodate the Grantee's meteorological service needs over the next 15 years. The Task 4 Deliverable shall be included in the Final Report.

#### **Task 5: Capital Investment Plan**

The Contractor shall prepare a Capital Investment Plan for the Project that shall include investments required to implement the recommendations of Task 4 including all equipment and civil works related to the Project, as well as the acquisition of radar and monitoring equipment needed by the Grantee's systems to maintain and enhance its capabilities in the future. The Capital Investment Plan shall include estimates for meteorological equipment, communications equipment, civil engineering construction costs, land and building acquisition, fees and expenses, transition costs, and timing of procurements.

**Task 5 Deliverable:** The Contractor shall provide a detailed Capital Investment Plan for the expansion of meteorological services in Ghana. The Task 5 Deliverable shall be included in the Final Report.

#### **Task 6: Preliminary Environmental Impact Assessment**

6.1: The Contractor shall prepare a Preliminary Environmental Impact Assessment that identifies any potential negative and positive impacts resulting from the Project. This Assessment shall include reference to local requirements and requirements of multi-lateral lending agencies, such as the World Bank, and African Development Bank. The Contractor shall make recommendations to mitigate any potentially negative environmental impacts.

**Task 6 Deliverable:** The Contractor shall prepare a Preliminary Environmental Impact Assessment for Project. The Task 6 Deliverable shall be included in the Final Report.

#### **Task 7: Organizational Issues**

7.1: The Contractor shall conduct a review of the Grantee's organizational structure, and the Grantee's plan for the establishment of the central Weather Forecast Office.

7.2: The Contractor shall make recommendations on organizational changes that will be needed by the Grantee in order for it to most effectively provide weather forecasting services to all sectors, including aviation, agriculture, and industry. The Contractor shall identify the management, maintenance, and staff skills required to maintain the meteorological systems consistent with international best practices, and make recommendations on the needed staffing levels over the next five years.

Task 7 Deliverable: The Contractor shall develop recommendations on the optimal organizational structure and staffing of the Grantee's organization and its Weather Forecast Office. The Task 7 Deliverable shall be included in the Final Report.

### **Task 8: Financial Analysis**

8.1: The Contractor shall prepare a Financial Analysis of the Project based on information gathered in previous Tasks. In addition to the Capital Investment Plan prepared in Task 5, the Financial Analysis shall include the costs of capital, and the ongoing costs of operations, including maintenance, staff, training, and other human resource requirements. The Financial Analysis shall address revenues that will be available to fund the Project such as aviation user fees based on the ICAO Manual on Air Navigation Services Economics, and the World Meteorological Organization ("WMO") Guide on Aeronautical Meteorological Services Cost Recovery, among others.

8.2: The Contractor shall prepare a 15-year financial forecast model showing all cash flows and the projected subsidy that may be needed to fully fund the Grantee's operations. The analysis shall be in constant U.S. dollars, and assumptions made by the Contractor in the forecast shall be explained in detail. The Contractor shall test the sensitivity of the projection to factors such as varying costs, inflation, currency prices, financing options, and implementation delays.

Task 8 Deliverable: The Contractor shall prepare a Financial Analysis of the Project. The Task 8 Deliverable shall be included in the Final Report.

### **Task 9: Potential U.S. Sources of Supply**

9.1: The Contractor shall develop an estimate of the potential for procurement of U.S. goods and services for implementation of the Project. The Contractor shall include a list of potential U.S. suppliers and assess their level of interest in the Project. The list shall include U.S. company name, address, personnel contact names with phone and email

addresses, and the goods or services that could be exported in connection with the Project.

**Task 9 Deliverable:** The Contractor shall develop a list of potential U.S. suppliers of goods and services interested in the Project. The Task 9 Deliverable shall be included in the Final Report.

#### **Task 10: Financing Options**

10.1: Based on the findings of Task 8, the Contractor shall determine the amount of capital required from outside sources to implement the Project.

10.2: The Contractor shall identify several potential outside funding sources including the World Bank, African Development Bank, Ex-Im Bank, and other financial institutions with an interest in the Project. The Contractor shall contact each of the identified sources, engage in substantive discussions related to the Project, and determine their interest in financing the Project.

**Task 10 Deliverable:** The Contractor shall provide a written report which identifies potential sources of financing for the Project. The Task 10 Deliverable shall be included in the Final Report.

#### **Task 11: Implementation Plan**

The Contractor shall prepare an Implementation Plan showing the steps necessary to implement the Project and an accompanying timetable. The Implementation Plan and the timetable shall both be developed in a manner consistent with the findings of the Capital Investment Plan developed in Task 5 above.

**Task 11 Deliverable:** The Contractor shall develop an Implementation Plan and timetable for the Project. The Task 11 Deliverable shall be included in the Final Report.

#### **Task 12: Developmental Impact Assessment**

The Contractor shall assess the development benefits associated with the Project. The assessment shall include examples of the development benefits that would be expected in Ghana if the Project is implemented as outlined in the Final Report. The Assessment shall give emphasis to:

*Infrastructure:* improvements in the physical, financial, and social infrastructure of Ghana.

*Technology Transfer and Productivity Improvements:* introduction of advanced technologies and improvement of processes that stimulate greater economic productivity.

*Human Capacity Building:* new job opportunities, sustained employment, or advanced training to upgrade the capability of the workforce.

*Market-Oriented Reforms:* transparency and private sector participation.

*Other/Spin-Off Effects:* any other developmental benefits derived from the Project including, for example, decreased use of aviation fuel because of more-optimized flight routings and increased agricultural production due to better weather forecasting.

Task 12 Deliverable: The Contractor shall provide a detailed assessment of the developmental impact of the Project. The Task 12 Deliverable shall be included in the Final Report.

### **Task 13: Final Report**

13.1: The Contractor shall prepare and deliver to the Grantee a full and complete draft Final Report on all the work performed under these Terms of Reference. The Grantee shall be given the opportunity to make comments and suggestions before the submission of the Final Report.

13.2: The Contractor shall prepare and deliver to the Grantee and USTDA a substantive and comprehensive Final Report of all work performed under these Terms of Reference. The Final Report shall be organized according to the above tasks, and shall include all deliverables and documents that have been provided to the Grantee. The Final Report shall be prepared in accordance with Clause I of Annex II of the Grant Agreement.

#### Notes:

- (1) The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.
- (2) The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.
- (3) The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.

## Annex II

### USTDA Mandatory Contract Clauses

#### A. USTDA Mandatory Clauses Controlling

The parties to this contract acknowledge that this contract is funded in whole or in part by the U.S. Trade and Development Agency ("USTDA") under the Grant Agreement between the Government of the United States of America, acting through USTDA, and the Government of the Republic of Ghana acting through the Ministry of Communications acting through the Ghana Meteorological Agency ("Client"), dated \_\_\_\_\_ ("Grant Agreement"). The Client has selected \_\_\_\_\_ ("Contractor") to perform the feasibility study ("Study") for the Expansion of Meteorological Services project ("Project") in Ghana ("Host Country"). Notwithstanding any other provisions of this contract, the following USTDA mandatory contract clauses shall govern. All subcontracts entered into by Contractor funded or partially funded with USTDA Grant funds shall include these USTDA mandatory contract clauses, except for clauses B(1), G, H, I, and J. In addition, in the event of any inconsistency between the Grant Agreement and any contract or subcontract thereunder, the Grant Agreement shall be controlling.

#### B. USTDA as Financier

##### (1) USTDA Approval of Contract

All contracts funded under the Grant Agreement, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing in order to be effective with respect to the expenditure of USTDA Grant funds. USTDA will not authorize the disbursement of USTDA Grant funds until the contract has been formally approved by USTDA or until the contract conforms to modifications required by USTDA during the contract review process.

##### (2) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of this contract and amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of financing the Study and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract

or any subcontract, jointly or separately, without thereby incurring any responsibility or liability to such parties. Any approval or failure to approve by USTDA shall not bar the Client or USTDA from asserting any right they might have against the Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Client or USTDA.

### **C. Nationality, Source and Origin**

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in Host Country are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

### **D. Recordkeeping and Audit**

The Contractor and subcontractors funded under the Grant Agreement shall maintain, in accordance with generally accepted accounting procedures, books, records, and other documents, sufficient to reflect properly all transactions under or in connection with the contract. These books, records, and other documents shall clearly identify and track the use and expenditure of USTDA funds, separately from other funding sources. Such books, records, and documents shall be maintained during the contract term and for a period of three (3) years after final disbursement by USTDA. The Contractor and subcontractors shall afford USTDA, or its authorized representatives, the opportunity at reasonable times for inspection and audit of such books, records, and other documentation.

### **E. U.S. Carriers**

#### **(1) Air**

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

**(2) Marine**

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

**F. Workman's Compensation Insurance**

The Contractor shall provide adequate Workman's Compensation Insurance coverage for work performed under this Contract.

**G. Reporting Requirements**

The Contractor shall advise USTDA by letter as to the status of the Project on March 1st annually for a period of two (2) years after completion of the Study. In addition, if at any time the Contractor receives follow-on work from the Client, the Contractor shall so notify USTDA and designate the Contractor's contact point including name, telephone, and fax number. Since this information may be made publicly available by USTDA, any information which is confidential shall be designated as such by the Contractor and provided separately to USTDA. USTDA will maintain the confidentiality of such information in accordance with applicable law.

**H. Disbursement Procedures**

**(1) USTDA Approval of Contract**

Disbursement of Grant funds will be made only after USTDA approval of this contract. To make this review in a timely fashion, USTDA must receive from either the Client or the Contractor a photocopy of an English language version of a signed contract or a final negotiated draft version to the attention of the General Counsel's office at USTDA's address listed in Clause M below.

**(2) Payment Schedule Requirements**

A payment schedule for disbursement of Grant funds to the Contractor shall be included in this Contract. Such payment schedule must conform to the following USTDA requirements: (1) up to twenty percent (20%) of the total USTDA Grant amount may be used as a mobilization payment; (2) all other payments, with the exception of the final payment, shall be based upon contract performance milestones; and (3) the final payment may be no less than fifteen percent (15%) of the total USTDA Grant amount, payable upon receipt by USTDA of an approved Final Report in accordance with the specifications and quantities set forth in Clause I below. Invoicing procedures for all payments are described below.

### **(3) Contractor Invoice Requirements**

USTDA will make all disbursements of USTDA Grant funds directly to the Contractor. The Contractor must provide USTDA with an ACH Vendor Enrollment Form (available from USTDA) with the first invoice. The Client shall request disbursement of funds by USTDA to the Contractor for performance of the contract by submitting the following to USTDA:

#### **(a) Contractor's Invoice**

The Contractor's invoice shall include reference to an item listed in the Contract payment schedule, the requested payment amount, and an appropriate certification by the Contractor, as follows:

##### **(i) For a mobilization payment (if any):**

"As a condition for this mobilization payment, the Contractor certifies that it will perform all work in accordance with the terms of its Contract with the Client. To the extent that the Contractor does not comply with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

##### **(ii) For contract performance milestone payments:**

"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

##### **(iii) For final payment:**

"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. Specifically, the Contractor has submitted the Final Report to the Client, as required by the Contract, and received the Client's approval of the Final Report. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

#### **(b) Client's Approval of the Contractor's Invoice**

**(i)** The invoice for a mobilization payment must be approved in writing by the Client.

(ii) For contract performance milestone payments, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and the terms and conditions of the USTDA Grant Agreement."

(iii) For final payment, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and terms and conditions of the USTDA Grant Agreement. The Final Report submitted by the Contractor has been reviewed and approved by the Client. "

**(c) USTDA Address for Disbursement Requests**

Requests for disbursement shall be submitted by courier or mail to the attention of the Finance Department at USTDA's address listed in Clause M below.

**(4) Termination**

In the event that the Contract is terminated prior to completion, the Contractor will be eligible, subject to USTDA approval, for reasonable and documented costs which have been incurred in performing the Terms of Reference prior to termination, as well as reasonable wind down expenses. Reimbursement for such costs shall not exceed the total amount of undisbursed Grant funds. Likewise, in the event of such termination, USTDA is entitled to receive from the Contractor all USTDA Grant funds previously disbursed to the Contractor (including but not limited to mobilization payments) which exceed the reasonable and documented costs incurred in performing the Terms of Reference prior to termination.

**I. USTDA Final Report**

**(1) Definition**

"Final Report" shall mean the Final Report described in the attached Annex I Terms of Reference or, if no such "Final Report" is described therein, "Final Report" shall mean a substantive and comprehensive report of work performed in accordance with the attached Annex I Terms of Reference, including any documents delivered to the Client.

**(2) Final Report Submission Requirements**

The Contractor shall provide the following to USTDA:

(a) One (1) complete version of the Final Report for USTDA's records. This version shall have been approved by the Client in writing and must be in the English language. It is the responsibility of the Contractor to ensure that confidential information, if any, contained in this version be clearly marked. USTDA will maintain the confidentiality of such information in accordance with applicable law.

and

(b) One (1) copy of the Final Report suitable for public distribution ("Public Version"). The Public Version shall have been approved by the Client in writing and must be in the English language. As this version will be available for public distribution, it must not contain any confidential information. If the report in (a) above contains no confidential information, it may be used as the Public Version. In any event, the Public Version must be informative and contain sufficient Project detail to be useful to prospective equipment and service providers.

and

(c) Two (2) CD-ROMs, each containing a complete copy of the Public Version of the Final Report. The electronic files on the CD-ROMs shall be submitted in a commonly accessible read-only format. As these CD-ROMs will be available for public distribution, they must not contain any confidential information. It is the responsibility of the Contractor to ensure that no confidential information is contained on the CD-ROMs.

The Contractor shall also provide one (1) copy of the Public Version of the Final Report to the Foreign Commercial Service Officer or the Economic Section of the U.S. Embassy in Host Country for informational purposes.

### **(3) Final Report Presentation**

All Final Reports submitted to USTDA must be paginated and include the following:

(a) The front cover of every Final Report shall contain the name of the Client, the name of the Contractor who prepared the report, a report title, USTDA's logo, USTDA's mailing and delivery addresses. If the complete version of the Final Report contains confidential information, the Contractor shall be responsible for labeling the front cover of that version of the Final Report with the term "Confidential Version." The Contractor shall be responsible for labeling the front cover of the Public Version of the Final Report with the term "Public Version." The front cover of every Final Report shall also contain the following disclaimer:

"This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U. S. Government. The opinions, findings, conclusions or recommendations expressed in this document are those of the author(s) and do not necessarily represent the official position or policies of

USTDA. USTDA makes no representation about, nor does it accept responsibility for, the accuracy or completeness of the information contained in this report."

(b) The inside front cover of every Final Report shall contain USTDA's logo, USTDA's mailing and delivery addresses, and USTDA's mission statement. Camera-ready copy of USTDA Final Report specifications will be available from USTDA upon request.

(c) The Contractor shall affix to the front of the CD-ROM a label identifying the Host Country, USTDA Activity Number, the name of the Client, the name of the Contractor who prepared the report, a report title, and the following language:

"The Contractor certifies that this CD-ROM contains the Public Version of the Final Report and that all contents are suitable for public distribution."

(d) The Contractor and any subcontractors that perform work pursuant to the Grant Agreement must be clearly identified in the Final Report. Business name, point of contact, address, telephone and fax numbers shall be included for Contractor and each subcontractor.

(e) The Final Report, while aiming at optimum specifications and characteristics for the Project, shall identify the availability of prospective U.S. sources of supply. Business name, point of contact, address, telephone and fax numbers shall be included for each commercial source.

(f) The Final Report shall be accompanied by a letter or other notation by the Client which states that the Client approves the Final Report. A certification by the Client to this effect provided on or with the invoice for final payment will meet this requirement.

#### **J. Modifications**

All changes, modifications, assignments or amendments to this contract, including the appendices, shall be made only by written agreement by the parties hereto, subject to written USTDA approval.

#### **K. Study Schedule**

##### **(1) Study Completion Date**

The completion date for the Study, which is February 1, 2011, is the date by which the parties estimate that the Study will have been completed.

## **(2) Time Limitation on Disbursement of USTDA Grant Funds**

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this contract for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.

## **L. Business Practices**

The Contractor agrees not to pay, promise to pay, or authorize the payment of any money or anything of value, directly or indirectly, to any person (whether a governmental official or private individual) for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the Study. The Client agrees not to receive any such payment. The Contractor and the Client agree that each will require that any agent or representative hired to represent them in connection with the Study will comply with this paragraph and all laws which apply to activities and obligations of each party under this Contract, including but not limited to those laws and obligations dealing with improper payments as described above.

## **M. USTDA Address and Fiscal Data**

Any communication with USTDA regarding this Contract shall be sent to the following address and include the fiscal data listed below:

U.S. Trade and Development Agency  
1000 Wilson Boulevard, Suite 1600  
Arlington, Virginia 22209-3901  
USA

Phone: (703) 875-4357  
Fax: (703) 875-4009

### Fiscal Data:

Appropriation No.: 119/101001  
Activity No.: 2009-11014A  
Reservation No.: 2009110018  
Grant No.: GH2009110005

## **N. Definitions**

All capitalized terms not otherwise defined herein shall have the meaning set forth in the Grant Agreement.

**O. Taxes**

USTDA funds provided under the Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country. Neither the Client nor the Contractor will seek reimbursement from USTDA for such taxes, tariffs, duties, fees or other levies.

## ANNEX 5

## Annex I

### **Terms of Reference**

#### **Background:**

Forecasting services in Ghana are provided by the Ghana Meteorological Agency. The multipurpose radar with weather observation capabilities located at Kotoka International Airport is operated by Ghana Civil Aviation Authority (GCAA) and is functioning but not accessible to Ghana Meteorological Agency. Also the ground stations reporting from outside the airport are limited in number, and their reports are prepared and disseminated manually. This creates a safety issue for aviation users that do not have access to state of the art meteorological services to warn of approaching storms, which can be severe, or to detect the wind shear conditions at the airports that are common during severe storms.

The Grantee seeks to enhance its ability to produce timely forecasts and to disseminate either short, medium or long range weather forecasts in an efficient manner. The expansion of the Grantee's meteorological services will: (a) equip all airports with automated weather observation stations ("AWOS") or radar surveillance; (b) input data collected into an automated meteorology database based on Geographic Information Systems (GIS) technology; and (c) communicate meteorological information and weather forecasts efficiently to aviation, agricultural, energy producing, water resource and industrial users. The Project will also establish a central Weather Forecast Office and enhance forecasting by the use of satellite and ground receiving and imaging systems.

This Study is intended to (a) assess the hardware, software, and facilities requirements needed by the Grantee over the next 15 years to enable it to provide state-of-the-art weather forecasts and other meteorological services and (b) recommend changes to its organizational structure to optimize the analysis and dissemination of meteorological information.

#### **Task 1: Kick Off Meeting and Review Reports and Data**

1.1: The Contractor shall obtain and review information concerning Ghana's existing meteorological services. The Contractor shall obtain information from the Grantee, the GCAA, Ghanaian Ministry of Agriculture, U.S. Federal Aviation Administration (FAA), International Civil Aviation Organization (ICAO), and other organizations as appropriate.

1.2: The Contractor shall travel to Ghana to meet with the Grantee in Accra to discuss the basis of the Grantee's Project and the Study's objectives. In addition, the Contractor shall meet with the GCAA, the Ministry of Agriculture, the Ministry of Water Resource Works and Housing, and the Ministry of Energy to discuss each stakeholder's meteorological information and weather forecasting needs and requirements.

1.3: The Contractor shall develop a Work Plan and Timetable for carrying out the Study, and obtain the Grantee's agreement.

Task 1 Deliverable: The Contractor shall provide a written report describing any initial observations, findings and recommendations based on the materials reviewed in Task 1, as well as the Work Plan and Timetable for carrying out the Study. The Task 1 deliverable shall be included in the Final Report.

## **Task 2: Inventory Current Meteorological Systems and Facilities**

The purpose of this Inventory is to gain a full understanding of on-site conditions and of issues related to current equipment and facilities pertaining to meteorological services; airports; and other sites that need to be considered. The Contractor shall identify the adequacies and shortcomings of the existing systems.

2.1: The Contractor shall conduct a detailed field assessment at the airports that have, or are projected to have, significant commercial air traffic in the future. This assessment should include Kotoka International, Kumasi, Sunyani, and Tamale airports, as well as any other site similarly designated by the GCAA and Ghana Airports Company Limited (GACL). The field assessment shall assess each of the identified airport's current equipment, facilities, system configuration, system capabilities, operations, personnel, and training as they pertain to meteorological services.

2.2: The Contractor shall work with the Grantee to develop an inventory of the Grantee's existing equipment and facilities in addition to those identified in Task 2.1. The inventory shall include current equipment, facilities, system configuration, system capabilities, operations, personnel, and training as they pertain to meteorological services.

2.3: The Contractor shall determine the meteorological needs of the agriculture, water resources and energy sector users and shall visit key sites identified in discussions with the key stakeholders identified in Task 1.2 above.

Task 2 Deliverable: The Contractor shall conduct site visits to airports and other key sites to develop an inventory of the Grantee's current meteorological equipment, systems, facilities, and operations, including the shortcomings of existing systems in dealing with current weather forecasting needs. The Task 2 Deliverable shall be included in the Final Report.

### **Task 3: Economic and Socio-Economic Analysis**

3.1: The Contractor shall review information on the types, frequency, and severity of weather related phenomena affecting Ghana. The Contractor's review shall be focused on incorporating an understanding of local weather patterns into the equipment planning and financial analysis included in subsequent tasks of these Terms of Reference.

3.2: The Contractor shall review information on the extent and cost of the damage caused by weather phenomena in Ghana including property damage, injuries and deaths, environmental damage, and the socio-economic implications of such damage. The Contractor shall identify areas where current forecasting and information dissemination capabilities are inadequate to forecast and disseminate information about potentially dangerous or damaging weather phenomena.

Task 3 Deliverable: The Contractor shall report its findings for Task 3 and perform an analysis of the economic and socio-economic benefits associated with the expansion of meteorological services in Ghana. The Task 3 Deliverable shall be included in the Final Report.

### **Task 4: Equipment and Facility Requirements**

4.1: The Contractor shall review the Grantee's estimates of needed equipment and facilities and make recommendations for new equipment and facilities based on the findings of Tasks 1-3. The Contractor's recommendations shall consider the need to accommodate future growth and upgrades to newer technology.

4.2: The Contractor shall assess the adequacy of the Grantee's existing facilities to accommodate the new equipment recommended in Task 4.1 and make recommendations for the upgrade and acquisition of new facilities including land, storage and office space as appropriate.

4.3: The Contractor shall detail the technical specifications, quantities, and requirements for all of the equipment recommended to expand the Grantee's capabilities and to upgrade the Grantee's existing system. The Contractor shall analyze the recommended

equipment, locations and facilities in order to determine the most cost effective solutions considering the Grantee's needs over the next 15 years.

Task 4 Deliverable: The Contractor shall provide a written report which details equipment requirements and specifications, facility locations, and building configurations to accommodate the Grantee's meteorological service needs over the next 15 years. The Task 4 Deliverable shall be included in the Final Report.

### **Task 5: Capital Investment Plan**

The Contractor shall prepare a Capital Investment Plan for the Project that shall include investments required to implement the recommendations of Task 4 including all equipment and civil works related to the Project, as well as the acquisition of radar and monitoring equipment needed by the Grantee's systems to maintain and enhance its capabilities in the future. The Capital Investment Plan shall include estimates for meteorological equipment, communications equipment, civil engineering construction costs, land and building acquisition, fees and expenses, transition costs, and timing of procurements.

Task 5 Deliverable: The Contractor shall provide a detailed Capital Investment Plan for the expansion of meteorological services in Ghana. The Task 5 Deliverable shall be included in the Final Report.

### **Task 6: Preliminary Environmental Impact Assessment**

6.1: The Contractor shall prepare a Preliminary Environmental Impact Assessment that identifies any potential negative and positive impacts resulting from the Project. This Assessment shall include reference to local requirements and requirements of multi-lateral lending agencies, such as the World Bank, and African Development Bank. The Contractor shall make recommendations to mitigate any potentially negative environmental impacts.

Task 6 Deliverable: The Contractor shall prepare a Preliminary Environmental Impact Assessment for Project. The Task 6 Deliverable shall be included in the Final Report.

### **Task 7: Organizational Issues**

7.1: The Contractor shall conduct a review of the Grantee's organizational structure, and the Grantee's plan for the establishment of the central Weather Forecast Office.

7.2: The Contractor shall make recommendations on organizational changes that will be needed by the Grantee in order for it to most effectively provide weather forecasting services to all sectors, including aviation, agriculture, and industry. The Contractor shall identify the management, maintenance, and staff skills required to maintain the meteorological systems consistent with international best practices, and make recommendations on the needed staffing levels over the next five years.

Task 7 Deliverable: The Contractor shall develop recommendations on the optimal organizational structure and staffing of the Grantee's organization and its Weather Forecast Office. The Task 7 Deliverable shall be included in the Final Report.

### **Task 8: Financial Analysis**

8.1: The Contractor shall prepare a Financial Analysis of the Project based on information gathered in previous Tasks. In addition to the Capital Investment Plan prepared in Task 5, the Financial Analysis shall include the costs of capital, and the ongoing costs of operations, including maintenance, staff, training, and other human resource requirements. The Financial Analysis shall address revenues that will be available to fund the Project such as aviation user fees based on the ICAO Manual on Air Navigation Services Economics, and the World Meteorological Organization ("WMO") Guide on Aeronautical Meteorological Services Cost Recovery, among others.

8.2: The Contractor shall prepare a 15-year financial forecast model showing all cash flows and the projected subsidy that may be needed to fully fund the Grantee's operations. The analysis shall be in constant U.S. dollars, and assumptions made by the Contractor in the forecast shall be explained in detail. The Contractor shall test the sensitivity of the projection to factors such as varying costs, inflation, currency prices, financing options, and implementation delays.

Task 8 Deliverable: The Contractor shall prepare a Financial Analysis of the Project. The Task 8 Deliverable shall be included in the Final Report.

### **Task 9: Potential U.S. Sources of Supply**

9.1: The Contractor shall develop an estimate of the potential for procurement of U.S. goods and services for implementation of the Project. The Contractor shall include a list of potential U.S. suppliers and assess their level of interest in the Project. The list shall include U.S. company name, address, personnel contact names with phone and email

addresses, and the goods or services that could be exported in connection with the Project.

Task 9 Deliverable: The Contractor shall develop a list of potential U.S. suppliers of goods and services interested in the Project. The Task 9 Deliverable shall be included in the Final Report.

### **Task 10: Financing Options**

10.1: Based on the findings of Task 8, the Contractor shall determine the amount of capital required from outside sources to implement the Project.

10.2: The Contractor shall identify several potential outside funding sources including the World Bank, African Development Bank, Ex-Im Bank, and other financial institutions with an interest in the Project. The Contractor shall contact each of the identified sources, engage in substantive discussions related to the Project, and determine their interest in financing the Project.

Task 10 Deliverable: The Contractor shall provide a written report which identifies potential sources of financing for the Project. The Task 10 Deliverable shall be included in the Final Report.

### **Task 11: Implementation Plan**

The Contractor shall prepare an Implementation Plan showing the steps necessary to implement the Project and an accompanying timetable. The Implementation Plan and the timetable shall both be developed in a manner consistent with the findings of the Capital Investment Plan developed in Task 5 above.

Task 11 Deliverable: The Contractor shall develop an Implementation Plan and timetable for the Project. The Task 11 Deliverable shall be included in the Final Report.

### **Task 12: Developmental Impact Assessment**

The Contractor shall assess the development benefits associated with the Project. The assessment shall include examples of the development benefits that would be expected in Ghana if the Project is implemented as outlined in the Final Report. The Assessment shall give emphasis to:

*Infrastructure:* improvements in the physical, financial, and social infrastructure of Ghana.

*Technology Transfer and Productivity Improvements:* introduction of advanced technologies and improvement of processes that stimulate greater economic productivity.

*Human Capacity Building:* new job opportunities, sustained employment, or advanced training to upgrade the capability of the workforce.

*Market-Oriented Reforms:* transparency and private sector participation.

*Other/Spin-Off Effects:* any other developmental benefits derived from the Project including, for example, decreased use of aviation fuel because of more-optimized flight routings and increased agricultural production due to better weather forecasting.

Task 12 Deliverable: The Contractor shall provide a detailed assessment of the developmental impact of the Project. The Task 12 Deliverable shall be included in the Final Report.

### **Task 13: Final Report**

13.1: The Contractor shall prepare and deliver to the Grantee a full and complete draft Final Report on all the work performed under these Terms of Reference. The Grantee shall be given the opportunity to make comments and suggestions before the submission of the Final Report.

13.2: The Contractor shall prepare and deliver to the Grantee and USTDA a substantive and comprehensive Final Report of all work performed under these Terms of Reference. The Final Report shall be organized according to the above tasks, and shall include all deliverables and documents that have been provided to the Grantee. The Final Report shall be prepared in accordance with Clause I of Annex II of the Grant Agreement.

#### Notes:

- (1) The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.
- (2) The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.
- (3) The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.