Bidding Document for

Procurement of
Weather Radar for detection of heavy precipitation and other meteorological phenomenon
(Design, Supply, Installation and Commissioning)

Issued on: …../…… 2016

ICB No: PPCR/DHM/G/ICB-29

Employer: Department of Hydrology and Meteorology

Country: Nepal
The Government of Nepal has received financing from the World Bank toward the cost of the Building Resilience to Climate Related Hazards Project (BRCH Project) and intends to apply part of the proceeds toward payments under the contract for “Weather RADAR for Detection of Heavy Precipitation and other Meteorological Phenomenon at Surkhet (Design, Supply, Installation and Commissioning).”

The Department of Hydrology and Meteorology now invites sealed bids from eligible bidders for "Design, Supply, Installation and Commissioning of Weather RADAR for Detection of Heavy Precipitation and other Meteorological Phenomenon" with the components, software and technical features as specified in the bidding document.

1. Bidding will be conducted through the International Competitive Bidding procedures as specified in the World Bank’s Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, January 2011, and is open to all eligible bidders as defined in the Procurement Guidelines. In addition, please refer to paragraphs 1.6 and 1.7 setting forth the World Bank’s policy on conflict of interest.

2. Bidding documents may be purchased from the above office by eligible Bidders upon payment of a nonrefundable fee on the submission of a written application accompanied by a letter of Authority from the firm to the address above along with the copy of Notary Certified Company/Firm registration certificate, PAN/VAT certificate, Tax Clearance certificate for fiscal year 2014/15(2071/72) and Self declaration letter of not being ineligible upto the submission date. The payment mode may be direct deposit or bank transfer to the Gov. Revenue A/c Title No.14227 on Rastriya Baniyja Bank, Thamel, Kathmandu, Nepal or Bankers cheque payable to Department of Hydrology and Meteorology, Kathmandu, Nepal (Office Code No. 27-331-04, A/C No. ka-1-1-001). If so requested, the Bidding Documents can also be sent by courier services/mail upon payment of additional cost of NRs. 12,000.00 (Twelve Thousand Nepalese Rupees) or equivalent. However, the Purchaser will not be responsible for delay or non-delivery of the documents so sent whatsoever the cause thereof.

3. Sealed bids must be submitted to the Procurement Unit of Department of Hydrology and Meteorology. Documents received after submission deadline shall not be accepted.

4. Bids shall be opened in the presence of Bidder's representatives who choose to attend on the opening date given in above Table at the office of Department of Hydrology and Meteorology, P.O.Box 406, Nagpokhari, Naxal, Kathmandu, Nepal. Bids must be valid for a period of 120 days counting from the
day of bid opening and must be accompanied by bid security, amount given in above table, which shall be valid for minimum 30 days beyond the bid validity period (i.e. Total 150 days from the day of bid opening).

5. If the last date of purchasing, submission and opening falls on a government holiday, then the next working day shall be considered the last day. In such a case the bid validity and bid security validity shall be recognized with effect from the original bid submission deadline.

6. Bids should comply in all respects with the Instruction to Bidder included in the Bid Document. Non-compliance with these instructions shall result in disqualification.

7. The Bid, as well as all correspondence and documents relating to the bid submitted by the Bidder shall be written in the English language.

8. A pre-bid meeting shall be held at Purchaser’ address as mention above on date September 11, 2016 in order to clarify any issues or information related to bid.

9. The Department of Hydrology and Meteorology reserves the right to accept or reject, wholly or partly any or all the bids without assigning reason, whatsoever.

10. Eligible Bidders may obtain further information and inspect about the bidding documents at the above office

Attn: Shiva Nepal (Head/Procurement Unit)
Telephone: +977-1-4433477, 4433472, 4436272
E-mail: ppcr.brch@dhm.gov.np,
Website: www.dhm.gov.np,
Standard Bidding Document

Table of Contents

PART 1 – Bidding Procedures
  Section I. Instructions to Bidders ................................. 5
  Section II. Bid Data Sheet ............................................. 33
  Section III. Evaluation and Qualification Criteria (Without Prequalification) ............... 37
  Section IV. Bidding Forms ............................................. 47
  Section V. Eligible Countries ........................................... 87

PART 2 – Employer’s Requirements
  Section VI. Employer’s Requirements .................................. 3

PART 3 – Conditions of Contract and Contract Forms
  Section VII. General Conditions (GC) .................................. 3
  Section VIII. Particular Conditions .................................... 87
  Section IX. Contract Forms ............................................. 93
PART 1 – Bidding Procedures
Single Stage Bidding
# Section I. Instructions to Bidders

## Table of Clauses

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>General</td>
<td>1-7</td>
</tr>
<tr>
<td>1.</td>
<td>Scope of Bid</td>
<td>1-7</td>
</tr>
<tr>
<td>2.</td>
<td>Source of Funds</td>
<td>1-7</td>
</tr>
<tr>
<td>3.</td>
<td>Corrupt Practices</td>
<td>1-7</td>
</tr>
<tr>
<td>4.</td>
<td>Eligible Bidders</td>
<td>1-10</td>
</tr>
<tr>
<td>5.</td>
<td>Eligible Plant and Installation Services</td>
<td>1-12</td>
</tr>
<tr>
<td>B.</td>
<td>Contents of Bidding Document</td>
<td>1-12</td>
</tr>
<tr>
<td>6.</td>
<td>Sections of Bidding Document</td>
<td>1-12</td>
</tr>
<tr>
<td>7.</td>
<td>Clarification of Bidding Document, Site Visit, Pre-Bid Meeting</td>
<td>1-13</td>
</tr>
<tr>
<td>8.</td>
<td>Amendment of Bidding Document</td>
<td>1-14</td>
</tr>
<tr>
<td>C.</td>
<td>Preparation of Bids</td>
<td>1-14</td>
</tr>
<tr>
<td>9.</td>
<td>Cost of Bidding</td>
<td>1-14</td>
</tr>
<tr>
<td>10.</td>
<td>Language of Bid</td>
<td>1-14</td>
</tr>
<tr>
<td>11.</td>
<td>Documents Comprising the Bid</td>
<td>1-15</td>
</tr>
<tr>
<td>12.</td>
<td>Letter of Bid and Schedules</td>
<td>1-15</td>
</tr>
<tr>
<td>13.</td>
<td>Alternative Bids</td>
<td>1-15</td>
</tr>
<tr>
<td>14.</td>
<td>Documents Establishing the Eligibility of the Plant and Installation Services</td>
<td>1-16</td>
</tr>
<tr>
<td>15.</td>
<td>Documents Establishing the Eligibility and Qualifications of the Bidder</td>
<td>1-16</td>
</tr>
<tr>
<td>16.</td>
<td>Documents establishing conformity of the Plant and Installation Services</td>
<td>1-16</td>
</tr>
<tr>
<td>17.</td>
<td>Bid Prices and Discounts</td>
<td>1-17</td>
</tr>
<tr>
<td>18.</td>
<td>Currencies of Bid and Payment</td>
<td>1-20</td>
</tr>
<tr>
<td>19.</td>
<td>Period of Validity of Bids</td>
<td>1-20</td>
</tr>
<tr>
<td>20.</td>
<td>Bid Security</td>
<td>1-20</td>
</tr>
<tr>
<td>21.</td>
<td>Format and Signing of Bid</td>
<td>1-22</td>
</tr>
<tr>
<td>D.</td>
<td>Submission and Opening of Bids</td>
<td>1-23</td>
</tr>
<tr>
<td>22.</td>
<td>Submission, Sealing and Marking of Bids</td>
<td>1-23</td>
</tr>
<tr>
<td>23.</td>
<td>Deadline for Submission of Bids</td>
<td>1-23</td>
</tr>
<tr>
<td>24.</td>
<td>Late Bids</td>
<td>1-24</td>
</tr>
</tbody>
</table>
25. Withdrawal, Substitution, and Modification of Bids ........................................ 1-24
26. Bid Opening ....................................................................................................... 1-24

E. Evaluation and Comparison of Bids ................................................................. 1-25
27. Confidentiality .................................................................................................. 1-25
28. Clarification of Bids .......................................................................................... 1-26
29. Deviations, Reservations, and Omissions ....................................................... 1-26
30. Determination of Responsiveness ................................................................. 1-26
31. Nonmaterial Nonconformities ......................................................................... 1-27
32. Correction of Arithmetical Errors ................................................................... 1-27
33. Conversion to Single Currency ........................................................................ 1-28
34. Margin of Preference ....................................................................................... 1-28
35. Evaluation of Bids ............................................................................................ 1-28
36. Comparison of Bids ........................................................................................ 1-30
37. Eligibility and Qualification of the Bidder ...................................................... 1-30
38. Employer’s Right to Accept Any Bid, and to Reject Any or All Bids .......... 1-31

F. Award of Contract ............................................................................................ 1-31
39. Award Criteria ................................................................................................. 1-31
40. Notification of Award ..................................................................................... 1-31
41. Signing of Contract .......................................................................................... 1-31
42. Performance Security ....................................................................................... 1-32
Section I. Instructions to Bidders

General

1. Scope of Bid 1.1 In connection with the Invitation for Bids indicated in the Bid Data Sheet (BDS), the Employer, as indicated in the BDS, issues this Bidding Document for the procurement of Plant and Installation Services as specified in Section VI, Employer's Requirements. The name, identification, and number of lots (contracts) of the International Competitive Bidding (ICB) are provided in the BDS.

1.2 Unless otherwise stated, throughout this Bidding Document definitions and interpretations shall be as prescribed in the General Conditions, Section VII.

2. Source of Funds 2.1 The Borrower or Recipient (hereinafter called “Borrower”) indicated in the BDS has applied for or received financing (hereinafter called “funds”) from the World Bank (hereinafter called “the Bank”) toward the cost of the project named in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.

2.2 Payments by the Bank will be made only at the request of the Borrower and upon approval by the Bank in accordance with the terms and conditions of the financing agreement between the Borrower and the Bank (hereinafter called the Loan Agreement), and will be subject in all respects to the terms and conditions of that Loan Agreement. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the funds.

2.3 The Loan Agreement prohibits a withdrawal from the loan account for the purpose of any payment to persons or entities, or for any import of equipment, plant, or materials, if such payment or import is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations.

3. Fraud and Corruption 3.1 The Bank requires that Borrowers (including beneficiaries of Bank loans), as well as Bidders, Suppliers, Contractors and their agents (whether declared or not), personnel, subcontractors, sub-consultants, service providers and suppliers, under Bank-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuit of
this policy, the Bank:

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) “corrupt practice” is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party\(^1\);

(ii) “fraudulent practice” is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation\(^2\);

(iii) “collusive practice” is an arrangement between two or more parties\(^3\) designed to achieve an improper purpose, including to influence improperly the actions of another party;

(iv) “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party\(^4\) or the property of the party to influence improperly the actions of a party;

(v) “obstructive practice “is

(aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or

\(^1\)“Another party” refers to a public official acting in relation to the procurement process or contract execution. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

\(^2\)“Party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.

\(^3\)“Parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non-competitive levels.

\(^4\)“Party” refers to a participant in the procurement process or contract execution.
Option A - Section I. Instructions to Bidders

1.9

(bb) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under sub-clause 3.2 below.

(b) will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for the contract in question;

(c) will cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of the loan engaged in corrupt, fraudulent, collusive, or coercive practices during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to the Bank to remedy the situation; and

(d) will sanction a firm or an individual, at any time, in accordance with prevailing Bank’s sanctions procedures, including by publicly declaring such firm or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded a Bank-financed contract; and (ii) to be a nominated sub-contractor, consultant, manufacturer or supplier, or service provider of an otherwise eligible firm being awarded a Bank-financed contract.

3.2 In further pursuance of this policy, Bidders shall permit the Bank to inspect any accounts and records and other documents relating to the Bid submission and contract performance, and to have them audited by auditors appointed by the Bank.

3.3 Furthermore, Bidders shall be aware of the provision stated in the General Conditions (GC 42.2.1(c)).

\[\text{a} \quad \text{A firm or an individual may be declared ineligible to be awarded a Bank-financed contract upon completion of the Bank’s sanctions proceedings as per its sanctions procedures, including inter alia: (i) temporary suspension in connection with an ongoing sanctions proceeding; (ii) cross-debarment as agreed with other International Financial Institutions, including Multilateral Development Banks; and (iii) the World Bank Group corporate administrative procurement sanctions procedures for fraud and corruption.}\]

\[\text{b} \quad \text{A nominated sub-contractor, consultant, manufacturer or supplier, or service provider (different names are used depending on the particular bidding document) is one which either has been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that are accounted for in the evaluation of the bidder’s pre-qualification application or the bid; or (ii) appointed by the Borrower.}\]
4. **Eligible Bidders**

4.1 A Bidder may be a private entity or a government-owned entity—subject to ITB 4.5—or any combination of such entities in the form of a joint venture, or association (JVA) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent. In the case of a joint venture or association:

(a) **unless otherwise specified in the BDS**, all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms, and

(b) the JVA shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the partners of the JVA during the bidding process and, in the event the JVA is awarded the Contract, during contract execution.

4.2 A Bidder, and all partners constituting the Bidder, shall have a nationality of an eligible country as defined in *Guidelines: Procurement under IBRD Loans and IDA Credits*, October 2006, (hereinafter referred to as the Guidelines), in accordance with Section V, Eligible Countries. A Bidder shall be deemed to have the nationality of a country if the Bidder is a national or is constituted, incorporated, or registered and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.

4.3 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

(a) they have a controlling partner in common; or

(b) they receive or have received any direct or indirect subsidy from any of them; or

(c) they have the same legal representative for purposes of this bid; or

(d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or
(e) a Bidder submits more than one bid in this bidding process, either individually or as a partner in a joint venture, except for alternative offers permitted under ITB Clause 13. This will result in the disqualification of all such bids. However, this does not limit the participation of a Bidder as a subcontractor in another bid or of a firm as a subcontractor in more than one bid or

(f) a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the Plant and Installation Services that are the subject of the bid.

(g) a Bidder or any of its affiliates has been hired (or is proposed to be hired) by the Employer or the Borrower as Project Manager for the contract.

4.4 A Bidder that has been sanctioned by the Bank in accordance with the above ITB 3.1 (d), or in accordance with the Bank’s Guidelines on Preventing and Combating Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, shall be ineligible to be awarded a Bank-financed contract, or benefit from a Bank-financed contract, financially or otherwise, during such period of time as the Bank shall determine.

4.5 Government-owned entities in the Borrower’s country shall be eligible only if they can establish that they (i) are legally and financially autonomous, (ii) operate under the principles of commercial law, and (iii) are not dependent agencies of the Employer or the Borrower.

4.6 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.

4.7 In case a prequalification process has been conducted prior to the bidding process, this bidding is open only to prequalified Bidders.

4.8 Firms shall be excluded if:

(a) as a matter of law or official regulation, the Borrower’s country prohibits commercial relations with that country, provided that the Bank is satisfied that such exclusion does not preclude effective competition for the supply of goods or related services required; or
(b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower’s country prohibits any import of goods or contracting of works or services from that country or any payments to persons or entities in that country.

5. Eligible Plant and Installation Services

5.1 The Plant and Installation Services to be supplied under the Contract shall have their origin in eligible source countries as defined in ITB 4.2 above and all expenditures under the Contract will be limited to such Plant and Installation Services.

5.2 For purposes of ITB 5.1 above, “origin” means the place where the plant, or component parts thereof are mined, grown, produced or manufactured, and from which the services are provided. Plant components are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that is substantially in its basic characteristics or in purpose or utility from its components.

Contents of Bidding Document

6. Sections of Bidding Document

6.1 The Bidding Document consists of Parts 1, 2, and 3, which include all the Sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITB 8.

PART 1 Bidding Procedures

- Section I. Instructions to Bidders (ITB)
- Section II. Bid Data Sheet (BDS)
- Section III. Evaluation and Qualification Criteria
- Section IV. Bidding Forms
- Section V. Eligible Countries

PART 2 Employer’s Requirements

- Section VI. Employer’s Requirements

PART 3 Conditions of Contract and Contract Forms

- Section VII. General Conditions (GC)
- Section VIII. Particular Conditions (PC)
- Section IX. Contract Forms
6.2 The Invitation for Bids issued by the Employer is not part of the Bidding Document.

6.3 The Employer is not responsible for the completeness of the Bidding Document and its addenda, if they were not obtained directly from the source stated by the Employer in the Invitation for Bids.

6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the bid.

7. **Clarification of Bidding Document, Site Visit, Pre-Bid Meeting**

7.1 A prospective Bidder requiring any clarification of the Bidding Document shall contact the Employer in writing at the Employer’s address indicated in the BDS or raise his enquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond to any request for clarification, provided that such request is received no later than twenty-eight (28) days prior to the deadline for submission of bids. The Employer’s response shall be in writing with copies to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 8 and ITB 23.2.

7.2 The Bidder is advised to visit and examine the site where the plant is to be installed and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for the provision of Plant and Installation Services. The costs of visiting the site shall be at the Bidder’s own expense.

7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
Here is the plain text representation of the document:

7.4 The Bidder’s designated representative is invited to attend a pre-bid meeting, if provided for in the BDS. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

7.5 The Bidder is requested, as far as possible, to submit any questions in writing, to reach the Employer not later than one week before the meeting.

7.6 Minutes of the pre-bid meeting, including the text of the questions raised without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting.

7.7 Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.

8. **Amendment of Bidding Document**

8.1 At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Document by issuing addenda.

8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from the Employer in accordance with ITB 6.3.

8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may, at its discretion, extend the deadline for the submission of bids, pursuant to ITB 23.2

**Preparation of Bids**

9. **Cost of Bidding**

9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

10. **Language of Bid**

10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer, shall be written in the language specified in the BDS. Supporting documents and printed literature that are part of the Bid may
be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern.

11. Documents Comprising the Bid

11.1 The Bid submitted by the Bidder shall comprise the following:

(a) Letter of Bid

(b) Completed schedules as required, including Price Schedules, in accordance with ITB 12 and 17;

(c) Bid Security or Bid Securing Declaration, in accordance with ITB 20;

(d) alternative bids, if permissible, in accordance with ITB 13;

(e) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 21.2;

(f) documentary evidence established in accordance with ITB 14.1 that the Plant and Installation Services offered by the Bidder in its bid or in any alternative bid, if permitted, are eligible;

(g) documentary evidence in accordance with ITB 15 establishing the Bidder’s eligibility and qualifications to perform the contract if its Bid is accepted;

(h) documentary evidence established in accordance with ITB 16 that the Plant and Installation Services offered by the Bidder conform to the Bidding Document;

(i) in the case of a bid submitted by a JVA, JVA agreement, or letter of intent to enter into a JVA including a draft agreement, indicating at least the parts of the Plant to be executed by the respective partners;

(j) List of subcontractors, in accordance with ITB 16.2; and

(k) any other document required in the BDS.

12. Letter of Bid and Schedules

12.1 The Bidder shall complete the Letter of Bid, including the appropriate Price Schedules, using the relevant forms furnished in Section IV, Bidding Forms. The forms must be completed as instructed in each form.

13. Alternative Bids

13.1 The BDS indicates whether alternative bids are allowed. If they are allowed, the BDS will also indicate whether they are
permitted in accordance with ITB 13.3, or invited in accordance with ITB13.2 and/or ITB 13.4.

13.2 When alternatives to the Time Schedule are explicitly invited, a statement to that effect will be included in the BDS, and the method of evaluating different time schedules will be described in Section III, Evaluation and Qualification Criteria.

13.3 Except as provided under ITB 13.4 below, Bidders wishing to offer technical alternatives to the Employer’s requirements as described in the bidding document must also provide: (i) a price at which they are prepared to offer a plant meeting the Employer’s requirements; and (ii) all information necessary for a complete evaluation of the alternatives by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, and proposed installation methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer.

13.4 When bidders are invited in the BDS to submit alternative technical solutions for specified parts of the facilities, such parts shall be described in Section VI, Employer’s Requirements. Technical alternatives that comply with the performance and technical criteria specified for the Plant and Installation Services shall be considered by the Employer on their own merits, pursuant to ITB 35.

14. Documents Establishing the Eligibility of the Plant and Installation Services

14.1 To establish the eligibility of the Plant and Installation Services in accordance with ITB Clause 5, Bidders shall complete the country of origin declarations in the Price Schedule Forms, included in Section IV, Bidding Forms.

15. Documents Establishing the Eligibility and Qualifications of the Bidder

15.1 To establish its eligibility and qualifications to perform the Contract in accordance with Section III, Evaluation and Qualification Criteria, the Bidder shall provide the information requested in the corresponding information sheets included in Section IV, Bidding Forms.

15.2 Domestic Bidders, individually or in joint ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility as described in ITB 34.

16. Documents establishing conformity of the Plant and

16.1 The Bidder shall furnish the information stipulated in Section IV, in sufficient detail to demonstrate substantial responsiveness of the Bidders’ proposal to the work requirements and the completion time.
### Installation Services

16.2 For major items of Plant and Installation Services as listed by the Employer in Section III, Evaluation and Qualification Criteria, which the Bidder intends to purchase or subcontract, the Bidder shall give details of the name and nationality of the proposed Subcontractors, including manufacturers, for each of those items. In addition, the Bidder shall include in its bid information establishing compliance with the requirements specified by the Employer for these items. Quoted rates and prices will be deemed to apply to whichever Subcontractor is appointed, and no adjustment of the rates and prices will be permitted.

16.3 The Bidder shall be responsible for ensuring that any Subcontractor proposed complies with the requirements of ITB 4, and that any plant, or services to be provided by the Subcontractor comply with the requirements of ITB 5 and ITB 15.1

### 17. Bid Prices and Discounts

17.1 Unless otherwise specified in the BDS, bidders shall quote for the entire Plant and Installation Services on a “single responsibility” basis such that the total bid price covers all the Contractor’s obligations mentioned in or to be reasonably inferred from the bidding document in respect of the design, manufacture, including procurement and subcontracting (if any), delivery, construction, installation and completion of the plant. This includes all requirements under the Contractor’s responsibilities for testing, pre-commissioning and commissioning of the plant and, where so required by the bidding document, the acquisition of all permits, approvals and licenses, etc.; the operation, maintenance and training services and such other items and services as may be specified in the Bidding Document, all in accordance with the requirements of the General Conditions. Items against which no price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed to be covered by the prices for other items.

17.2 Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the bidding document.

17.3 Bidders shall give a breakdown of the prices in the manner and detail called for in the Price Schedules included in Section IV, Bidding Forms.

17.4 Depending on the scope of the Contract, the Price Schedules may comprise up to the six (6) schedules listed below. Separate numbered Schedules included in Section IV, Bidding
Forms, from those numbered 1-4 below, shall be used for each of the elements of the Plant and Installation Services. The total amount from each Schedule corresponding to an element of the Plant and Installation Services shall be summarized in the schedule titled Grand Summary, (Schedule 5), giving the total bid price(s) to be entered in the Letter of Bid.

Schedule No. 1 Plant (including Mandatory Spare Parts) Supplied from Abroad

Schedule No. 2 Plant (including Mandatory Spare Parts) Supplied from within the Employer’s Country

Schedule No. 3 Design Services

Schedule No. 4 Installation Services

Schedule No. 5 Grand Summary (Schedule Nos. 1 to 4)

Schedule No. 6 Recommended Spare Parts

Bidders shall note that the plant and equipment included in Schedule Nos. 1 and 2 above exclude materials used for civil, building and other construction works. All such materials shall be included and priced under Schedule No. 4, Installation Services.

17.5 In the Schedules, bidders shall give the required details and a breakdown of their prices as follows:

(a) Plant to be supplied from abroad (Schedule No. 1):

   The price of the plant shall be quoted on CIP-named place of destination basis as **specified in the BDS**

(b) Plant manufactured within the Employer’s country (Schedule No. 2):

   (i) The price of the plant shall be quoted on an EXW Incoterm basis (such as “ex-works,” “ex-factory,” “ex-warehouse” or “off-the-shelf,” as applicable),

   (ii) Sales tax and all other taxes payable in the Employer’s country on the plant if the contract is awarded to the Bidder, and

   (iii) The total price for the item.

(c) Design Services (Schedule No. 3).

(d) Installation Services shall be quoted separately (Schedule No. 4) and shall include rates or prices for local transportation to named place of final destination as **specified in the BDS**, insurance and other services.
incidental to delivery of the plant, all labor, contractor’s equipment, temporary works, materials, consumables and all matters and things of whatsoever nature, including operations and maintenance services, the provision of operations and maintenance manuals, training, etc., where identified in the Bidding Document, as necessary for the proper execution of the installation and other services, including all taxes, duties, levies and charges payable in the Employer’s country as of twenty-eight (28) days prior to the deadline for submission of bids.

(e) Recommended spare parts shall be quoted separately (Schedule 6) as specified in either subparagraph (a) or (b) above in accordance with the origin of the spare parts.

17.6 The current edition of Incoterms, published by the International Chamber of Commerce shall govern.

17.7 The prices shall be either fixed or adjustable as specified in the BDS.

17.8 In the case of Fixed Price, prices quoted by the Bidder shall be fixed during the Bidder’s performance of the contract and not subject to variation on any account. A bid submitted with an adjustable price quotation will be treated as non responsive and rejected.

17.9 In the case of Adjustable Price, prices quoted by the Bidder shall be subject to adjustment during performance of the contract to reflect changes in the cost elements such as labor, material, transport and contractor’s equipment in accordance with the procedures specified in the corresponding Appendix to the Contract Agreement. A bid submitted with a fixed price quotation will not be rejected, but the price adjustment will be treated as zero. Bidders are required to indicate the source of labor and material indices in the corresponding Form in Section IV, Bidding Forms.

17.10 If so indicated in ITB 1.1, bids are being invited for individual lots (contracts) or for any combination of lots (packages). Bidders wishing to offer any price reduction (discount) for the award of more than one Contract shall specify in their Letter of Bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package, and the manner in which the price reductions will apply.
17.11 Bidders wishing to offer any unconditional discount shall specify in their Letter of Bid the offered discounts and the manner in which price discounts will apply.

18. Currencies of Bid and Payment

18.1 The currency (ies) of the bid shall be, as specified in the BDS.

18.2 Bidders may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements.

19. Period of Validity of Bids

19.1 Bids shall remain valid for the period specified in the BDS after the bid submission deadline date prescribed by the Employer. A bid valid for a shorter period shall be rejected by the Employer as non responsive.

19.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Employer may request Bidders to extend the period of validity of their bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 20, the Bidder granting the request shall also extend the bid security for twenty-eight (28) days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its bid, except as provided in ITB 19.3.

19.3 In the case of fixed price contracts, if the award is delayed by a period exceeding fifty-six (56) days beyond the expiry of the initial bid validity, the Contract price shall be adjusted by a factor or factors specified in the request for extension. Bid evaluation shall be based on the Bid Price without taking into consideration the above correction.

20. Bid Security

20.1 The Bidder shall furnish as part of its bid, either a Bid-Securing Declaration or a bid security as specified in the BDS, in original form and in the amount specified in the BDS.

20.2 A Bid-Securing Declaration shall use the form included in Section IV Bidding Forms.

20.3 If a bid security is specified pursuant to ITB 20.1, the bid security shall be a demand guarantee in any of the following forms at the Bidder’s option:

(a) an unconditional guarantee issued by a bank or surety;

(b) an irrevocable letter of credit;
(c) a cashier’s or certified check; or

(d) another security indicated in the BDS,

from a reputable source from an eligible country. If the unconditional guarantee is issued by an insurance company or a bonding company located outside the Employer’s Country, the issuer shall have a correspondent financial institution located in the Employer’s Country to make it enforceable. In the case of a bank guarantee, the bid security shall be submitted either using the Bid Security Form included in Section IV, Bidding Forms or in another substantially similar format approved by the Employer prior to bid submission. In either case, the form must include the complete name of the Bidder. The bid security shall be valid for twenty-eight days (28) beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 19.2.

20.4 If a bid security is specified pursuant to ITB 20.1, any bid not accompanied by a substantially responsive bid security or Bid-Securing Declaration shall be rejected by the Employer as non-responsive.

20.5 If a bid security is specified pursuant to ITB 20.1, the bid security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder’s furnishing of the performance security pursuant to ITB 42.

20.6 The bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security.

20.7 The bid security may be forfeited or the Bid-Securing Declaration executed:

(a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid or

(b) if the successful Bidder fails to:

(i) sign the Contract in accordance with ITB 41; or

(ii) furnish a performance security in accordance with ITB 42.

20.8 The Bid Security or the Bid Securing Declaration of a JVA shall be in the name of the JVA that submits the bid. If the JVA has not been legally constituted into a legally enforceable JVA at the time of bidding, the Bid Security or the Bid Securing Declaration shall be in the names of all future partners as named in the letter of intent referred to in ITB 4.1.
20.9 If a Bid-Securing Declaration is executed in accordance with ITB 20.7, the Employer will declare the Bidder ineligible to be awarded a contract by the Employer for the period of time stated in the Form of Bid-Securing Declaration.

20.10 If a bid security is not required in the BDS, and

(a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid Form, except as provided in ITB 19.2, or

(b) if the successful Bidder fails to: sign the Contract in accordance with ITB 41; or furnish a performance security in accordance with ITB 42;

the Borrower may, if provided for in the BDS, declare the Bidder disqualified to be awarded a contract by the Employer for a period of time as stated in the BDS.

21. Format and Signing of Bid

21.1 The Bidder shall prepare one original of the documents comprising the bid as described in ITB 11 and clearly mark it “ORIGINAL.” Alternative bids, if permitted in accordance with ITB 13, shall be clearly marked “ALTERNATIVE”. In addition, the Bidder shall submit copies of the bid, in the number specified in the BDS and clearly mark them “COPY.” In the event of any discrepancy between the original and the copies, the original shall prevail.

21.2 The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the bid where entries or amendments have been made shall be signed or initialed by the person signing the bid.

21.3 A bid submitted by a JVA shall comply with the following requirements:

(a) Unless not required in accordance with ITB 4.1 (a), be signed so as to be legally binding on all partners and

(b) Include the Representative’s authorization referred to in ITB 4.1 (b), consisting of a power of attorney signed by those legally authorized to sign on behalf of the JVA.

21.4 Any interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.
Submission and Opening of Bids

22. Submission, Sealing and Marking of Bids

22.1 Bidders may always submit their bids by mail or by hand. When so specified in the BDS, bidders shall have the option of submitting their bids electronically. Procedures for submission, sealing and marking are as follows:

(a) Bidders submitting bids by mail or by hand shall enclose the original and each copy of the Bid, including alternative bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as “ORIGINAL,” “ALTERNATIVE” and “COPY.” These envelopes containing the original and the copies shall then be enclosed in one single envelope. The rest of the procedure shall be in accordance with ITB sub-Clauses 22.2 and 22.3.

(b) Bidders submitting bids electronically shall follow the electronic bid submission procedures specified in the BDS.

22.2 The inner and outer envelopes shall:

(a) bear the name and address of the Bidder;

(b) be addressed to the Employer in accordance with ITB 24.1;

(c) bear the specific identification of this bidding process indicated in accordance with ITB 1.1; and

(d) bear a warning not to open before the time and date for bid opening.

22.3 If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the bid.

23. Deadline for Submission of Bids

23.1 Bids must be received by the Employer at the address and no later than the date and time indicated in the BDS.

23.2 The Employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.
24. Late Bids

24.1 The Employer shall not consider any bid that arrives after the deadline for submission of bids, in accordance with ITB 23. Any bid received by the Employer after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder.

25. Withdrawal, Substitution, and Modification of Bids

25.1 A Bidder may withdraw, substitute, or modify its bid after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 21.2, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the bid must accompany the respective written notice. All notices must be:

(a) prepared and submitted in accordance with ITB 21 and ITB 22 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked “WITHDRAWAL,”“SUBSTITUTION,”“MODIFICATION;” and

(b) received by the Employer prior to the deadline prescribed for submission of bids, in accordance with ITB 23.

25.2 Bids requested to be withdrawn in accordance with ITB 25.1 shall be returned unopened to the Bidders.

25.3 No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid or any extension thereof.

26. Bid Opening

26.1 The Employer shall conduct the bid opening in public, in the presence of Bidders’ designated representatives and anyone who choose to attend, and at the address, date and time specified in the BDS. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 22.1, shall be as specified in the BDS.

26.2 First, envelopes marked “WITHDRAWAL” shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening. Next, envelopes marked “SUBSTITUTION” shall be opened and read out and exchanged with the corresponding bid being substituted, and the substituted bid shall not be opened, but returned to the Bidder. No bid substitution shall be permitted unless the
corresponding substitution notice contains a valid authorization to request the substitution and is read out at bid opening. Envelopes marked “MODIFICATION” shall be opened and read out with the corresponding bid. No bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at bid opening. Only bids that are opened and read out at bid opening shall be considered further.

26.3 All other envelopes shall be opened one at a time, reading out: the name of the Bidder and the Bid Price(s), including any discounts and alternative bids, and indicating whether there is a modification; the presence or absence of a bid security or Bid-Securing Declaration; and any other details as the Employer may consider appropriate. Only discounts and alternative bids read out at bid opening shall be considered for evaluation. No bid shall be rejected at bid opening except for late bids, in accordance with ITB 24.1.

26.4 The Employer shall prepare a record of the bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; the Bid Price, per lot if applicable, including any discounts and alternative bids; and the presence or absence of a bid security or a Bid-Securing Declaration. The Bidders’ representatives who are present shall be requested to sign the record. The omission of a Bidder’s signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted bids in time, and posted online when electronic bidding is permitted.

**Evaluation and Comparison of Bids**

27. **Confidentiality**

27.1 Information relating to the evaluation of bids and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on Contract award is communicated to all Bidders.

27.2 Any attempt by a Bidder to influence the Employer in the evaluation of the bids or Contract award decisions may result in the rejection of its bid.

27.3 Notwithstanding ITB 27.2, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it
should do so in writing.

28. Clarification of Bids

28.1 To assist in the examination, evaluation, and comparison of the bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer’s request for clarification and the response shall be in writing. No change in the prices or substance of the bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids, in accordance with ITB 32.

28.2 If a Bidder does not provide clarifications of its bid by the date and time set in the Employer’s request for clarification, its bid may be rejected.

29. Deviations, Reservations, and Omissions

29.1 During the evaluation of bids, the following definitions apply:

(a) “Deviation” is a departure from the requirements specified in the Bidding Document;

(b) “Reservation” is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and

(c) “Omission” is the failure to submit part or all of the information or documentation required in the Bidding Document.

30. Determination of Responsiveness

30.1 The Employer’s determination of a bid’s responsiveness is to be based on the contents of the bid itself, as defined in ITB11.

30.2 A substantially responsive bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,

(a) if accepted, would:

(i) affect in any substantial way the scope, quality, or performance of the Plant and Installation Services specified in the Contract; or

(ii) limit in any substantial way, inconsistent with the Bidding Document, the Employer’s rights or the Bidder’s obligations under the proposed Contract;
or

(b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive bids.

30.3 The Employer shall examine the technical aspects of the bid in particular, to confirm that all requirements of Section VI, Employer’s Requirements have been met without any material deviation, reservation, or omission.

30.4 If a bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

31. Non material Non conformities

31.1 Provided that a bid is substantially responsive, the Employer may waive any nonconformity in the bid that does not constitute a material deviation, reservation or omission.

31.2 Provided that a bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the price of the bid. Failure of the Bidder to comply with the request may result in the rejection of its bid.

31.3 Provided that a bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component. The adjustment shall be made using the method indicated in Section III, Evaluation and Qualification Criteria.

32. Correction of Arithmetical Errors

32.1 Provided that the bid is substantially responsive, the Employer shall correct arithmetical errors on the following basis:

(a) where there are errors between the total of the amounts given under the column for the price breakdown and the amount given under the Total Price, the former shall prevail and the latter will be corrected accordingly;

(b) where there are errors between the total of the amounts of Schedule Nos. 1 to 4 and the amount given in Schedule No. 5 (Grand Summary), the former shall prevail and the latter will be corrected accordingly; and
(c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

32.2 If the Bidder that submitted the lowest evaluated bid does not accept the correction of errors, its bid shall be declared non-responsive.

33. **Conversion to Single Currency**

33.1 For evaluation and comparison purposes, the currency(ies) of the bid shall be converted into a single currency as **specified in the BDS**.

34. **Margin of Preference**

34.1 No margin of domestic preference shall apply.

35. **Evaluation of Bids**

35.1 The Employer shall use the criteria and methodologies indicated in this Clause. No other evaluation criteria or methodologies shall be permitted.

**Technical Evaluation**

35.2 The Employer will carry out a detailed technical evaluation of the bids not previously rejected to determine whether the technical aspects are in compliance with the Bidding Document. The bid that does not meet minimum acceptable standards of completeness, consistency and detail, and the specified minimum (or maximum, as the case may be) requirements for specified functional guarantees, will be rejected for non responsiveness. In order to reach its determination, the Employer will examine and compare the technical aspects of the bids on the basis of the information supplied by the bidders, taking into account the following:

(a) overall completeness and compliance with the Employer’s Requirements; conformity of the Plant and Installation Services offered with specified performance criteria, including conformity with the specified minimum (or maximum, as the case may be) requirement corresponding to each functional guarantee, as indicated in the Specification and in Section III Evaluation and Qualification Criteria; suitability of the Plant and Installation Services offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the bid;
(b) type, quantity and long-term availability of mandatory and recommended spare parts and maintenance services; and

(c) other relevant factors, if any, listed in Section III, Evaluation and Qualification Criteria.

35.3 Where alternative technical solutions have been allowed in accordance with ITB 13, and offered by the Bidder, the Employer will make a similar evaluation of the alternatives. Where alternatives have not been allowed but have been offered, they shall be ignored.

Economic Evaluation

35.4 To evaluate a bid, the Employer shall consider the following:

(a) the bid price, excluding provisional sums and the provision, if any, for contingencies in the Price Schedules;

(b) price adjustment for correction of arithmetic errors in accordance with ITB 32.1;

(c) price adjustment due to discounts offered in accordance with ITB 17.9 or ITB17.10;

(d) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITB 31.3;

(e) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 33; and

(f) the evaluation factors indicated in Section III, Evaluation and Qualification Criteria.

35.5 If price adjustment is allowed in accordance with ITB 17.6, the estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.

35.6 If this Bidding Document allows Bidders to quote separate prices for different lots (contracts), and the award to a single Bidder of multiple lots (contracts), the methodology to determine the lowest evaluated price of the lot (contract) combinations, including any discounts offered in the Letter of Bid, is specified in Section III, Evaluation and Qualification Criteria.
35.7 If the bid, which results in the lowest Evaluated Bid Price, is seriously unbalanced or front loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Price Schedules, to demonstrate the internal consistency of those prices with the methods and time schedule proposed. After evaluation of the price analyses, taking into consideration the terms of payments, the Employer may require that the amount of the performance security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

36. **Comparison of Bids**

36.1 The Employer shall compare all substantially responsive bids in accordance with ITB 35.4 to determine the lowest evaluated bid.

37. **Eligibility and Qualification of the Bidder**

37.1 The Employer shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated and substantially responsive bid is eligible and meets the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.

37.2 The determination shall be based upon an examination of the documentary evidence of the Bidder’s qualifications submitted by the Bidder, pursuant to ITB 15.

37.3 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the bid, in which event the Employer shall proceed to the next lowest evaluated bid to make a similar determination of that Bidder’s qualifications to perform satisfactorily.

37.4 The capabilities of the manufacturers and subcontractors proposed in its Bid to be used by the lowest evaluated Bidder for identified major items of supply or services will also be evaluated for acceptability in accordance with Section III, Evaluation and Qualification Criteria. Their participation should be confirmed with a letter of intent between the parties, as needed. Should a manufacturer or subcontractor be determined to be unacceptable, the Bid will not be rejected, but the Bidder will be required to substitute an acceptable manufacturer or subcontractor without any change to the bid price. Prior to signing the Contract, the corresponding Appendix to the Contract Agreement shall be completed, listing the approved manufacturers or subcontractors for each item concerned.
38. **Employer’s Right to Accept Any Bid, and to Reject Any or All Bids**

38.1 The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

### Award of Contract

39. **Award Criteria**

39.1 Subject to ITB 38.1, the Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be eligible and qualified to perform the Contract satisfactorily.

40. **Notification of Award**

40.1 Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, that its bid has been accepted. The notification letter (hereinafter and in the Conditions of Contract and Contract Forms called the “Letter of Acceptance”) shall specify the sum that the Employer will pay the Contractor in consideration of the execution and completion of the Plant and Installation Services (hereinafter and in the Conditions of Contract and Contract Forms called “the Contract Price”).

40.2 At the same time, the Employer shall also notify all other Bidders of the results of the bidding, and shall publish in UNDB online and in dgMarket the results identifying the bid and lot numbers and the following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices as read out at Bid Opening; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the Price it offered, as well as the duration and summary scope of the contract awarded.

40.3 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.

40.4 The Employer shall promptly respond in writing to any unsuccessful Bidder who, after notification of award in accordance with ITB 40.2, requests in writing the grounds on which its bid was not selected.

41. **Signing of Contract**

41.1 Promptly upon notification, the Employer shall send the successful Bidder the Contract Agreement.

41.2 Within twenty-eight (28) days of receipt of the Contract
Agreement, the successful Bidder shall sign, date, and return it to the Employer.

41.3 Notwithstanding ITB 41.2 above, in case signing of the Contract Agreement is prevented by any export restrictions attributable to the Employer, to the country of the Employer, or to the use of the Plant and Installation Services to be supplied, where such export restrictions arise from trade regulations from a country supplying those Plant and Installation Services, the Bidder shall not be bound by its bid, always provided, however, that the Bidder can demonstrate to the satisfaction of the Employer and of the Bank that signing of the Contract Agreement has not been prevented by any lack of diligence on the part of the Bidder in completing any formalities, including applying for permits, authorizations and licenses necessary for the export of the Plant and Installation Services under the terms of the Contract.

42. Performance Security

42.1 Within twenty-eight (28) days of the receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security in accordance with the General Conditions, subject to ITB 35.7, using for that purpose the Performance Security Form included in Section IX, Contract Forms, or another form acceptable to the Employer. If the performance security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Employer. A foreign institution providing a performance security shall have a correspondent financial institution located in the Employer’s Country.

42.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security. In that event the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.
# Section II. Bid Data Sheet

## A. Introduction

<table>
<thead>
<tr>
<th>ITB 1.1</th>
<th>The number of the Invitation for Bids is: PPCR/DHM/G/ICB-29</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITB 1.1</td>
<td>The Employer is: <strong>Department of Hydrology and Meteorology</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Building Resilience to Climate Related Hazards Project</strong>,</td>
</tr>
<tr>
<td></td>
<td><strong>Project Management Unit</strong>, Nagpokhari, Kathmandu.</td>
</tr>
<tr>
<td>ITB 1.1</td>
<td>The name of the ICB is: <strong>Design, Supply and Installation of Weather</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Radar for detection of heavy precipitation and other meteorological phenomenon</strong></td>
</tr>
<tr>
<td></td>
<td><em>(Survey, Design, Supply, Delivery, Installation and Commissioning)</em></td>
</tr>
</tbody>
</table>

The identification number of the ICB is: **PPCR/DHM/G/ICB-29**
The number and identification of lots (contracts) comprising this ICB is: **Not applicable**

<table>
<thead>
<tr>
<th>ITB 2.1</th>
<th>The Borrower is: <strong>Government of Nepal</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>ITB 2.1</td>
<td>The name of the Project is: <strong>Building Resilience to Climate Related Hazards Project</strong></td>
</tr>
</tbody>
</table>

## B. Bidding Document

<table>
<thead>
<tr>
<th>ITB 7.1</th>
<th>For <strong>clarification purposes</strong> only, the Employer’s address is:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Attention: <strong>Mr. Shiva Nepal, Chief (Procurement Unit)</strong>,</td>
</tr>
<tr>
<td></td>
<td>Address: <strong>Department of Hydrology and Meteorology</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Building Resilience to Climate Related Hazards Project</strong>,</td>
</tr>
<tr>
<td></td>
<td><strong>Project Management Unit</strong></td>
</tr>
<tr>
<td></td>
<td>Street Address: <strong>Nagpokhari, Naxal</strong>,</td>
</tr>
<tr>
<td></td>
<td>Floor/Room number: <strong>First Floor</strong></td>
</tr>
<tr>
<td></td>
<td>City: <strong>Kathmandu</strong></td>
</tr>
<tr>
<td></td>
<td>ZIP Code: <strong>Not applicable</strong></td>
</tr>
<tr>
<td></td>
<td>Country: <strong>Nepal</strong></td>
</tr>
<tr>
<td></td>
<td>Telephone: +977-1-4433563/44333472</td>
</tr>
<tr>
<td></td>
<td>Facsimile number: +977-1-4433472/4436272</td>
</tr>
<tr>
<td></td>
<td>Electronic mail address: <strong><a href="mailto:ppcr.brch@dhm.gov.np">ppcr.brch@dhm.gov.np</a></strong>;</td>
</tr>
<tr>
<td></td>
<td><strong><a href="mailto:shivaamet@gmail.com">shivaamet@gmail.com</a></strong></td>
</tr>
</tbody>
</table>
**C. Preparation of Bids**

| ITB 7.4 | A Pre-Bid meeting **shall** take place at the following date, time and place:  
| Date: 11 – 09 -2016  
| Time: 02:00 p.m. (NST)  
| Place: DHM/BRCH Project at Meeting Hall  
| A site visit **shall be facilitated** by the Employer: the Employer’s address is  
| Attention:- Nirajan Sapkota (Head)  
| Date and Time:- 13 - 09- 2016 & 12:00 noon NST  
| Place:- Mid and Far western regional climate office, Surkhet  
| Contact No.: 083-520189, 9858052234 |

| ITB 10.1 | The language of the bid is: **English** |
| ITB 11.1 (k) | The Bidder shall submit with its bid the following additional documents:  
| Technical manuals and other documents to which the bidder refers to in the responses to the technical requirements. |

| ITB 13.1 | **Alternative bids are not permitted.** |
| ITB 13.1 | Alternatives to the Time Schedule **shall not** be permitted. |

| ITB 17.1 | Bidders shall quote for the entire plant and services on a single responsibility basis other than the components mentioned below as being under DHM Responsibility.  
| **and**  
| The following components or services will be provided under the responsibility of the Employer: Radar Frequency and transmission license, radiation safety certification, if any, Aviation safety certification, Land acquisition, the electricity connection to site area. |

| ITB 17.5(a) | Named place of destination is: **CIP Kathmandu** |
| ITB 17.5(d) | Named place of final destination is: **Radar site (Guranse Tower, Surkhet)** as listed in Section VI Employer’s Requirements Supplementary Information Maps and Table. |

| ITB 17.7 | The prices quoted by the Bidder shall be: **Fixed** |

| ITB 18.1 | The currency(ies) of the bid shall be as follows:  
| (a) Plant and equipment to be supplied from abroad shall be quoted entirely in the currency of any country. If the bidder wishes to be paid in a combination of amounts in different currencies, it may quote its price |
(a) Accordingly, but use no more than three currencies from any countries.

(b) Plant and equipment to be supplied from within the employer’s country shall be quoted in the currency of the employer’s country.

(c) Design and installation services shall be quoted in either foreign and/or local currency, depending upon the currency in which the costs are to be incurred.

<table>
<thead>
<tr>
<th>ITB 19.1</th>
<th>The bid validity period shall be minimum of 120 days.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITB 20.1</td>
<td>Bid shall include a bid security (issued by bank); The amount of the bid security shall be <strong>NPR 7,020,000 (Seven Million and Twenty Thousand)</strong> or its equivalent in a freely convertible currency.</td>
</tr>
<tr>
<td>ITB 20.3 (d)</td>
<td>Other types of acceptable securities: <strong>None</strong></td>
</tr>
<tr>
<td>ITB 21.1</td>
<td>In addition to the original of the bid, the number of copies is: <strong>Two</strong></td>
</tr>
<tr>
<td>ITB 21.2</td>
<td>The written confirmation of authorization to sign on behalf of the Bidder shall consist of: <strong>Letter of Authorization/ Power of attorney</strong></td>
</tr>
</tbody>
</table>

**D. Submission and Opening of Bids**

| ITB 22.1 | Bidders shall not have the option of submitting their bids electronically. |
| ITB 22.1 (b) | Not applicable |
| ITB 23.1 | For bid submission purposes only, the Employer’s address is:  
Attention: **Mr. Shiva Nepal, Chief of Procurement Unit**  
Street Address: **Department of Hydrology and Meteorology**  
**Building Resilience to Climate Related Hazards Project, Project Management Unit, Nagpokhari, Naxal.**

  Floor/Room number: **Third Floor**  
  City: **Kathmandu**  
  ZIP Code: **Not applicable**  
  Country: **Nepal**

  **The deadline for bid submission is:**
  **Date:** **04-10-2016**
  **Time:** **12:00 noon (local Time)**

| ITB 26.1 | The bid opening shall take place at:  
Street Address: **Department of Hydrology and Meteorology**  
**Building Resilience to Climate Related Hazards Project,**
<table>
<thead>
<tr>
<th><strong>Procurement Unit, Nagpokhari, Naxal.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor/Room number: <strong>Third Floor</strong></td>
</tr>
<tr>
<td>City : Kathmandu</td>
</tr>
<tr>
<td>Country: Nepal</td>
</tr>
<tr>
<td>Date: <strong>04-10-2016</strong></td>
</tr>
<tr>
<td>Time: <strong>13:00 Hrs (local Time)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ITB 26.1</th>
<th>Not Applicable</th>
</tr>
</thead>
</table>

**E. Evaluation, and Comparison of Bids**

<table>
<thead>
<tr>
<th>ITB 33.1</th>
<th>The currency that shall be used for bid evaluation and comparison purposes to convert all bid prices expressed in various currencies into a single currency is: <strong>Nepali rupees (NPR)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The source of exchange rate shall be: <strong>Nepal Rastra Bank</strong></td>
</tr>
<tr>
<td></td>
<td>The date for the exchange rate shall be: <strong>07-09-2016</strong></td>
</tr>
</tbody>
</table>
Section III. Evaluation and Qualification Criteria (Without Prequalification)

This Section contains all the criteria that the Employer shall use to evaluate bids and qualify Bidders. In accordance with ITB 35 and ITB 37, no other factors, methods or criteria shall be used. The Bidder shall provide all the information requested in the forms included in Section IV, Bidding Forms.
1. **Evaluation**

1.1 **Technical Evaluation** (applicable only to Option A, Single Stage Bidding Procedures)

In addition to the criteria listed in ITB 35.2 (a) – (c) the following factors shall apply:

1.2 **Economic Evaluation**

The following factors and methods will apply:

(a) **Time Schedule:**

Time to complete the Plant and Installation Services from the effective date specified in Article 3 of the Contract Agreement for determining time for completion of pre-commissioning activities is: **18 months**. No credit will be given for earlier completion.

(b) **Operating and Maintenance Costs**

Since the operating and maintenance costs of the facilities being procured form a major part of the life cycle cost of the facilities, these costs will be evaluated according to the principles given hereafter, including the cost of spare parts for the initial period of operation stated below and based on prices furnished by each Bidder in Price Schedule Nos. 1 and 2, as well as on past experience of the Employer or other Employers similarly placed. Such costs shall be added to the bid price for evaluation.

Option 1: The operating and maintenance costs factors for calculation of the life cycle cost are:

(i) Number of years for life cycle is 10 years

(ii) Operating costs including

- Electricity cost of the radar system for operative settings defined in the Technical Specification
- Telecommunication cost for the connection proposed by the bidder

(iii) Discount rate for calculation is 10 Percent

(c) **Functional Guarantees of the facilities**

The minimum (or maximum) requirements stated in the Specification for functional guarantees required in the Specification are (the section and requirement number are given in parenthesis. Please refer to the technical section for exact definition of the quantities): Not Applicable
(d) Work, services, facilities, etc., to be provided by the Employer

Where bids include the undertaking of work or the provision of services or facilities by the Employer in excess of the provisions allowed for in the bidding document, the Employer shall assess the costs of such additional work, services and/or facilities during the duration of the contract. Such costs shall be added to the bid price for evaluation.

(e) Specific additional criteria: Not Applicable

1.3 Technical alternatives

- No technical alternatives are permitted, other than those explicitly mentioned in the technical specifications.
## 2. Qualification

<table>
<thead>
<tr>
<th>Sub-Factor</th>
<th>Requirement</th>
<th>Criteria</th>
<th>Bidder</th>
<th>Documentation Required</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Criteria</strong></td>
<td><strong>Bidder</strong></td>
<td><strong>Documentation</strong></td>
<td><strong>Required</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Single Entity</strong></td>
<td><strong>Joint Venture, Consortium or Association</strong></td>
<td><strong>At least one partner</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>All partners combined</strong></td>
<td><strong>Each partner</strong></td>
<td><strong>At least one partner</strong></td>
<td></td>
</tr>
<tr>
<td>2.1.1 Nationality</td>
<td>Nationality in accordance with ITB 4.2.</td>
<td>Must meet requirement</td>
<td>Existing or intended JVA must meet requirement</td>
<td>N / A</td>
<td>Form ELI –1.1 and 1.2, with attachments</td>
</tr>
<tr>
<td>2.1.2 Conflict of Interest</td>
<td>No- conflicts of interests as described in ITB 4.3.</td>
<td>Must meet requirement</td>
<td>Existing or intended JVA must meet requirement</td>
<td>N / A</td>
<td>Letter of Bid</td>
</tr>
<tr>
<td>2.1.3 Bank Ineligibility</td>
<td>Not having been declared ineligible by the Bank as described in ITB 4.4.</td>
<td>Must meet requirement</td>
<td>Existing JVA must meet requirement</td>
<td>N / A</td>
<td>Letter of Bid</td>
</tr>
<tr>
<td>2.1.4 Government Owned Entity</td>
<td>Compliance with conditions of ITB 4.5</td>
<td>Must meet requirement</td>
<td>Must meet requirement</td>
<td>N / A</td>
<td>Form ELI –1.1 and 1.2, with attachments</td>
</tr>
<tr>
<td>2.1.5 Ineligibility based on a United Nations resolution or Borrower’s country law</td>
<td>Not having been excluded as a result of the Borrower’s country laws or official regulations, or by an act of compliance with UN Security Council resolution, in accordance with ITB 4.8</td>
<td>Must meet requirement</td>
<td>Existing JVA must meet requirement</td>
<td>N / A</td>
<td>Letter of Bid</td>
</tr>
</tbody>
</table>
### 2.2 Historical Contract Non-Performance

<table>
<thead>
<tr>
<th>Factor</th>
<th>Sub-Factor</th>
<th>Requirement</th>
<th>Criteria</th>
<th>Bidder</th>
<th>Documentation Required</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.2.1 History of non-performing contracts</td>
<td>Non-performance of a contract did not occur within the last Five (5) years prior to the deadline for application submission, based on all information on fully settled disputes or litigation. A fully settled dispute or litigation is one that has been resolved in accordance with the Dispute Resolution Mechanism under the respective contract, and where all appeal instances available to the bidder have been exhausted.</td>
<td>Must meet requirement by itself or as partner to past or existing JVA</td>
<td>N / A</td>
<td>Must meet requirement by itself or as partner to past or existing JVA</td>
</tr>
<tr>
<td></td>
<td>2.2.2 Pending Litigation</td>
<td>All pending litigation shall in total not represent more than Fifty percent (50%) of the Bidder’s net worth and shall be treated as resolved against the Bidder.</td>
<td>Must meet requirement by itself or as partner to past or existing JVA</td>
<td>N / A</td>
<td>Must meet requirement by itself or as partner to past or existing JVA</td>
</tr>
</tbody>
</table>
## 2.3 Financial Situation

<table>
<thead>
<tr>
<th>Sub-Factor</th>
<th>Requirement</th>
<th>Criteria</th>
<th>Bidder</th>
<th>Documentation Required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.3.1 Historical Financial Performance</strong></td>
<td>Submission of audited balance sheets or if not required by the law of the bidder’s country, other financial statements acceptable to the Employer, for the last Five [5] years to demonstrate the current soundness of the bidders financial position and its prospective long term profitability. (criterion 1) Net worth should be positive. (criterion 2) Profitability in Three (3) years out of last five years</td>
<td>Must meet requirement</td>
<td>N/A</td>
<td>Must meet requirement</td>
</tr>
<tr>
<td><strong>2.3.2 Average Annual Turnover</strong></td>
<td>Minimum average annual turnover of Three million and six hundred Thousand ( 3.6) million US Dollar, calculated as total certified payments received for contracts in progress or completed, within the last Five (5) years</td>
<td>Must meet requirement</td>
<td>Must meet Twenty five percent (25%) of the requirement</td>
<td>Must meet Forty percent (40%) of the requirement</td>
</tr>
</tbody>
</table>
## 2.3 Financial Situation

<table>
<thead>
<tr>
<th>Sub-Factor</th>
<th>Criteria</th>
<th>Bidder</th>
<th>Documentation Required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.3.3 Financial Resources</strong></td>
<td>Requirement</td>
<td>Joint Venture, Consortium or Association</td>
<td>At least one partner</td>
</tr>
<tr>
<td></td>
<td>Single Entity</td>
<td>All partners combined</td>
<td>Each partner</td>
</tr>
<tr>
<td><strong>2.3.3 Financial Resources</strong></td>
<td>The Bidder must demonstrate access to, or availability of, financial resources such as liquid assets, unencumbered real assets, lines of credit, and other financial means, other than any contractual advance payments to meet: (i) the following cash-flow requirement: US Dollar 1 million (One million) and (ii) the overall cash flow requirements for this contract and its current commitments.</td>
<td>Must meet requirement</td>
<td>Must meet Twenty five percent (25%) of the requirement</td>
</tr>
</tbody>
</table>
## 2.4 Experience

<table>
<thead>
<tr>
<th>Sub-Factor</th>
<th>Requirement</th>
<th>Criteria</th>
<th>Bidder</th>
<th>Documentation Required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.4.1 General Experience</strong></td>
<td>Experience under contracts in the role of contractor, subcontractor, or management contractor for at least the last five [5] years prior to the applications submission deadline, and with activity in at least nine (9) months in each year.</td>
<td>Must meet requirement</td>
<td>N / A</td>
<td>Must meet requirement</td>
</tr>
<tr>
<td><strong>2.4.2 Specific Experience</strong></td>
<td>(a) Participation as contractor, management contractor, or subcontractor, in at least three (3) contracts within the last five (5) years, each with a value of at least two million and one hundred sixty thousand US Dollar (2.16 million USD), that have been successfully and substantially completed and that are similar to the proposed.</td>
<td>Must meet requirement</td>
<td>Must meet requirements for all characteristics</td>
<td>N / A</td>
</tr>
<tr>
<td>Factor</td>
<td>Sub-Factor</td>
<td>Criteria</td>
<td>Bidder</td>
<td>Documentation Required</td>
</tr>
<tr>
<td>--------</td>
<td>------------</td>
<td>----------</td>
<td>--------</td>
<td>------------------------</td>
</tr>
<tr>
<td></td>
<td>2.4 Experience</td>
<td>Requirement</td>
<td>Bidder</td>
<td>Documentation Required</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plant and Installation Services. The similarity shall be based on the physical size, complexity, methods/technology or other characteristics as described in Section VI, Employer’s Requirements.</td>
<td>Bidder</td>
<td>Documentation Required</td>
</tr>
<tr>
<td></td>
<td>2.4.2 Specific Experience</td>
<td>(b) For the above or other contracts executed during the period stipulated in 2.4.2(a) above, a minimum experience in the following key activities: Installation of at least 2 (two) C band radars in last 5 years. Minimum of One C-band radar each in two different countries.</td>
<td>Must meet requirements</td>
<td>Must meet requirements</td>
</tr>
</tbody>
</table>
2.5 **Personnel**

The Bidder must demonstrate that it will have the personnel for the key positions that meet the following requirements:

<table>
<thead>
<tr>
<th>No.</th>
<th>Position</th>
<th>Total Work Similar Experience (years)</th>
<th>In Similar Works Experience (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Expert in charge of the radar system</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Expert in charge of the radar tower and civil works</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

The Bidder shall provide details of the proposed personnel and their experience records in the relevant Forms included in Section IV, Bidding Forms.

2.6 **Equipment**

The Bidder must demonstrate that it will have access to the key Contractor’s equipment listed hereafter:

<table>
<thead>
<tr>
<th>No.</th>
<th>Equipment Type and Characteristics</th>
<th>Minimum Number required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Crane or other equipment with sufficient capacity for installation work.</td>
<td>1</td>
</tr>
</tbody>
</table>

The Bidder shall provide further details of proposed items of equipment using the relevant Form in Section IV.

2.7 **Subcontractors**

Subcontractors/manufacturers for the following major items of supply or services must meet the following minimum criteria, herein listed for that item:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description of Item</th>
<th>Minimum Criteria to be met</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Radar tower (about 30m)</td>
<td>Provision of 3 similar metal tower of 20 m height or more.</td>
</tr>
</tbody>
</table>

Failure to comply with this requirement will result in rejection of the subcontractor.

In the case of a Bidder who offers to supply and install major items of supply under the contract that the Bidder did not manufacture or otherwise produce, the Bidder shall provide the manufacturer’s authorization, using the form provided in Section IV, showing that the Bidder has been duly authorized by the manufacturer or producer of the related plant and equipment or component to supply and install that item in the Employer’s country. The Bidder is responsible for ensuring that the manufacturer or producer complies with the requirements of ITB 4 and 5 and meets the minimum criteria listed above for that item.
# Section IV. Bidding Forms

## Table of Forms

<table>
<thead>
<tr>
<th>Form Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter of Bid</td>
<td>49</td>
</tr>
<tr>
<td>Letter of Bid – Single Stage Bidding</td>
<td>49</td>
</tr>
<tr>
<td><strong>Schedules of Rates and Prices</strong></td>
<td>51</td>
</tr>
<tr>
<td>Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad</td>
<td>51</td>
</tr>
<tr>
<td>Schedule No. 2. Plant and Mandatory Spare Parts Supplied from Within the Employer’s Country</td>
<td>53</td>
</tr>
<tr>
<td>Schedule No. 3. Design Services</td>
<td>54</td>
</tr>
<tr>
<td>Schedule No. 4. Installation and Other Services</td>
<td>55</td>
</tr>
<tr>
<td>Schedule No. 5. Grand Summary</td>
<td>56</td>
</tr>
<tr>
<td>Schedule No. 6. Recommended Spare Parts</td>
<td>57</td>
</tr>
<tr>
<td><strong>Technical Proposal</strong></td>
<td>58</td>
</tr>
<tr>
<td>Site Organization</td>
<td>59</td>
</tr>
<tr>
<td>Method Statement</td>
<td>60</td>
</tr>
<tr>
<td>Mobilization Schedule</td>
<td>61</td>
</tr>
<tr>
<td>Construction Schedule</td>
<td>62</td>
</tr>
<tr>
<td>Construction Schedule and its updating</td>
<td>62</td>
</tr>
<tr>
<td>• Survey and Set-up</td>
<td>62</td>
</tr>
<tr>
<td>• Plant</td>
<td>63</td>
</tr>
<tr>
<td><em>(Contractor to elaborate about general plant requirement to perform site works.</em>)</td>
<td>63</td>
</tr>
<tr>
<td>Contractor’s Equipment</td>
<td>64</td>
</tr>
<tr>
<td>Form FUNC</td>
<td>65</td>
</tr>
<tr>
<td>Personnel</td>
<td>66</td>
</tr>
<tr>
<td>Proposed Subcontractors for Major Items of Plant and Installation Services</td>
<td>68</td>
</tr>
<tr>
<td>Form ELI 1.1</td>
<td>69</td>
</tr>
<tr>
<td><strong>Bidder Information Sheet</strong></td>
<td>69</td>
</tr>
<tr>
<td><strong>Party to JVA Information Sheet</strong></td>
<td>70</td>
</tr>
<tr>
<td><strong>Historical Contract Non-Performance</strong></td>
<td>71</td>
</tr>
<tr>
<td><strong>Current Contract Commitments / Works in Progress</strong></td>
<td>72</td>
</tr>
<tr>
<td><strong>Financial Situation</strong></td>
<td>73</td>
</tr>
<tr>
<td>Historical Financial Performance</td>
<td>73</td>
</tr>
</tbody>
</table>
Average Annual Turnover .................................................................75
Financial Resources ........................................................................76

Experience- General Experience .........................................................77
Specific Experience ...........................................................................78
Specific Experience in Key Activities ..................................................80

Form of Bid Security (Bank Guarantee) ..............................................82
Form of Bid Security (Bid Bond)--(NOT APPLICABLE) .........................83
Form of Bid-Securing Declaration (Not Applicable) .............................84
Manufacturer’s Authorization ............................................................85
Letter of Bid

Letter of Bid – Single Stage Bidding

Date: x/x/2016
ICB No.: PPCR/DHM/G/ICB-29
Invitation for Bid No.: ___________ 

To: __________________________________________________________________

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Document, including Addenda issued in accordance with Instructions to Bidders (ITB)8 _______________

(b) We offer to ________________ , in conformity with the Bidding Document, the following Plant and Installation Services: ________________

(c) The price of our Bid, excluding any discounts offered in item (d) below is the sum of: ________________, (_________), and ________________, (________)

(d) The discounts offered and the methodology for their application are: ________________

(e) Our bid shall be valid for a period of ________________ days from the date fixed for the bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(f) If our bid is accepted, we commit to obtain a performance security in accordance with the Bidding Document;

(g) We, including any subcontractors or manufacturers for any part of the contract, have or will have nationalities from eligible countries, in accordance with ITB-4.2;

(h) We, including any subcontractors or manufacturers for any part of the contract, do not have any conflict of interest in accordance with ITB-4.3;

(i) We are not submitting more than one bid in this bidding process as a Bidder, either individually or as a partner in a joint venture, in accordance with ITB-4.3, except for alternative offers permitted under ITB Clause 13;
(j) We, along with any of our subcontractors, suppliers, consultants, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by a member of the World Bank Group or a debarment imposed by the World Bank Group in accordance with the Agreement for Mutual Enforcement of Debarment Decisions between the World Bank and other development banks. Further, we are not ineligible under the Employer’s country laws or official regulations or pursuant to a decision of the United Nations Security Council;

(k) We are not a government owned entity/ We are a government owned entity but meet the requirements of ITB-4.5; 

(l) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract:

<table>
<thead>
<tr>
<th>Name of Recipient</th>
<th>Address</th>
<th>Reason</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(If none has been paid or is to be paid, indicate “none.”)

(m) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and

(n) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

Name ____________________________ In the capacity of ____________________________

Signed ____________________________

Duly authorized to sign the bid for and on behalf of ____________________________

Dated on ____________________________ day of _______________________, ______

---

5Bidder to use as appropriate
# Schedules of Rates and Prices

## Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Code¹</th>
<th>Qty.</th>
<th>Unit Price²</th>
<th>Total Price²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Radar system</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Spares as detailed</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i</td>
<td>Waveguide limiter</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>Waveguide air dehydrator</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Angle encoder elevation</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Angle encoder azimuth</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>Azimuth rotary joint</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>Elevation rotary joint</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vii</td>
<td>Elevation Motor Assembly</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>viii</td>
<td>Azimuth Motor Assembly</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ix</td>
<td>Synthesizer (STALO)</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>Digital Receiver</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xi</td>
<td>LNA Assembly</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xii</td>
<td>Magnetron</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xiii</td>
<td>AC/DC – Power Supply Modules for all voltages used in the radar system</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xiv</td>
<td>Dual-Polswitch</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Radar tower</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Diesel power station</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Measurement equipment set as detailed in Section 1A of the technical requirements (7.1)</td>
<td></td>
<td>1 set (as listed in 7.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>For any items to be priced as per Employers Requirements including training and services all complete</td>
<td></td>
<td>Lump sum</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL (to Schedule No. 5. Grand Summary)

Name of Bidder ____________________________

Signature of Bidder ____________________________
Bidders shall enter a code representing the country of origin of all imported plant and equipment.
Specify currency. Create and use as many columns for Unit Price and Total Price as there are currencies.

Country of Origin Declaration Form

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Code</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Schedule No. 2. Plant and Mandatory Spare Parts Supplied from Within the Employer’s Country

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Qty.</th>
<th>EXW Unit Price(^1)</th>
<th>EXW Total Price(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>((1))</td>
<td>((1) \times (2))</td>
</tr>
<tr>
<td>1</td>
<td>Electricity connection from connection point to Radar system equipment as appropriate. Data connection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL (to Schedule No. 5. Grand Summary)

Name of Bidder _____________________________

Signature of Bidder _____________________________

---

\(^1\) Specify currency in accordance with specifications in Bid Data Sheet under ITB 18.1 in Single Stage Bid, or ITB 30.1 in Two Stage Bid.
# Schedule No. 3. Design Services

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Qty.</th>
<th>Unit Price¹</th>
<th>Total Price¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Design Radar system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Design Installation services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Design Radar tower and Design Tower construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Design Electricity connection from connection point to Radar system equipment as appropriate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Design Data connection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Design Diesel power station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Layout of the equipment room</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL (to Schedule No. 5. Grand Summary)

Name of Bidder  

Signature of Bidder  

¹ Specify currency in accordance with specifications in Bid Data Sheet under ITB 18.1 in Single Stage Bid, or ITB 30.1 in Two Stage Bid.
# Schedule No. 4. Installation and Other Services

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Qty.</th>
<th>Unit Price(^1)</th>
<th>Total Price(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Foreign Currency Portion (1)</td>
<td>Local Currency Portion (2)</td>
</tr>
<tr>
<td>1</td>
<td>Installation of Radar system</td>
<td>Lump Sum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Installation of Radar tower</td>
<td>Lump Sum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Electricity connection work from connection point to Radar system equipment as appropriate</td>
<td>Lump Sum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Data connection services</td>
<td>Lump Sum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Construction of Diesel power station</td>
<td>Lump Sum</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL (to Schedule No. 5. Grand Summary)

Name of Bidder __________________________

Signature of Bidder __________________________

\(^1\) Specify currency in accordance with specifications in Bid Data Sheet under ITB 18.1 in Single Stage Bid, or ITB 30.1 in Two Stage Bid.
## Schedule No. 5. Grand Summary

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Total Price&lt;sup&gt;1&lt;/sup&gt;</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Foreign</td>
</tr>
<tr>
<td>1</td>
<td>Total Schedule No. 1. Plant, and Mandatory Spare Parts Supplied from Abroad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Total Schedule No. 2. Plant, and Mandatory Spare Parts Supplied from Within the Employer’s Country</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Total Schedule No. 3. Design Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Total Schedule No. 4. Installation and Other Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL (to Bid Form)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name of Bidder

Signature of Bidder

---

<sup>1</sup>Specify currency in accordance with specifications in Bid Data Sheet under ITB 18.1 in Single Stage Bid, or ITB 30.1 in Two Stage Bid. Create and use as many columns for Foreign Currency requirement as there are foreign currencies.
## Schedule No. 6. Recommended Spare Parts

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Qty.</th>
<th>Unit Price</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>CIF or CIP (foreign parts)</td>
<td>EXW (local parts)</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name of Bidder

Signature of Bidder
Technical Proposal

- Site Organization
- Method Statement
- Mobilization Schedule
- Construction Schedule
- Plant
- Contractor’s Equipment
- Personnel
- Proposed Subcontractors for Major Items of Plant and Installation Services
- Others
Site Organization

1. Organization at Head-office
2. Organization at Liaison-office, Kathmandu
3. Organization at Site-office
4. Responsibilities of work activities in office
5. Equipment and facilities

The bidder is to elaborate on the above heading and explain how they plan to organize the work.
Method Statement

The bidder (contractor) shall follow the following procedures in addition to what is required in the technical specification

- Provide detailed design documents for each part of the plant to DHM for approval before the works are started.
- Provide all necessary documents which DHM needs in order to receive the approval from the Nepalese authorities (building permission etc. Detailed technical design of the tower shall be submitted at least five weeks in advance for approval by the Employer before commencement of construction.)
- The Bidder is required to obtain the services of a construction engineer certified in Nepal to approve every step of the construction process and quality control. This includes the approval of materials used and meeting specifications as designed.
- Arrange regular progress meetings during the construction and whenever requested by DHM
- At the completion of the work provide detailed documentation of the works to DHM
- Provide all necessary supporting documents which DHM needs to receive the final approval from the concerned authorities for all work.
Mobilization Schedule

Mobilization of Personnel

Mobilization of Equipment

Site Mobilization
Construction Schedule

Construction Schedule and its updating

The bidder shall provide a detailed plan for the construction of the various components of the plant (radar system, radar tower, power station, office building, infrastructure etc.) and update it during the course of the work. The following list is provided as a guideline for the check points to be used.

- Survey and Set-up
- Design and Review of components
- Approval of design
- Construction and Installation mobilization
- completion of construction and installation works
- Review of construction and installation works
- Testing, Fault finding, Commissioning
- Operational acceptance
- Start of Defects liability period
- Routine and preventative maintenance up to end of warranty period.
• **Plant**

  (Contractor to elaborate about general plant requirement to perform site works.)
**Contractor’s Equipment**

**Form EQU**

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key Contractor’s equipment listed in Section III, Evaluation and Qualification Criteria. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.

<table>
<thead>
<tr>
<th>Item of equipment</th>
<th>Equipment information</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crane used for the tower construction and for lifting of the heave equipment</td>
<td>Name of manufacturer</td>
<td>Model and power rating</td>
</tr>
<tr>
<td></td>
<td>Capacity</td>
<td>Year of manufacture</td>
</tr>
<tr>
<td></td>
<td>Current status</td>
<td>Current location</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Details of current commitments</td>
</tr>
<tr>
<td></td>
<td>Source</td>
<td>Indicate source of the equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Owned ☐ Rented ☐ Leased ☐ Specially manufactured</td>
</tr>
</tbody>
</table>

Omit the following information for equipment owned by the Bidder.

<table>
<thead>
<tr>
<th>Owner</th>
<th>Name of owner</th>
<th>Address of owner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Telephone</td>
<td>Contact name and title</td>
</tr>
<tr>
<td></td>
<td>Fax</td>
<td>Telex</td>
</tr>
<tr>
<td>Agreements</td>
<td>Details of rental / lease / manufacture agreements specific to the project</td>
<td></td>
</tr>
</tbody>
</table>
The Bidder shall copy in the left column of the table below, the identification of each functional guarantee required in the Specification and stated by the Employer in para. 1.2 (c) of Section III. Evaluation and Qualification Criteria, and in the right column, provide the corresponding value for each functional guarantee of the proposed plant and equipment.

<table>
<thead>
<tr>
<th>Required Functional Guarantee</th>
<th>Value of Functional Guarantee of the Proposed Plant and Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>
Personnel

Form PER -1

Proposed Personnel

Bidders should provide the names of suitably qualified personnel to meet the specified requirements stated in Section III. The data on their experience should be supplied using the Form below for each candidate.

<table>
<thead>
<tr>
<th></th>
<th>Title of position*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name</td>
</tr>
</tbody>
</table>

*As listed in Section III.
Form PER-2

Resume of Proposed Personnel

<table>
<thead>
<tr>
<th>Name of Bidder</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Position</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Personnel information</th>
<th>Name</th>
<th>Date of birth</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Professional qualifications</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Present employment</th>
<th>Name of employer</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Address of employer</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Company / Project / Position / Relevant technical and management experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Proposed Subcontractors for Major Items of Plant and Installation Services

A list of major items of Plant and Installation Services is provided below.

The following Subcontractors and/or manufacturers are proposed for carrying out the item of the facilities indicated. Bidders are free to propose more than one for each item.

<table>
<thead>
<tr>
<th>Major Items of Plant and Installation Services</th>
<th>Proposed Subcontractors/Manufacturers</th>
<th>Nationality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Form ELI 1.1

Bidder Information Sheet

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>______________________</td>
</tr>
<tr>
<td>ICB No.:</td>
<td>___________________</td>
</tr>
<tr>
<td>Invitation for Bid No.:</td>
<td>________</td>
</tr>
<tr>
<td>Page ________ of _______ pages</td>
<td></td>
</tr>
</tbody>
</table>

1. Bidder’s Legal Name

2. In case of JVA, legal name of each party:

3. Bidder’s actual or intended Country of Registration:

4. Bidder’s Year of Registration:

5. Bidder’s Legal Address in Country of Registration:

6. Bidder’s Authorized Representative Information
   Name:
   Address:
   Telephone/Fax numbers:
   Email Address:

7. Attached are copies of original documents of:
   - Articles of Incorporation or Registration of firm named in 1, above, in accordance with ITB Sub-Clauses 4.1 and 4.2.
   - In case of JVA, letter of intent to form JVA including a draft agreement, or JVA agreement, in accordance with ITB Sub-Clauses 4.1 and 11.1(i) Single Stage Bidding or 11.1(g) Two Stage Bidding.
   - In case of government owned entity from the Employer’s country, documents establishing legal and financial autonomy and compliance with the principles of commercial law, in accordance with ITB Sub-Clause 4.5.

Please note that a written authorization needs to be attached to this sheet as required by ITB 21.2 Single Stage Bidding) or ITB 17.2 Two Stage Bidding
Form ELI 1.2

Party to JVA Information Sheet

Date: ______________________
ICB No.: ___________________
Invitation for Bid No.:_________
Page ________ of_ _______ pages

1. Bidder’s Legal Name:

2. JVA’s Party legal name:

3. JVA’s Party Country of Registration:

4. JVA’s Party Year of Registration:

5. JVA’s Party Legal Address in Country of Registration:

6. JVA’s Party Authorized Representative Information
   Name:
   Address:
   Telephone/Fax numbers:
   Email Address:

7. Attached are copies of original documents of:
   □ Articles of Incorporation or Registration of firm named in 1, above, in accordance with ITB Sub-Clauses 4.1 and 4.2.
   □ In case of government owned entity from the Purchaser’s country, documents establishing legal and financial autonomy and compliance with the principles of commercial law, in accordance with ITB Sub-Clause 4.5.
Form CON – 2

Historical Contract Non-Performance

In case a prequalification process was conducted this form should be used only if the information submitted at the time of prequalification requires updating

Bidder’s Legal Name: _______________________
JVA Partner Legal Name: _______________________
ICB No.: _______________________

<table>
<thead>
<tr>
<th>Contract Identification</th>
<th>Outcome as Percent of Total Assets</th>
<th>Year</th>
<th>Total Contract Amount (current value, US$ equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pending Litigation, in accordance with Section III, Evaluation Criteria

☐ No pending litigation in accordance with Sub-Factor 2.2.2 of Section III, Evaluation Criteria

☐ Pending litigation in accordance with Sub-Factor 2.2.2 of Section III, Evaluation Criteria, as indicated below

<table>
<thead>
<tr>
<th>Year</th>
<th>Contract Identification</th>
<th>Name of Employer</th>
<th>Address of Employer</th>
<th>Matter in dispute</th>
<th>Total Contract Amount (current value, US$ equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Form CCC

**Current Contract Commitments / Works in Progress**

Bidders and each partner to a JVA should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

<table>
<thead>
<tr>
<th>Name of contract</th>
<th>Employer, contact address/tel/fax</th>
<th>Value of outstanding work (current US$ equivalent)</th>
<th>Estimated completion date</th>
<th>Average monthly invoicing over last six months (US$/month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Form FIN – 3.1

Financial Situation

Historical Financial Performance

Bidder’s Legal Name: _______________________
JVA Partner Legal Name: _______________________

Date: ___________________
ICB No.: ______________

Page _____ of _______ pages

To be completed by the Bidder and, if JVA, by each partner

<table>
<thead>
<tr>
<th>Financial information in US$ equivalent</th>
<th>Historic information for previous _____ (__) years (US$ equivalent in 000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 1</td>
</tr>
</tbody>
</table>

Information from Balance Sheet

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Assets (TA)</td>
<td></td>
</tr>
<tr>
<td>Total Liabilities (TL)</td>
<td></td>
</tr>
<tr>
<td>Net Worth (NW)</td>
<td></td>
</tr>
<tr>
<td>Current Assets (CA)</td>
<td></td>
</tr>
<tr>
<td>Current Liabilities (CL)</td>
<td></td>
</tr>
</tbody>
</table>

Information from Income Statement

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Revenue (TR)</td>
<td></td>
</tr>
<tr>
<td>Profits Before Taxes (PBT)</td>
<td></td>
</tr>
</tbody>
</table>
Attached are copies of financial statements (balance sheets, including all related notes, and income statements) for the years required above complying with the following conditions:

(a) Must reflect the financial situation of the Bidder or partner to a JVA, and not sister or parent companies

(b) Historic financial statements must be audited by a certified accountant

(c) Historic financial statements must be complete, including all notes to the financial statements

(d) Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted)
Form FIN – 3.2

**Average Annual Turnover**

Bidder’s Legal Name: ___________________________  Date: __________________
JVA Partner Legal Name: ___________________________  ICB No.: __________________

Page _______ of _______ pages

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount and Currency</th>
<th>US$ equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Average Annual Construction Turnover |

*Average annual turnover calculated as total certified payments received for work in progress or completed, divided by the number of years specified in Section III, Evaluation Criteria, Sub-Factor 2.3.2.
Form FIN3.3

Financial Resources

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as indicated in Section III, Evaluation and Qualification Criteria.

<table>
<thead>
<tr>
<th>Source of financing</th>
<th>Amount (US$ equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>
Form EXP 2.4.1

Experience- General Experience

Bidder’s Legal Name: ____________________________ Date: _____________________
JVA Partner Legal Name: ____________________________ ICB No.: ________________

Page _______ of _______ pages

<table>
<thead>
<tr>
<th>Starting Month / Year</th>
<th>Ending Month / Year</th>
<th>Years *</th>
<th>Contract Identification</th>
<th>Role of Bidder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contract name:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brief Description of the Works performed by the Bidder:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Name of Employer:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contract name:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brief Description of the Works performed by the Bidder:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Name of Employer:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contract name:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brief Description of the Works performed by the Bidder:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Name of Employer:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contract name:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brief Description of the Works performed by the Bidder:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Name of Employer:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*List calendar year for years with contracts with at least nine (9) months activity per year starting with the earliest year
Form EXP – 2.4.2(a)

**Specific Experience**

Bidder’s Legal Name: ___________________________  Date: _____________________
JVA Partner Legal Name: ___________________________  ICB No.: __________________

Page _______ of _______ pages

<table>
<thead>
<tr>
<th>Similar Contract Number: ___ of ___ required.</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Identification</td>
<td>____________</td>
</tr>
<tr>
<td>Award date</td>
<td>____________</td>
</tr>
<tr>
<td>Completion date</td>
<td>____________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role in Contract</th>
<th>Contractor</th>
<th>Management Contractor</th>
<th>Subcontractor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total contract amount</th>
<th>US$_______</th>
</tr>
</thead>
<tbody>
<tr>
<td>____________</td>
<td>__________</td>
</tr>
</tbody>
</table>

If partner in a JVA or subcontractor, specify participation of total contract amount

<table>
<thead>
<tr>
<th>%</th>
<th>____________</th>
<th>US$_______</th>
</tr>
</thead>
<tbody>
<tr>
<td>____________</td>
<td>____________</td>
<td>__________</td>
</tr>
</tbody>
</table>

Employer’s Name:

__________

Address:

__________

Telephone/fax number:

__________

E-mail:

__________
Form EXP – 2.4.2(a) (cont.)

Specific Experience (cont.)

Bidder’s Legal Name: ___________________________  Page _____ of _____ pages
JVA Partner Legal Name: ___________________________

<table>
<thead>
<tr>
<th>Similar Contract No. ___[insert specific number] of [total number of contracts] ___ required</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of the similarity in accordance with Sub-Factor 2.4.2a) of Section III:</td>
<td></td>
</tr>
<tr>
<td>Amount</td>
<td></td>
</tr>
<tr>
<td>Physical size</td>
<td></td>
</tr>
<tr>
<td>Complexity</td>
<td></td>
</tr>
<tr>
<td>Methods/Technology</td>
<td></td>
</tr>
<tr>
<td>Physical Production Rate</td>
<td></td>
</tr>
</tbody>
</table>
Form EXP – 2.4.2(b)

Specific Experience in Key Activities

Bidder’s Legal Name: ___________________________  Date: _____________________
JVA Partner Legal Name: ___________________________  ICB No.: ________________
Subcontractor’s Legal Name: _______________  Page _______ of _______ pages

<table>
<thead>
<tr>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Identification</td>
</tr>
<tr>
<td>Award date</td>
</tr>
<tr>
<td>Completion date</td>
</tr>
<tr>
<td>Role in Contract</td>
</tr>
<tr>
<td>Contractor</td>
</tr>
<tr>
<td>Management Contractor</td>
</tr>
<tr>
<td>Subcontractor</td>
</tr>
<tr>
<td>Total contract amount</td>
</tr>
<tr>
<td>If partner in a JVA or subcontractor, specify participation of total contract amount</td>
</tr>
<tr>
<td>Employer’s Name:</td>
</tr>
<tr>
<td>Address:</td>
</tr>
<tr>
<td>Telephone/fax number:</td>
</tr>
<tr>
<td>E-mail:</td>
</tr>
</tbody>
</table>
Form EXP – 2.4.2 (b)(cont.)

Specific Experience in Key Activities (cont.)

Bidder’s Legal Name: ___________________________   Page _______ of _______ pages
 JVAPartner Legal Name: __________________________
 Subcontractor’s Legal Name: __________________________

<table>
<thead>
<tr>
<th>Description of the key activities in accordance with Sub-Factor 2.4.2b) of Section III:</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Form of Bid Security (Bank Guarantee)

__________________________

Beneficiary: __________________________

Date: __________________________

BID GUARANTEE No.: __________________________

We have been informed that __________________________ (hereinafter called “the Bidder”) has submitted to you its bid dated ___________ (hereinafter called “the Bid”) for the execution of ________________ under Invitation for Bids No. ___________ (“the IFB”).

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we ____________________ hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of ___________ (____________) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

(a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Form of Bid; or

(b) having been notified of the acceptance of its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Contract Form, if required, or (ii) fails or refuses to furnish the performance security, in accordance with the ITB.

This guarantee will expire: (a) if the Bidder is the successful Bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; and (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy your notification to the Bidder of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of the Bidder’s bid.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

[signature(s)]
Form of Bid Security (Bid Bond)---(NOT APPLICABLE)

BOND NO. ______________________

BY THIS BOND _______________ as Principal (hereinafter called “the Principal”), and _______________, authorized to transact business in _______________, as Surety (hereinafter called “the Surety”), are held and firmly bound unto _______________ as Obligee (hereinafter called “the Employer”) in the sum of ____________ ($__________), for the payment of which sum, well and truly to be made, we, the said Principal and Surety, bind ourselves, our successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has submitted a written Bid to the Employer dated the ___ day of ______, 20__, for the construction of _______________ (hereinafter called the “Bid”).

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal:

(a) withdraws its Bid during the period of bid validity specified in the Form of Bid; or

(b) having been notified of the acceptance of its Bid by the Employer during the period of Bid validity; (i) fails or refuses to execute the Contract Form, if required; or (ii) fails or refuses to furnish the Performance Security in accordance with the Instructions to Bidders;

then the Surety undertakes to immediately pay to the Employer up to the above amount upon receipt of the Employer’s first written demand, without the Employer having to substantiate its demand, provided that in its demand the Employer shall state that the demand arises from the occurrence of any of the above events, specifying which event(s) has occurred.

The Surety hereby agrees that its obligation will remain in full force and effect up to and including the date 28 days after the date of expiration of the Bid validity as stated in the Invitation to Bid or extended by the Employer at any time prior to this date, notice of which extension(s) to the Surety being hereby waived.

IN TESTIMONY WHEREOF, the Principal and the Surety have caused these presents to be executed in their respective names this ____ day of ____________ 20__. 

Principal: ______________________

Surety: ____________________________

Corporate Seal (where appropriate)

_________________________ (Signature)

_________________________ (Signature)

(Printed name and title) (Printed name and title)

---

6 The amount of the Bond shall be denominated in the currency of the Employer’s country or the equivalent amount in a freely convertible currency.
Form of Bid-Securing Declaration (Not Applicable)

Date: ________________
Bid No.: ________________
Alternative No.: ________________

To: _____________________________________

We, the undersigned, declare that:

We understand that, according to your conditions, bids must be supported by a Bid-Securing Declaration.

We accept that we will automatically be suspended from being eligible for bidding in any contract with the Borrower for the period of time of ________________, starting on _____________, if we are in breach of our obligation(s) under the bid conditions, because we:

(a) have withdrawn our Bid during the period of bid validity specified in the Letter of Bid; or

(b) having been notified of the acceptance of our Bid by the Employer during the period of bid validity, (i) fail or refuse to execute the Contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the ITB.

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of our Bid.

Signed: ___________________________________
In the capacity of __________________________

Name: __________________________________________________

Duly authorized to sign the bid for and on behalf of: ______________________

Dated on ____________ day of ________________, ______

__________________________________
Corporate Seal (where appropriate)
Manufacturer’s Authorization

Date: ____________________
ICB No.: ________________

To: _______________________

WHEREAS

We ________________, who are official manufacturers of __________________, having factories at ____________________, do hereby authorize _________________ to submit a bid the purpose of which is to provide the following goods, manufactured by us ____________________, and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 27 of the General Conditions, with respect to the goods offered by the above firm.

Signed: _____________________________

Name: _______________________________

Title: _______________________________

Duly authorized to sign this Authorization on behalf of:

_______________________________

Dated on __________ day of ______________, _______
Section V. Eligible Countries

A bidder and all parties constituting the Bidder shall have the nationality of an eligible country as defined by the concerned WB for WB funded projects.
PART 2 – Employer’s Requirements
Section VI. Employer’s Requirements

Contents

Scope of Supply of Plant and Installation Services by the Contractor .......................... 2-4
Specification.................................................................................................................. 2-5
Forms and Procedures................................................................................................. 2-50
  Form of Completion Certificate................................................................................... 2-61
  Form of Operational Acceptance Certificate ............................................................. 2-62
  Change Order Procedure and Forms......................................................................... 2-63
  Change Order Procedure............................................................................................ 2-64
  
  Annex 1. Request for Change Proposal ................................................................... 2-65
  Annex 2. Estimate for Change Proposal................................................................. 2-66
  Annex 3. Acceptance of Estimate............................................................................ 2-69
  Annex 4. Change Proposal....................................................................................... 2-70
  Annex 5. Change Order............................................................................................ 2-73
  Annex 6. Pending Agreement Change Order ......................................................... 2-74
  Annex 7. Application for Change Proposal ............................................................. 2-76
Drawings....................................................................................................................... 2-77
Supplementary Information ......................................................................................... 78
Scope of Supply of Plant and Installation Services by the Contractor
Specification

Department of Hydrology and Meteorology of Nepal (DHM) intends to acquire a Weather Radar as part of the project Building Resilience to the Climate Related Hazards funded by the World Bank. The objectives of the weather radar system are to (1) enable real-time and accurate monitoring of precipitation intensities, wind profiles and other wind products as well as other products based on radar raw data, (2) enable safety services by real-time availability of weather radar data, and (3) enable scientific research and risk analysis using an archive of radar data and products in Nepal.

Based on its experiences, the Finnish-Nepalese project FNEP I pointed out the urgency of continuous access of weather radar data. DHM has plan to install a nationwide weather radar network. The procurement of the first of these radars is included in the PPCR-Building Resilience to Climate-Related Hazards project.

The geometry of Nepal is challenging for a weather radar network because of the highly variable orography, which also possesses difficulties for power and telecommunication. Furthermore, in remote areas the security of the sites comes in question. The first radars are built on the southern edges of the middle mountains, with aims of monitoring the monsoon and the westerly winter disturbance.

The following sections are part the Specifications for a Weather Radar System:

- Section 1A specifying the general technical requirements
- Section 1B specifying the radar transmitter system requirements
- Section 1C specifying requirements for the radar receiver, signal processor and data handling
- Section 1D specifying requirements for documentation, training, environmental system, building and installation services

MANDATORY: The bidder shall clearly mark in its response to each of the requirements the annex and page number where the evidence for the response is found.

COMPLY □
SECTION 1A: GENERAL TECHNICAL REQUIREMENTS FOR HARDWARE AND SOFTWARE

1 Introduction

This section describes the general technical requirements for all equipment to be supplied by the bidders.

DHM intends to create a radar network which covers most of Nepal. As a first step, a single C-band Polari metric radar will be acquired. The present invitation to tender specifies the radar system, the radar tower, the radar data center servers, and radar workstations, and telecommunication system between the radar and radar data server, and other related items. DHM aims at executing the project as a turnkey project, in which the bidder supplies a fully functioning radar system, with all the civil works included. The radar stations will operate unattended, and the control and surveillance of the radar system will take place through the telecommunications links to the station.

The radar will be installed in Guranse Tower Hill, Surkhet, Nepal (28° 40’ 29” N, 81° 38’ 19” E, preliminary location, to be confirmed). Potential Bidders will have an opportunity for a site-visit after Prebid meeting but before submission of the bid as stipulated and at their own cost.

<table>
<thead>
<tr>
<th>The scope of the ITT covers e.g. the following</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. One C-band Polari metric weather radar</td>
</tr>
<tr>
<td>2. Workstations and software for management of radar, for acquisition of raw data from the radar, for generation, dissemination, display of products and for archiving of raw data and products,</td>
</tr>
<tr>
<td>3. Construction of radar tower and buildings</td>
</tr>
<tr>
<td>4. Provision of environmental systems</td>
</tr>
<tr>
<td>5. Provision of telecommunication system between radar and the radar operation center</td>
</tr>
<tr>
<td>6. Carrying out all civil works and fencing the area</td>
</tr>
<tr>
<td>7. Supply of spare parts and test equipment</td>
</tr>
<tr>
<td>8. Supply of maintenance services during the warranty period</td>
</tr>
<tr>
<td>9. Supply of documentation and manuals</td>
</tr>
</tbody>
</table>

1.1 Delivery and completion schedules

1.1 MANDATORY The overall time period from the effective date specified in Article 3 of the Contract Agreement to the final acceptance is 18 months.

A project execution plan shall be provided by the bidder. The plan contains the manufacturing, delivery, installation and commission schedule and well as the proposed training program. The bidder shall provide revisions to the program when necessary.
1.2 **Quality assurance**

1.2 a **MANDATORY** The Company shall have the approved ISO 9001 Quality Assurance System certified by an accredited authority. The copy of this certificate must be attached to the technical proposal.

1.2 b **MANDATORY** As a manufacturer of products for environmental measurement, the bidder shall have a process to minimize the environmental impacts of its operation, the prevention of pollution and the reduction of waste. This process shall conform to the requirements of an environmental management standard such as the EN ISO14001 or equivalent. The conformance certificate shall be included with the bid.

1.2 c **MANDATORY** As a part of their Quality Assurance System, the bidder shall operate the laboratory facilities for sensor testing and calibration. These facilities and the primary standards used shall be traceable to the international standards. Both the quality assurance system and the internationally traceable standards shall be documented in writing in the technical proposal.

1.3 **Standards**

1.3 a **MANDATORY** Wherever reference is made in the Technical Specifications to specific standards and codes to be met by the goods and materials to be furnished or tested, the provisions of the latest current edition or revision of the relevant standards or codes in effect shall apply, unless otherwise agreed.

Where such standards and codes are national or relate to a particular country or region, other authoritative standards that ensure substantial equivalence to the standards and codes specified will be acceptable.

1.3 b **MANDATORY** The SI system of units is used throughout.

1.4 **Delivery and installation**

1.4 a **MANDATORY** The bidder shall be responsible for loading, transporting, shipping and unloading of the equipment to be supplied under the contract from the point of manufacture to the final destination of delivery. The bidder shall also be responsible for any storage of the equipment in Nepal during any interim period between supply and transportation to field locations for
installation.
The bidder shall provide such packing of the equipment as is required to prevent any damage or deterioration of goods during the delivery to the final destination.

1.4 b MANDATORY All accessories, tools and fixtures required for installation and dismounting/remounting of the equipment shall be treated as a part of the supply for each type of equipment.

2 Physical Construction and Architecture

2.1 Materials

2.1.a MANDATORY - only material, components and workmanship of a high grade shall be employed. The equipment shall be robustly designed and the maker’s ratings of all components which it uses shall not be exceeded under the conditions stated in this specification.

2.1.b VERIFICATION - the bidders shall state any standard it fulfils and uses for mechanical construction, electrical components and production of the goods. Any national or military standard used by the bidders shall also be stated. The bidder shall submit standards to be used as an ‘annex’.

2.1.b MANDATORY - the bidders shall list manufacturers of the following components and sub-systems and state the standards used by these manufacturers as an ‘annex’.

1) Antenna
2) Antenna pedestal
3) Radome
4) Modulator
5) Transmitter tube
6) Receiver, front-end
7) Receiver, digital part
8) Signal processor
9) Azimuth and elevation rotary joints
10) Dual polarization switch (i.e. H ↔ H + V switch)

2.2 Construction

2.2 MANDATORY - modular construction shall be employed using connectors suitable for repeated changes without impairing their efficiency. The connections within the equipment where separation of parts may be required shall be equipped with plugs and sockets adequately rated for the purpose. Plug and socket connections shall be keyed or polarized to prevent incorrect mating.
2.3 System Architecture

2.3 MANDATORY - all sub-systems shall integrate with each other to form a complete functional system.

2.3 VERIFICATION - the bidders shall describe the architecture of the complete system at a block diagram level. This shall include description of the architecture of the main sub-systems and interfaces between sub-systems and modules. In addition, at least the following points shall be described:

1) the main software modules needed for operation of the radar
2) whether centralized or distributed processing is used for the main software modules
3) interface and bus standards used between the main sub-system connections
4) radar’s internal test and supervision system architecture for monitoring of the operation of the radar
5) telecommunication standards
The bidder shall submit above points in detail as an ‘annex’.

2.4 Labelling

2.4 MANDATORY - all labelling shall use alphanumeric English characters.

2.4.1 Plug, Socket and Cable Labelling

2.4.1 MANDATORY - all plugs, sockets and cabling shall be marked in such a way that ambiguity in locating the mating connector is avoided.

2.4.2 Printed Circuit Board (PCB) Labelling

2.4.2 MANDATORY - all PCBs shall be labelled with the type of PCB, a serial number and the date of manufacturing.

2.4.3 Module Labelling

2.4.3 MANDATORY - each module shall be labelled with the name/code of the module, and the serial number and the date of manufacturing.
3 Environment

3.1 General

3.1 MANDATORY - all metal surfaces shall be treated against corrosion with a treatment appropriate for the metal. Effects of solar radiation on appropriate surfaces shall also to be minimized.

3.1 VERIFICATION - the bidders shall state the materials, methods and standards used for the treatment of the metal surfaces. The bidder shall submit details stated above as an ‘annex’.

3.2 Operational Environment

3.2.a MANDATORY - the radar system enclosed inside the radome shall be capable of continuous operation in outside temperatures ranging from -40°C to +40°C and in outside relative humidity of up to 100%.

3.2.b MANDATORY - systems other than radar antenna environment shall be capable of operating in temperatures from +5°C to +35°C in relative humidity between 10% - 95%.

3.2.a & b VERIFICATION - Any component or subsystem needing heat compensation, heating or air conditioning to control the environment in which this component or subsystem operate shall be stated. Technical solutions used to control these environments shall also be specified. The bidder shall submit Operating condition to be used as an ‘annex’.

3.2.c MANDATORY - Maximum wind figures are for continuous steady wind 50 m/s and 65 m/s for gusts. Radome has to be designed to withstand at least these wind speeds.

3.2.c VERIFICATION - the bidders shall state the wind figures the radome has been designed to withstand. And provide wind figures as an ‘annex’
3.3 Environmental Conditions during Transport and Storage

The maximum time for storage is two years.

3.3 MANDATORY - during transport the equipment shall withstand temperatures from -40°C to +40°C and relative humidity from 20% to 100%. Suitable transport packings, which shall be dust-tight, shall be employed. During storage the equipment shall withstand temperatures from -40°C to +40°C, and relative humidity from 20% to 100%.

3.4 Audible Equipment Noise

3.4 MANDATORY - noise produced by the equipment shall be such as not to impair the working environment.

3.4 VERIFICATION - Bidders shall state the expected or measured noise sound level in dBA at a distance of one metre from each equipment rack and mention in an ‘annex’.

4 Electrical and Transient Interference

4.1 Lightning Protection

4.1.a MANDATORY - lightning protection system shall be provided for the radome. In addition to a catching rod on top of the radome a sufficient number of catching rod shall be included along the lower edge of the radome. The rods shall be installed so that they do not unnecessarily affect the quality of the polarimetric measurement.

4.1.a VERIFICATION - the implementation principles, standards used and practice to be observed in the lightning protection offered shall be stated in an ‘annex’.

4.1.b MANDATORY - the bidders shall provide adequate lightning protection to be used on and between the various units, e.g. antenna and transceiver, and for external line interfaces.

4.1.b VERIFICATION - the bidders shall state the methods and standards used in protecting the various units of the radar from the effects of lightning and stated in an ‘annex’.
Section VI. Employer’s Requirements

4.2 Electrostatic Protection

4.2 MANDATORY - the bidders shall implement the necessary antistatic procedures and materials to ensure the equipment is not damaged by electrostatic discharge.

4.2 VERIFICATION - procedures and the standards used for electrostatic protection shall be stated in an ‘annex’.

4.3 Electromagnetic Compatibility

4.3.a MANDATORY - the equipment shall be protected from radiated and conducted electrical and magnetic interference.

4.3.a VERIFICATION - the bidders shall state the means and the extent to which the equipment offered will be protected against electromagnetic transmissions from external sources. Standards used for EM protection shall be stated in an ‘annex’.

4.3.b MANDATORY - no part of the equipment shall generate sufficient radiated or conducted electromagnetic interference to affect the operation of any other part of the radar or other on-site equipment.

4.3.b VERIFICATION - the bidders shall state the measures taken to prevent the equipment offered from generating radiated or conducted electromagnetic interference to the radar itself and to external 220 volt power supply or other equipment which may be nearby. Relevant standards that the equipment meets shall be stated in an ‘annex’.

4.4 X-ray or radioactive emissions

4.4 MANDATORY - all equipment to which service personnel will normally have access during operation of the radar shall be adequately shielded to prevent harmful effects from any X-rays or other emissions emanating from the equipment.

4.5 VERIFICATION - possible sources of X-ray and radioactive emissions shall be stated in an ‘annex’. Emission levels and their compliance to international standards shall be stated in an ‘annex’.
5 Power Supplies

5.1 Mains Supply

5.1.a MANDATORY - the mains power supplies available are single-phase 220 VAC (+/- 10%) 50 Hz (+/- 5%), and three-phase 400 V (+/- 10%). A 5-conductor system is used. The signal ground shall be separated from the protective ground. The AC neutral and the protective ground shall be kept separated in the equipment.

5.1.b MANDATORY - all power supplies shall have adequate internal protection against supply transients.

5.1.b VERIFICATION - in an ‘annex’, bidders shall state the procedures and standards used for internal protection against power supply transients.

5.2 Power Consumption

5.2 MANDATORY - bidders shall state the total expected power consumption (kVA) of the completed installation at the radar site. The bidders shall specify the main equipment responsible for the power consumption and the maximum and average power consumption of these equipment.

5.3 Power Distribution

5.3 MANDATORY - the bidders shall describe the distribution of power supplies in the system and each sub-system. This shall include power distribution from the mains supply to the equipment racks and modules, including contactor switch and fuse locations. Redundancy or backup components and methods shall be stated.

5.4 System Start after Complete Power Failure

5.5.a MANDATORY - at the start of the system power-up all control signals shall be in predefined states.
5.5.b MANDATORY - sub-system must be able to be reset and restarted remotely and independently.

5.5.a&b VERIFICATION - in an ‘annex’, the bidders shall provide information of the following sub-systems:

1) transmitter  
2) receiver  
3) antenna/pedestal  
4) radar control processor  
5) radar signal processor and  
6) the whole system  

for

(a) Method(s) of resetting, e.g. mains off/on, processor only reset etc.  
(b) Any operator intervention required.  
(c) The time from power on to all aspects of the subsystem becoming operational.

5.5 Earthing

5.6 MANDATORY - all equipment shall be earthed.

5.6 VERIFICATION - in an ‘annex’ the bidders shall state the recommended maximum earth resistance that the equipment should be connected to.

6 Reliability

6.a MANDATORY - mechanical (moving) parts shall be designed to withstand at least 50000 hours of continuous use without failure or significant degradation of performance.

6.b MANDATORY - the radar and its ancillaries, considered as a whole system, shall be designed and constructed so that it shall not require scheduled maintenance more frequently than every 4400 hours.

6.b VERIFICATION - the bidders shall state the regular maintenance schedule in which interval and duration of minor and major maintenance actions are presented in an ‘annex’.
Section VI. Employer’s Requirements

6.c MANDATORY - the radar system shall attain an annual average availability of 99%. In calculating this figure, it is assumed that the necessary maintenance and repair staff are already on-site with the necessary spare parts when required. Also interruptions caused by faults in telecommunications or supply of electricity to the radar tower shall be excluded in this availability figure.

6.c VERIFICATION - the bidders shall provide the total annual availability and typical MTBF (mean time between failures) and MTTR (mean time to repair) figures, derived using the procedures contained in MIL-HDBK 217F (military handbook) or in equivalent standard, for the whole radar system. MTTR is taken from the time a technician arrives on site (with a replacement part or module and the appropriate tools) to the time the equipment is repaired. The calculation of the MTBF and MTTR figures shall also be given separately to the following sub-systems in ‘annexes’:

- Antenna pedestal including all mechanical moving parts.
- Transmitter including modulator and transmitter tube.
- Receiver including digital- and RF-part.

7 Maintenance

7.1 Test and Maintenance Equipment and Special Tools

7.1 MANDATORY - the bidders shall provide all test equipment with calibration certificates and special tools required for the proper maintenance, adjustment and operation of the radar. The test equipment shall include

1. Power meter
2. Frequency counter
3. Signal generator
4. Oscilloscope
5. Spectrum analyzer
6. RF detector
7. High voltage probe
8. Multimeter
9. Attenuator set
10. Connectors, adapters and cables

All equipment listed above will be in operational condition at the time of handover to the DHM.
### 7.2 Maintenance Support

7.2.a **MANDATORY** - maintenance support and spare parts shall be available from the bidders for a period of at least 12 years from the date of commissioning.

7.2.b **MANDATORY** - the bidders shall provide typical delivery times for, at least, the following spare parts:

- Azimuth and elevation rotary joints
- T/R limiters
- Dual-polarization switch (i.e. $H \leftrightarrow H + V$-switch)
- Azimuth and elevation servo drives
- Azimuth and elevation servo motors
- Slipring unit
- Transmitter tube
- LNA (low-noise amplifier)
- STALO (stable local oscillator)

7.2.c **MANDATORY** - details of the factory service available for repair of faulty parts or modules including typical costs and details of turn-around times of such repair shall be given.

### 7.3 Spare parts

7.3.a **MANDATORY** - the bidders shall supply a full list of spare parts for the intended life time of the system, complete with:

1) price
2) manufacturer
3) the model and identification number if available

7.3.b **MANDATORY** - the bidders shall supply a full list of consumable spares, complete with prices, expected to be needed for an initial period of 5 years.

7.3.c **MANDATORY** - the bidders shall give price per year for a service, in which the bidders maintains a spare parts reservoir (spare parts pool) from which DHM can buy spare parts on request. Also delivery times for these spare parts shall be given.
### 7.4 Calibration

<table>
<thead>
<tr>
<th>7.4.a MANDATORY</th>
<th>it shall be possible to fully calibrate the radar for radar reflectivity factor (dBZ), differential reflectivity (ZDR) and linear depolarization ratio (LDR) with a help of utility programs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.4.a VERIFICATION</td>
<td>the bidders shall describe the calibration procedures and user interfaces for these calibrations in an ‘annex’.</td>
</tr>
<tr>
<td>7.4.b MANDATORY</td>
<td>it shall be possible to calibrate the radar remotely for ZDR</td>
</tr>
<tr>
<td>7.4.b VERIFICATION</td>
<td>the methods used for the remote calibration shall be described in an ‘annex’.</td>
</tr>
</tbody>
</table>
SECTION 1B: RADAR TRANSMITTER SYSTEM REQUIREMENTS

1 Introduction

This section specifies the characteristics of the radar transmitter, antenna, radome and their immediate ancillaries, while section 1C specifies the requirements for the receiver, signal processor, data handling computer and software facilities at the radar site and at the radar centre.

1.1 Objectives

The radar transmitter and antenna system has the following tasks:

- to transmit pulses of RF power in the C-band of frequencies
- to provide necessary status signals for surveillance of the radar system’s functioning
- to enable controlled antenna movement
- to provide accurate antenna angle information
- to allow remote switching and control of all major radar system functions

2 General Requirements

2.1 Modularity and Expandability

2.1 MANDATORY - to ensure that the radar functions properly, the radar transmitter and associated equipment shall be designed to:

- be of modular construction to enable system expansions
- be capable of modular and easy replacement of faulty parts

2.1 VERIFICATION - the bidder shall describe the architecture and sub-modules of the transmitter and the antenna system at the block diagram level in an ‘annex’.

2.2 Monitoring

2.2.a MANDATORY - automatic safety actions, such as power switch-off, must be brought into play locally when undesired operating conditions or faulty operation of the system is detected.
Section VI. Employer’s Requirements

2.2.a VERIFICATION - the bidder shall state the automatic safety actions that the radar performs in case of fault in operation of the system or because of undesired operating conditions in an ‘annex’.

2.2.b MANDATORY - as many as possible performance parameters are to be monitored. At least the following typical parameters are required to be monitored:

- receiver AFC
- transmitter pulse repetition frequency
- transmitter pulse length
- transmitter operating voltages and currents
- servo motor status
- temperature at critical positions, at least in transmitter cabinet and receiver cabinets.
- oil levels and temperature of gearboxes if gearbox in oil
- interlocks
- transmitter cooling system
- modulator overload
- signal processor performance
- voltages of individual power supplies
- waveguide pressurisation status
- waveguide arching

2.2.b VERIFICATION - in an ‘annex’ the bidder shall state the parameters that are monitored on regular basis. Bidders are also asked to declare whether this information is used internally only by the system or is it also accessible by the user.

2.2.c MANDATORY - the radar shall include a user accessible interface for equipment status monitoring and reporting. It shall be possible to monitor the performance of selected functions on a non-interfering basis concurrent with the processing of online data and to perform sufficient tests to ascertain that no degradation in operation has occurred.

2.2.c VERIFICATION - in an ‘annex’ the bidder shall state the facilities that the proposed system will provide for user accessible status and performance monitoring and reporting.

2.3 Control

2.3.a MANDATORY - the radar shall be controllable and operable from any authorized remote computer terminal.
### 2.3.b MANDATORY

-at least the following shall be controllable from both the local radar computer terminal and from remote terminals:

- elevation and azimuth movement (pointing and turning modes)
- antenna speed
- mains on/off
- antenna servo powers on/off
- transmitter on/off
- pulse duration
- PRF
- reset of signal processor(s)
- reset of radar control processor(s)

### 2.3.b VERIFICATION

-in an ‘annex’ the bidder shall describe the systems which are used to control and to operate the radar system remotely and locally. User interfaces and architectures of these systems shall also be described.

### 3 Dual Polarization

<table>
<thead>
<tr>
<th>3.1 MANDATORY</th>
<th>The radar shall be dual polarization radar. Radar shall be able to transmit and receive pulses simultaneously in two orthogonal polarization planes, the planes being horizontal and vertical. Dual polarization radar shall also be capable of operating in the single polarization mode (horizontal polarization) in which all of the transmitter power is transmitted to the same channel and received at the same polarization and at the orthogonal polarization.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 VERIFICATION</td>
<td>the bidder shall state the design and solutions in detail in order to achieve above-mentioned operation modes in an ‘annex’.</td>
</tr>
</tbody>
</table>

### 4 Transmitter

<table>
<thead>
<tr>
<th>4.1 Transmitter Type and Operating Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.a MANDATORY</td>
</tr>
<tr>
<td>4.1.b MANDATORY</td>
</tr>
</tbody>
</table>
### Section VI. Employer’s Requirements

#### 4.1. c MANDATORY
- The modulator shall be solid state switched modulator. Thyratron type tube switched modulators are not accepted.

#### 4.1. a&b&c VERIFICATION
- The bidder shall state the characteristics of the transmitter in detail. The bidder shall describe the technology that is used in the modulator and explain the main principles of the modulator technology used at the block diagram level in an ‘annex’.

#### 4.2 Phase Stability

**4.2.a MANDATORY**
- The rms phase stability of the whole transceiver system shall be better than 0.5 degrees.

**4.2.a VERIFICATION**
- In an ‘annex’ the achievable phase stability in degrees and the means with which the bidder has confirmed this phase stability shall be presented. The bidder shall also present the conditions and settings under which the stated phase stability is achieved. Also the performance data of the main units determining phase stability has to be presented.

#### 4.3 Pulse Power

#### 4.4 Pulse Duration and Duty Cycle

**4.4.a MANDATORY**
- There shall be at least three user selectable pulse durations, 0.5 μs, 0.8μs and 2 μs, defined as 3 dB pulse durations.

**4.4.a VERIFICATION**
- In an ‘annex’ the bidder shall state the number of pulse duration and the pulse durations that are provided in the proposed system.

**4.4.b MANDATORY**
- Maximum duty cycle shall be at least 0.10% for all pulse durations.

**4.4.b VERIFICATION**
- The bidder shall state the maximum duty cycle limits for 0.5 μs, 0.8μs and 2 μs pulses in an ‘annex’.

**4.4.c MANDATORY**
- Droop of the pulse power at every pulse duration shall be less than ± 0.5 dB. Droop shall be measured in the area that covers 50 % of the 3 dB pulse duration and is centered at the middle of the pulse 3 dB points.
4.4.c VERIFICATION– in an ‘annex’ the bidder shall attach measured pulse shape plots for the pulse durations of 0.8 µs and 2.0 µs, from which the droop requirement can be confirmed.

4.5 PRF

4.5.a MANDATORY - PRF shall be freely selectable at least from 250 to 2000 within the minimum duty cycle limits.

4.5.b MANDATORY - the radar hardware shall include positive safeguards against the transmitter exceeding its duty cycle limits. These safeguards shall override any other radar system computer signals.

4.5.a&b VERIFICATION - in an ‘annex’ the bidder shall state the minimum and maximum PRF limits at every pulse duration and the functionality of the safety system used against exceeding duty cycle limits.

4.5.c MANDATORY - transmitter shall be capable of transmitting in dual PRF mode with the 3/2, 4/3 and 5/4 stagger ratios.

5 Waveguide components

5.1 Waveguides

5.1.a MANDATORY - the waveguides shall be fed with dried pressurized air throughout its whole length to the antenna feed horn for condensation prevention.

5.1.b MANDATORY - the transmission loss caused by the waveguides and other waveguide components shall be minimized.

5.1.b VERIFICATION - the one-way transmission loss caused by the waveguide per meter shall be given in an ‘annex’. Also the maximum losses of the following waveguide components in the transmitting/receiving chain shall be given in the operating frequency range of the proposed radar system in an ‘annex’.

1. Azimuth rotary joint
2. Elevation rotary joint
3. Circulators for TX and RX
4. Couplers
5. TX filters
6. dual-polarization switch

5.1.c MANDATORY - the estimated VSWR (Voltage Standing Wave Ratio) of the waveguide for a typical antenna installation shall be given.

5.2 Directional Couplers

5.2 MANDATORY - the radar shall be equipped with directional couplers which enable the calibration and maintenance measurements of the radar. Directional couplers shall enable the measurements both in TX and RX directions. Horizontal and vertical channels shall be both equipped with own directional couplers enabling separate maintenance measurements of the channels. Measured coupling values shall be delivered with the radar.

5.2 VERIFICATION - in an ‘annex’ placement of the directional couplers in the system and the directivity and coupling of the directional couplers shall be given (preferably measured) in the operating frequency range of the proposed radar system.

5.3 Filtering of the Transmitted Pulse

5.3.a MANDATORY – Regulations contained in CEPT/ERC/RECOMMENDATION 74-01E, ECC/REC/(02)05 and ITU-R SM.1541-2 or other frequency regulations in force in Nepal during the commissioning of the radar must be adopted for the proposed radar system.

5.3.b MANDATORY - the radar transmitter shall include the means to minimize the production of frequencies other than that of main radar signal, i.e. spurious harmonic and non-harmonic radiation. If specific transmitter filters are needed to meet the regulations set by the frequency spectrum authority in Nepal, the bidder shall provide these filters without extra cost.

5.3.a&b VERIFICATION - in an ‘annex’ the bidder shall provide performance figures for the methods employed to reduce the spurious transmissions to the levels accepted in Nepal. If transmitter filters are needed, the bidder shall state the one-way transmission loss and frequency response of the filters in the operating frequency range of the proposed radar system.

5.4 Dual-Polarization Switch

5.4.a MANDATORY - dual-polarization switch (i.e. H ↔ H + V -switch) shall be manufactured with a high precision allowing equal splitting of the transmitted signal and minimizing transmission loss caused by the switch.
5.4.b **MANDATORY** - dual-polarization switch (i.e. $H \leftrightarrow H + V$ - switch) shall be robustly designed permitting as many rotations as possible.

5.4.b **VERIFICATION** - in an ‘annex’ the bidder shall state the specifications for the number of rotations rated for the switch.

### 6 Antenna and Pedestal

#### 6.1 General

The antenna shall be of such a design as to minimize the major side lobes, particularly in a direction below the main beam. In view of the vicinity of the public to the radar station special attention should be given in the antenna design to minimizing stray radiation from e.g. direct overspill from the radiation feed horn.

DHM requires measured antenna radiation pattern results for the antenna at vertical and horizontal polarizations including E and H polarization planes and cross polarization levels.

6.1.a **MANDATORY** - the antenna shall be capable of transmitting and receiving simultaneously horizontally and vertically polarized orthogonal pulses.

6.1.b **MANDATORY** – the antenna system shall be capable of carrying out zenith scan calibration for ZDR (differential reflectivity) bias, i.e. it shall be possible to rotate the vertically pointing antenna full 360° in azimuth.


6.1.c **VERIFICATION** - in an ‘annex’ bidder shall state the stray radiation levels and the compliance with the regulations.

#### 6.2 Beam width and Co-Polar Matching

6.2.a **MANDATORY** - the -3 dB beam width shall not be greater than 1.0 degrees.

6.2.b **DESIRED** - The co-polar radiation patterns of the antenna for horizontally and vertically polarized pulses shall be as identical as possible and mention in bid if so provided.
6.2.a & b VERIFICATION - the bidder shall present in an ‘annex’ of the following:

1) Measured one-way power radiation patterns of the antenna in dBs (equal with the offered antenna) from which the beam width and the alignment of the main beams of the two polarizations can be verified. The radiation pattern shall be presented at horizontal polarization in E- and H-planes and at vertical polarization in E- and H-planes. The measurement frequency shall be 5625 MHz.

2) Maximum difference of the beam widths of the co-polar planes at the level of -3 dB and -10 dB compared to the maximum of the antenna’s radiation pattern shall be stated. These co-polar planes compared shall be

2.1) H-polarization E-field and V-polarization H-field and
2.2) H-polarization H-field V-polarization E-field.

The power radiation planes shall be normalized with respect to the maximum in that radiation plane.

6.3 Side Lobes

6.3.a MANDATORY - side lobes of the antenna shall be at least 28 dB lower than the main lobe maximum gain.

6.3.a VERIFICATION - the bidder shall state the peak side lobe levels at the horizontal and vertical polarizations in E- and H-planes. The bidder shall present measured one-way power radiation patterns (antenna equal with the offered antenna) from which the side lobe levels can be verified at horizontal polarization in E- and H-planes and at vertical polarization in E- and H-planes. The measurement frequency shall be 5625 MHz and shall be mentioned clearly in the ‘annex’.

6.4 Cross Polarization Isolation

6.4.a MANDATORY - the cross polarization isolation of the antenna inside the -3 dB beamwidth shall be at least 33 dB between the horizontal and vertical polarizations in E- and H-planes.

6.4.a VERIFICATION – In an ‘annex’, the bidder shall state the cross polarization levels at the horizontal and vertical polarizations in E- and H-planes. The bidder shall present measured one-way power radiation patterns of the antenna (equal with the offered antenna) from which the cross
polarization isolation can be verified. The cross polarization isolation shall be presented at horizontal polarization in E- and H-planes and at vertical polarization in E- and H-planes. The measurement frequency shall be 5625 MHz.

### 6.5 Elevation and Azimuth Angles

6.5.a **MANDATORY** - the antenna shall be capable of untrammeled movement in the whole 360 degrees of azimuth and -2 to +92 degrees in elevation.

6.5.b **MANDATORY** - the antenna shall be rotatable in azimuth and elevation at speeds which are continuously adjustable from 0 deg/second to at least 36 deg/second with an accuracy and variability of less than 0.2 deg/second over the whole range of climatic conditions given in Section 1A.

6.5.c **MANDATORY** - the antenna shall be able to move a 2 degree step in elevation in less than one second with an accuracy (peak to peak maximum variability of the reached elevation angle) of ± 0.1 degrees.

6.5.d **MANDATORY** - acceleration of the antenna system shall be at least 16 deg/sec² both in azimuth and in elevation directions.

6.5.a&b&c&d **VERIFICATION** - In an ‘annex’ the bidder shall state the performance limits and dynamic characteristics of the movement of the pedestal &antenna system.

6.5.e **MANDATORY** - the angular positioning of the antenna w.r.t. the rotational axes shall be indicated by a direct-reading accurate sensor on the antenna system itself.

6.5.e **VERIFICATION** - In an ‘annex’ the bidder shall present the angular positioning sensor system used and the performance limits, i.e. angular resolution and accuracy in azimuth and elevation directions, of the antenna movement sensor system.

6.5.f **MANDATORY** - the antenna pointing offset can be set and adjusted remotely.

6.5.f **VERIFICATION** - the bidder shall state the system and interface for remote antenna pointing offset adjustment in an ‘annex’.
Section VI. Employer’s Requirements

6.5.g MANDATORY - the accuracy for repeatability of the elevation and azimuth positioning shall be better than ±0.05 degrees (maximum peak-to-peak deviation of series of random positions from the set angle).

6.5.g VERIFICATION - In an ‘annex’ the bidder shall state the elevation and azimuth positioning accuracy for repeatability of the proposed antenna system and how this accuracy can be confirmed.

6.5.h MANDATORY - the antenna system is able to carry out an automatic Sun tracking

6.5.h VERIFICATION - In an ‘annex’ the bidder shall state the expected absolute positioning accuracy of the antenna system e.g. by using the Sun.

6.6 RHI Scans

6.6. MANDATORY - the radar transceiver shall be able to carry out vertical scans, e.g. RHI scans, on any azimuth bearing under local or remote control.

7 Radome

7.a MANDATORY - the radar antenna shall be housed in a radome. The radome shall be dust- and waterproof.

7.b MANDATORY - The radome shall have minimum dry attenuation, minimum beam distortion, polarization and sidelobe degradation properties. The radome shall be designed for dual-polarization use, i.e. the distortion between horizontal and vertical polarization planes caused by the radome has been minimized.

7.c MANDATORY - Additional attenuation due to rain shall be as low as possible and, in any case, shall not exceed one-way transmission loss of 1 dB at 50 mm/h at zero elevation at the operating frequency of the radar.

7.d MANDATORY - the effects of solar radiation and climatic conditions to the hydrophobic coating of the radome surface shall be minimized.
<table>
<thead>
<tr>
<th>7.a&amp;b&amp;c&amp;d VERIFICATION</th>
<th>the bidder shall state the aforementioned, preferably measured, properties of the radome. At least the following properties must be stated in an ‘annex’:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) maximum one-way transmission loss caused by dry radome</td>
<td></td>
</tr>
<tr>
<td>2) one-way transmission loss due to rain on the radome at 50 mm/h</td>
<td></td>
</tr>
<tr>
<td>3) maximum boresight error caused by the radome (azimuth and elevation)</td>
<td></td>
</tr>
<tr>
<td>4) expected ageing of the hydrophobic coating of the radome</td>
<td></td>
</tr>
</tbody>
</table>

| 7.e MANDATORY | the radome shall include attachment points for the lifting of the radome. The bidder shall state the accessories that are included in the radome delivery. |

| 7.f MANDATORY | the bidder shall provide information of the effect of the lightning protection to the radar performance and to the polarimetric quantities. |
SECTION VI. Employer’s Requirements

SECTION 1C: RADAR RECEIVER, SIGNAL PROCESSING AND DATA HANDLING

1 Introduction

This section covers requirements specific to the radar receiver front end, the digital receiver, the digital signal processor, computer control and surveillance of the radar specified in Section 1B, production of the data in digital form, and dispatch of the data over a computer network.

It is assumed that the digital receiver and signal processor will handle the incoming IF signal and produce I and Q signal components. Triggering of the transmitter is also assumed to be handled by the signal processor unit. The signal processor is assumed to be fully programmable regarding e.g. time-space resolution of the measurements, averaging, range-dependent corrections, clutter filtering and various modes of thresholding. The output from the signal processor, consisting of echo intensity, radial velocity, spectrum width data and the polarimetric quantities, is fed, tagged with the requisite elevation and azimuth angles and timing information, to the data-processing computer.

The data processing computer is assumed to maintain the antenna scan schedules and other necessary operational information, and to act as the master control for the radar station, as well as further processing the data received from the signal processor, and dispatching data over communications media to the DHM central radar data node. The major test and control functions for the radar are to be performable both locally and remotely.

The digital receiver and signal processor units will be installed in close proximity to the radar transmitter unit. The connection between the signal processor unit and the UNIX variant-based data processing computer is also close enough to employ reliable cable connection. The data-processing computer will handle data transmission to and from the radar station through a modem system.

The radar data is received in a DHM radar data centre, where the data is archived and various meteorological and hydrological products are calculated from the data received from the radar station. The radar data centre hosts a number of servers which handle these tasks. All these are part of the ITT. These products are distributed either automatically or on demand to various users such as forecasters, researchers, emergency management personnel, ATC or others. The user work stations are also included in the ITT.

2 General

2.1 Processing Modes

2.1 MANDATORY - a choice of processing method shall be provided. At least the following processing modes shall be provided:

- pulse pair
- frequency domain
2.1 VERIFICATION - In an ‘annex’ the bidder shall state the processing modes available for single- and dual polarization measurements.

2.2 Software

2.2.a MANDATORY - all systems shall be modular in nature. A high-level programming language should be used for the majority of the coding.

2.2.b MANDATORY - full documentation for all software modules associated with the system shall be provided.

2.2.a&b VERIFICATION - In an ‘annex’, the bidder shall state the software programming languages, standards and formats used in

- developing
- testing
- documenting the software

2.2.c MANDATORY - the bidder shall state the level of openness policy of the source code of the different software modules within the system and the extent to which the users are allowed to develop the source code. The bidder shall also describe the interfaces that are provided for user driven software development.

2.2.d MANDATORY – the bidder shall state the medium and formats used for transferring, storing and updating software (e.g. optical media, ftp service etc.).

2.2.e MANDATORY - the bidder shall ensure that, during the period of the project implementation and the warranty period following its final operational implementation, the application software shall always function with the latest published version of the radar site computer operating system, and whenever necessary, will issue without delay a new version of the application software to comply with this.

2.2.f MANDATORY - the bidder shall state his policy for future maintenance of software, both that offered and that to be developed.
Section VI. Employer’s Requirements

2.3 On-line Help

2.3 MANDATORY - a complete command line or graphical on-line help software facility is required.

3RF - Receiver

3.a MANDATORY - a receiver front-end shall receive the scattered power and provide from this an IF signal for feeding to the digital receiver.

3.b MANDATORY - the LNA and other RF components shall be of high quality in order to provide as high signal to noise ratio and as wide dynamic range as possible to the digital IF stage.

3.c MANDATORY - RF to IF down conversion shall be made with a two-stage IF down conversion enabling maximal filtering of the interference signals.

3.a&b&c VERIFICATION - In an ‘annex’, the bidder shall present the RF architecture of the analog part of the receiver at a block diagram level.

3.d MANDATORY - image frequency rejection ratio shall be at least 60 dB.

3d VERIFICATION - In an ‘annex’, the bidder shall state the image frequency rejection ratio in dBs at the operating frequency range of the radar.

4Digital receiver and signal processor

4.1 Objectives

The objectives of the digital receiver and signal processor are as follows:

- to digitize the raw IF signal, providing a linear response over a wide dynamic range of signal power
- to perform bandpass filtering according to the pulse length in use
### Section VI. Employer’s Requirements

- to extract I and Q signals
- to use the I and Q signals to produce averaged
  - calibrated echo power values
  - doppler radial velocity
  - spectrum width
- to use the I and Q signals to produce polarimetric quantities
  - differential reflectivity (ZDR)
  - differential phase (PhiDP) and specific differential phase (KDP)
  - copolar correlation coefficient (RhoHV)
  - linear depolarization ratio (LDR)
- to perform various thresholding functions, relating to
  - noise
  - clutter
  - coherency
- to affix time and angular tags to the data
- to apply ground-clutter filtering from a selection of filters
- to provide magnetron trigger signals
- to provide AFC to the radar if required

### 4.2 Minimum Noise Level

4.2. MANDATORY - the whole receiving chain shall be designed to be able to detect as low reflected signal levels as possible and at least -114 dBm.

4.2. VERIFICATION - In an ‘annex’, the bidder shall state the minimum noise level of the whole receiving chain (including the RF- and the digital part of the receiver) at the detector of the receiver in dBm. In deriving this figure, following settings and assumptions shall be used:

- 2 μs pulse duration
- matched FIR filter for 2 μs pulse
- 32 pulse samples
- thermal noise caused by antenna and waveguide can be neglected.

### 4.3 AFC (Automatic frequency control)

4.3.a MANDATORY - the system shall include AFC system which enables digital control of STALO.

4.3.b MANDATORY - it shall be possible to control the AFC from the radar control software so as to prevent the AFC from operating during a data collecting period.
### 4.4 Receiver Dynamic Range

4.4 MANDATORY - the whole receiver chain shall provide response over a dynamic range of at least 98 dB for the $2\mu s$ pulse duration. The dynamic range is defined as the region between the 1 dB point above noise level and the 1 dB compression point when measured at the input at the receiver.

4.4 VERIFICATION - In an ‘annex’, bidder shall state the dynamic range of the receiver for $2\mu s$ pulse. A matched band pass filter for $2\mu s$ pulse and 32 pulses is assumed. If there are the methods in use to maintain the linearity near the noise and compression level of the LNA, the bidder shall present these methods and the improvement achieved in linearity.

### 4.5 Signal and Range Digitization

4.5.a MANDATORY - the observation range of the radar shall be divisible into at least 4000 gates, which shall be possible to regroup into larger units for range-averaging purposes.

4.5.b MANDATORY - time/pulse averaging shall be user selectable at least in the range from 4 to 256 pulse samples. At least equal-weighted (boxcar) averaging shall be provided.

4.5.c MANDATORY - range bin averaging shall be user selectable at least in the range from 2 to 16.

4.5.d MANDATORY - The A/D conversion shall be carried out with at least 14 bits/channel.

4.5.d&e VERIFICATION - In an ‘annex’, the bidder shall state the characteristics of the analog-to-digital conversion implemented including, at least:
1) bits/channel used
2) the maximum sampling frequency
3) jitter associated with the sampling process
## 4.6 Corrections to Echo Parameters

### 4.6.a MANDATORY
- Storable files of corrected data in polar form shall be produced from the echo signal. The contents of the file metadata shall correctly record the processing parameters.

### 4.6.b MANDATORY
- It shall be possible to correct the received power at least for the following effects:
  - Gaseous attenuation due to oxygen
  - Attenuation due to intervening hydrometeors. Attenuation correction algorithms shall be based on dual polarization quantities.
  - Azimuth and elevation dependent attenuation due to partial beam blocking.
  - For second and multiple trip echoes

It shall be possible for the user to define, for each correction separately, whether the correction is on or off.

### 4.6.a & 4.6.b VERIFICATION
- The bidder shall present the data corrections available and the scientific basis of the used correction methods in an ‘annex’.

### 4.6.c MANDATORY
- It shall be possible to save both the corrected and the uncorrected reflectivity data separately.

### 4.6.d MANDATORY
- The calibrated echo intensity (radar reflectivity factor) in scaled dBZ units shall be obtained from the corrected echo signal using a user-definable radar constant, together with a calibration constants or tables derived directly from a calibration procedure. The range of scaled values shall extend at least from -31dBZ to +95dBZ in steps of not greater than 0.1 dB.

### 4.6.d VERIFICATION
- The bidder shall state the range of dBZ values available and the associated resolution in an ‘annex’.

### 4.6.e MANDATORY
- It shall be possible to remove the receiver noise from the data in such a way that the maximum possible sensitivity to weather echo signals shall be automatically maintained.

### 4.6.e VERIFICATION
- The bidder shall state the method used for noise removal in order to maintain maximum sensitivity in an ‘annex’.
4.7 Velocity Processing and SQI

4.7.a MANDATORY - radial velocity, spectrum width and SQI shall be extracted at each range bin.

4.7.b MANDATORY - dual-PRF velocity unfolding shall be provided at least at 3/2, 4/3 and 5/4 selectable ratios.

4.8 Dual polarization processing

4.8.a MANDATORY - hydrometeor classification (rain, dry snow, wet snow, graupel, hail and non-meteorological echoes) shall be extracted at each range bin where the dual-polarization parameters have been measured.

4.8.b MANDATORY - user shall have access, instructions and manuals to change the configuration of the hydrometeor classification algorithm.

4.8.c DESIRED - first guess settings, suitable for climate of Nepal and C-band radars, for hydrometeor classification shall be provided. Mention in bid if so provided.

4.8.a&b&c VERIFICATION - the bidder shall describe in ‘annex’ the following:
1) the hydrometeor classification scheme available in the system.
2) the user definable parameters in these algorithms.
3) the user interface for making these configurations.
4) how the settings suitable for Nepalese climate are verified.

4.8.d MANDATORY - dual-polarization attenuation correction algorithm shall be provided. It shall be possible for the user to switch it on and off.

4.8.e MANDATORY - user shall have access, instructions and manuals to change the configuration of the dual polarization attenuation correction algorithm.

4.8.f DESIRED - user shall have access to choose between different attenuation correction algorithms. Mention in bid if so provided.

4.8.d&e&f VERIFICATION – In an ‘annex’ the bidder shall state the attenuation correction
algorithms available in the system and the user definable parameters in these algorithms. User interface for making these configurations shall also be presented.

4.8.g MANDATORY - ZDR bias caused by differential attenuation (of the H and V polarized signals) in rain can be corrected.

4.8.g VERIFICATION - the bidder shall state in an ‘annex’ the method for ZDR bias correction associated with differential attenuation in rain.

4.8.h MANDATORY - a filtering algorithm shall be applied for smoothing raw PhiDP data e.g. for KDP based rain intensity estimation.

4.8.h VERIFICATION - the bidder shall state in an ‘annex’ the smoothing algorithm(s) available and the parameters that are user definable in these algorithms.

### 4.9 Time and Angle Marking

4.9 MANDATORY - each array of range gate values shall be provided with a time and angle tag, from which the actual (i.e. computer-maintained) time and elevation and azimuth angles of the individual observation can be obtained. These tags shall accompany the polar data.

### 4.10 Ground Clutter Removal

4.10.a MANDATORY - ground clutter removal shall be possible through the application of a selectable digital filters of varying widths and digital filters based on adaptive processing.

4.10.a VERIFICATION- In an ‘annex’ bidder shall provide information of the variety of clutter filters available and filter performance facts.

### 4.11 Data Thresholding

4.11.a MANDATORY - data thresholding shall be possible through the (separate and/or combined) application of thresholds fordBT, dBZ, V, W and dual polarization variables based, at least, on following criteria:
- signal to noise ratio
- signal to clutter ratio
- signal coherency

4.11.a VERIFICATION - the bidder shall describe the thresholding options of the proposed system in an ‘annex’.

4.11.b MANDATORY - speckle filter for single spike removal shall be provided.

4.11.b VERIFICATION - the bidder shall describe in an ‘annex’ different speckle filter options available in the proposed system and the principles of the algorithms used.

4.12 Interference Cancellation

MANDATORY – the radar software and the whole radar receiver chain shall include the means to minimize the reception of frequencies other than that of main radar signal originating from external sources.

VERIFICATION - In an ‘annex’ the bidder shall provide detailed performance figures and explanation of the methods and software employed to reduce the reception of interfering signals.
5 Data Processing and Radar Control

5.1 Objectives

- to further process radar reflectivity factor, Doppler and Polari metric information into formatted polar files
- to compress polar files for efficient communication to other computers, for disk storage and for archiving
- to provide automatic radar station close-down and power-up in power failure/restoration situations, and also other switching functions
- to apply internally consistent control signals to the radar to carry out the required scan (e.g. rotational speed, elevation angle selection) at the correct PRF and pulse length
- to maintain a schedule of scan sequences to allow e.g. flexible interleaving of various scan types
- to maintain an updated list of the values of all user-definable parameters, including tasks
- to provide off-line and on-line diagnostic tests for the correct functioning of the radar
- to collect radar station security and environment data (e.g. power supply, locks, temperature) for warning purposes
- to automatically transmit onward (to e.g. a monitoring node) warning of radar station malfunctioning or security breaks
- to allow complete remote on- and off-line operation, including the resetting of all processors of the radar station through a standard X-interface
- to provide an on-line "help" facility for maintenance staff

5.2 Radar Data

5.2.a MANDATORY - corrected data from a single rotation of the antenna at a constant elevation angle must be available for use immediately upon completion of the scan at that elevation angle. This is required for the basic quantities i.e. reflectivity factor, radial velocity, spectrum width and polarimetric quantities. Radar data shall consist of an assemblage of data from such single-elevation scans.

5.2.b MANDATORY - RHI (nodding antenna) scan data shall also be recordable on file, in a similar manner to that from polar data.

5.3 Data Format Resolution

5.3.a MANDATORY - all radar data shall be possible to store in 8-bit and 16-bit binary format. Selection shall be user definable.
5.3.a VERIFICATION – In an ‘annex’ the bidder shall state the resolution for 8 and 16 bit data for dBZ, V, W, ZDR, rhoHV, LDR, phiDP, and KDP.

5.3.b MANDATORY - radar data shall be saved in polar coordinate system.

5.3.c MANDATORY - the polar data shall be subjected to user defined height-thresholding (i.e. all echoes above a specifiable maximum height shall be removed) and compression for disk storage and onward transmission.

5.4 Data File Formats

5.4.a MANDATORY - all radar data files shall contain metadata supplying all information relating to the time and place of data collection and other parameters relevant to archiving and re-processing.

5.4.a VERIFICATION - the bidder shall state in an ‘annex’ the structure of the metadata included in data files as well as the contents of the metadata.

5.4.b DESIRED - the files to be transmitted to the central computer node should conform to the ODIM (Opera Data Information Model) HDF5 conventions in addition to the manufacturer’s own native data format. Mention in bid if so provided.

5.4.b VERIFICATION - the bidder shall state in an ‘annex’ the data formats their systems supports for data files.

5.5 Radar Control

5.5.1 General

5.5.1.a MANDATORY - The software shall permit the control of all major radar station functions and parameters, both switching and adjustment. The following is a minimum list of such mandatory functions.

- main power to radar on/off
- power to antenna on/off
- antenna positioning and rotation
- EM radiation on/off
- radar pulse length
- PRF
- reset of signal processor and other radar internal processors.
5.5.1.b MANDATORY - all combinations of radar parameters selected for use shall be checked for consistency and reasonability. No operation of the radar outside its safe limits shall be possible. Selection of forbidden combinations shall result in warning or information messages to direct the operator to corrective action.

5.5.1.c MANDATORY - the design of software and hardware shall be "fail safe" in any partial or total power failure situation.

5.5.1.d MANDATORY - the hardware combination (radar/signal processor/radar computer) must be capable of automatic recovery from a power failure. The power-up state of all signals to the radar must be well-defined, and must not permit any uncontrolled operation of the radar. Power failure shall always result in a "fail-safe" shutdown.

5.5.1.e MANDATORY - after a power supply failure and restoration, the radar system shall automatically be restored to a ready state to resume normal operation.

5.5.1.e VERIFICATION - the bidder shall state in an 'annex' as to how the operation of the radar within its safe limits and "fail safe" operation after power failure is guaranteed.

5.5.1.f MANDATORY - the signal processor shall set the pulse length and PRF of the transmitter under program control from the radar data processing computer. The values of pulse length and PRF set may never be allowed to exceed the operating limits of the transmitter.

5.5.2  Antenna Control and Scanning Programs

5.5.2.a MANDATORY - the following antenna positioning parameters shall be controllable through the application program both in scanning and in manual antenna mode:

- antenna elevation
- antenna azimuth
- antenna rotation speed
- antenna motion in the vertical plane (RHI)

The absolute positioning accuracy shall be the same as that attained in movement of the antenna under manual control, and the whole range of rotation speeds mechanically permitted shall also be available through the program.

5.5.2.b MANDATORY - the application software shall permit different scan modes, during which data (Doppler, reflectivity and dual polarization variables) shall be collected, as follows:

- pointing mode, at constant elevation and azimuth
- rotation mode, consisting of a single (360 degree) rotation at a constant, user-defined elevation
angle at a speed determined
  o by the selected angular width of the sampling sector and the number of pulses selected for averaging or
  o by the given antenna velocity
- 3D-rotation mode, consisting of a series of consecutive operations in rotation mode, the set of elevation angles and rotation speeds being user-defined. There shall be at least 30 elevation angles that can be used. Both decreasing and increasing angles are to be permitted.
- sector mode, in which the antenna moves to and from between two given azimuths at a given rotation speed
- RHI-scan mode, in which the antenna nods between two given elevation angles at given azimuth angle.

<table>
<thead>
<tr>
<th>5.5.2.b VERIFICATION</th>
<th>bidder shall state in an ‘annex’ the scan modes permitted.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5.2.c MANDATORY</td>
<td>the application software shall permit automatic Sun-tracking mode, in which the antenna follows automatically the calculated position and movement of the Sun.</td>
</tr>
<tr>
<td>5.5.2.c VERIFICATION</td>
<td>In an ‘annex’; the bidder shall present the Sun-tracking applications it can provide. The bidder shall also present the user interfaces available for monitoring, controlling and analyses of the Sun measurements.</td>
</tr>
<tr>
<td>5.5.2.d MANDATORY</td>
<td>any scan mode may be selected to repeat at a given interval, starting from a given time.</td>
</tr>
<tr>
<td>5.5.2.e MANDATORY</td>
<td>a schedule may be constructed of any series of different scan modes, which then repeat according to the schedule.</td>
</tr>
<tr>
<td>5.5.2.f MANDATORY</td>
<td>there shall be a user interface for setting and configuring the scan parameters and processing options. It shall be possible to configure the task settings individually for every elevation angle.</td>
</tr>
<tr>
<td>5.5.2.f VERIFICATION</td>
<td>In an ‘annex’, the bidder shall present the interface provided for task setting and configuration.</td>
</tr>
<tr>
<td>5.5.2.g MANDATORY</td>
<td>scan scheduling program shall fulfil the schedule according to a given scan priority allocation. Scan priority allocation shall be user definable.</td>
</tr>
<tr>
<td>5.5.2h MANDATORY</td>
<td>the scan schedule control program shall automatically check whether the radar was able to fulfil the given schedule immediately after the task was run, and issue a warning if given timelines were not met.</td>
</tr>
</tbody>
</table>
Section VI. Employer’s Requirements

5.5.2g&h VERIFICATION – In an ‘annex’, the bidder shall state the automatic checking procedures for the radar’s ability to fulfill given scans. The bidder shall also state how the warnings in conflicting cases are arranged.

5.5.2i MANDATORY – there shall be a method to turn EM radiation off between two given azimuths during any scan mode.

5.6 Radar Status Monitoring

5.6.a MANDATORY - system performance and malfunctions shall be recorded continuously in logging files, which shall be easily accessible for off-line and on-line analysis.

5.6.a VERIFICATION – In an ‘annex’; bidder shall state the files that are used for performance and malfunction logging and what information is logged into these files. The bidder shall also state how operator can access these data.

5.6.b MANDATORY - the system shall be able to self diagnose the status of the whole radar system and to give automatic warnings, both locally and remotely, to the operator if malfunction or system performance degradation is suspected.

5.6.c MANDATORY - a user interface for status and warning messages shall be provided. Radar status messages shall be given on at least two levels (e.g. "information" and "warning"). Status messages shall be stored in a convenient form as a log for fault diagnosis.

5.6.b&c VERIFICATION - In an ‘annex’; bidder shall state how self diagnosing of the whole radar system is arranged and how the automatic warnings to the operator are given. Bidders are also asked to present the user interface provided for handling the error and system performance messages.

5.6.d DESIRED - all variable parameters which give rise to status messages shall be provided with at least upper and lower warning limits and these limits shall be settable by the user. Mention in bid if so provided.

5.6.d VERIFICATION - bidder shall state how the user can set the warning limits and what kind of a user interface is provided for these purposes in an ‘annex’.
5.6.1 Scheduling Information

<table>
<thead>
<tr>
<th>5.6.1 MANDATORY</th>
<th>operation schedules shall be continuously monitored and their values/status shall be available for scrutiny by an operator.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6.1 VERIFICATION</td>
<td>In an ‘annex’, the bidder shall give a description of scheduling reporting and of the interface provided for measurement scheduling monitoring.</td>
</tr>
</tbody>
</table>

5.6.2 Diagnostic Tests

<table>
<thead>
<tr>
<th>5.6.2 MANDATORY</th>
<th>the system shall be capable of carrying out both off-line and on-line automatic diagnostic tests for correct functioning of the radar, digital receiver and signal processor and its sub-units, e.g. at the start-up of the radar. It shall be possible to send automatic warnings from these tests to the central computer node.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6.2 VERIFICATION</td>
<td>the bidder shall give a description of the automatic diagnostic tests available for the radar in an ‘annex’.</td>
</tr>
</tbody>
</table>

5.7 Utility Programs

<table>
<thead>
<tr>
<th>5.7.a MANDATORY</th>
<th>utility software(s) shall be provided at least for the following functions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>setting up of the digital receiver and its associated functions</td>
</tr>
<tr>
<td>2)</td>
<td>setting up the signal processor</td>
</tr>
<tr>
<td>3)</td>
<td>carrying out the receiver calibration for reflectivity</td>
</tr>
<tr>
<td>4)</td>
<td>carrying out ZDR (bird bath) and LDR offset detection and setting</td>
</tr>
<tr>
<td>5)</td>
<td>setting up the transmitter trigger timing</td>
</tr>
<tr>
<td>6)</td>
<td>investigation of Doppler spectra</td>
</tr>
<tr>
<td>7)</td>
<td>control of the antenna for manual pointing</td>
</tr>
<tr>
<td>8)</td>
<td>reading out the current configuration of the signal processor</td>
</tr>
<tr>
<td>9)</td>
<td>examination of raw data files including metadata. The results of such investigations and parameter-setting shall be recordable on file.</td>
</tr>
<tr>
<td>10)</td>
<td>Sun tracking for determining correct pointing of the antenna.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.7.b MANDATORY</th>
<th>utility software shall be provided at least for one of the following functions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>investigation of reflectivity, Doppler and dual polarization data as a function of range and time (Range-Time display)</td>
</tr>
<tr>
<td>2)</td>
<td>investigation of reflectivity, Doppler and dual polarization data as a function of range and azimuth angle (B-Scope display)</td>
</tr>
</tbody>
</table>
5.7.b VERIFICATION - the bidder shall state in an ‘annex’ whether the systems supports Range-Time and B-Scope displays.

5.8 Remote Operation

5.8 MANDATORY - full normal operation and control of the radar and its data processing units, including off- and on-line testing and utility programs, shall be possible through a remote X-window connection compatible.

5.8 VERIFICATION - bidder shall state the interface and technology used for the remote operation of the radar in an ‘annex’.

5.9 Hardware and Software Compatibility

5.9 MANDATORY - the radar computer software shall run under Linux operating system.

5.9 VERIFICATION - In an ‘annex’; a list of LINUX/UNIX variant -based platforms on which the bidder’s software is a) already operationally running and b) is additionally certified to run.

5.10 Telecommunications

The radar will be operating in the DHM weather radar network. The radar computer is connected to the router via Ethernet.

5.10.a MANDATORY - the radar data handling computer shall communicate with the central computer node via the router using TCP/IP protocols.

5.10.b MANDATORY - the proposed communications hardware/software must interface with modems permitted by the Nepalese telecommunication authority.

5.10.c MANDATORY - the communications ports/drivers in the hardware/software proposed must allow the use of telecommunication connections at the speed of at least of 2 Mbps.

5.10.a&b&c VERIFICATION - In an ‘annex’; the bidder shall present the hardware/software interface to the telecommunication service provider, and the data rates the proposed communications hardware/software is capable to provide. Bidder shall also state the data rates required by all measurable variables to be transmitted.
5.10.d MANDATORY – the bidder shall provide a communication connection for transmitting the raw data to the radar data centre and for remote control and monitoring of the radar. The bidder shall state the minimum required communication speed needed, assuming the following processing parameters

- Measurement range 250 km, with bin size of 500 m
- Azimuth bin size 1 degree
- Volume time 10 minutes
- 12 elevations angles up to 45 deg
- Raw data transferred, 8 moments
- 8 bit data
- Altitude cut off at 16 km
- Transmission overhead: system dependent
- Compression ratio: severe rainfall case

5.11 **Local Display of Radar Products**

The technicians will use the display of the radar computer for displaying a limited number of products in support of servicing and fault-finding at the radar station.

5.11.a MANDATORY - it shall be possible to run all necessary on- and off-line tests for the radar and its associated software and display and save the results, using the technicians' terminal.

5.11.b MANDATORY - the available products for viewing on the local display shall include at least PPI and RHI display of all measured parameters including dual polarization parameters.

### 6 Radar product generation

#### 6.1 General

6.1.a The objectives:
- To calculate meteorological and hydrological products
- To provide visualization of the products for the users
- To archive radar data received from the radar site, and radar products
6.1.b MANDATORY: The products generation shall run automatically without user intervention under a scheduler. It shall also be possible to generate products manually using a command line interface and a graphical interface.

6.2 Base meteorological products

6.2.a MANDATORY – at least the following products shall be generated for the quantities indicated (Z, V, W, ZDR, rhoHV, LDR, phiDP, and KDP) or height of measure H
   I. Plan Position Indicator (PPI) – for all quantities
   II. Range Height Indicator (RHI) – for all quantities
   III. Constant Altitude Plan Position Indicator (CAPPI)) – Z
   IV. Pseudo CAPPI (PCAPPI) – Z
   V. Maximum display (MAX) – Z, KDP
   VI. Echo Top Height (TOPS) – H (with selectable Z threshold)
   VII. Echo Base height (BASE) – H (with selectable Z threshold)
   VIII. Height of maximum intensity (HMAX) - H
   IX. Vertical Wind profile (VVP, Volume Velocity Processing) – V

6.2.a VERIFICATION – In an ‘annex’, the bidder/tenderer shall state which products are generated, and state the algorithms used and the storage range and resolution of the products.

6.3 Rainfall products and hydrological products

6.3.a MANDATORY – at least the following products shall be generated
   I. Surface Rainfall Intensity (SRI) – R (mm/h). The Z-R relation shall be configurable by the user. There shall be a relationship based on polarimetric quantities (ZDR, KDP), with constants configurable by the user.
   II. Surface Precipitation Accumulation (mm) for time period defined by the user (1,2,3,…,144 hours)
   III. Sub catchment Accumulation (mm) – for time period defined by the user (1,2,3,…,144 hours) for any number of basins.
   IV. Vertically Integrated Liquid (VIL) – (mm)
   V. Vertically Integrated Liquid density – (gm⁻³)

6.3a VERIFICATION – In an ‘annex’, the tender shall state which products are generated, and state the algorithms used and the storage range and resolution of the products.
6.3b MANDATORY – there shall be a Vertical Reflectivity Profile (VPR) correction suitable for Nepalese climate, which takes into account the bright band, topography, and rain type (convective, stratiform)

6.3b VERIFICATION – In an ‘annex’, the bidder shall state the algorithm used for VPR

6.3c MANDATORY – there shall be a hydrometeor classification product, based on reflectivity and polarimetric quantities. The parameters shall be changeable by the user. The need for external data for classification, such as temperature, shall be indicated.

6.3c VERIFICATION – In an ‘annex’, the bidder shall state the algorithms used in the hydrometeor classification scheme.

6.3d MANDATORY – the system shall be able to make precipitation adjustment using real-time precipitation data from rain gauge or disdrometer.

6.3d VERIFICATION – In an ‘annex’, the bidder shall explain how the adjustment is done and provide references for the method

6.3e MANDATORY – it shall be configurable by the user whether the precipitation adjustment is done or not

6.3f MANDATORY – it shall be possible to extract the value of any product at a given location using the graphical interface and by using a command line tool.

6.4 Wind products

6.4.a MANDATORY – the following wind products shall be generated

I. Radial shear – ms⁻¹/km
II. Azimuthal shear – ms⁻¹/km
III. Elevation shear - ms⁻¹/km
IV. Radial-elevation shear - ms⁻¹/km
V. Radial-azimuthal shear - ms⁻¹/km
VI. Radial-azimuthal-elevation shear - ms⁻¹/km
VII. Horizontal shear - ms⁻¹/km
VI. Vertical shear - ms$^{-1}$/km  
IX. Shear line  
X. Three dimensional shear - ms$^{-1}$/km

6.4a VERIFICATION – the tender shall state in an ‘annex’, which products are generated, and state the algorithms used and the storage range and resolution of the products.

6.5 Composite products

6.5.a MANDATORY – the system shall be able to generate the composite products automatically from the products generated by the radar network

6.6 Data archiving and retrieval

6.6.a MANDATORY – all radar data and products shall be archived automatically. Archiving strategy shall continue automatically in accordance with the program selectable by the user. Archiving tools shall be high density tapes, large capacity optical discs and/or large capacity discs.

6.6.b MANDATORY – archiving and retrieval shall be conducted by both a visual user interface and command line

6.7 Data visualization

6.7.a MANDATORY – the system shall be able to display all radar products and composites in several map projections including e.g. projections such as polar stereographic, Mercator, UTM (Universal Transverse Mercator), azimuthal equidistance, perspective, equidistance cylinder, gnomonic, Gauss conformal, Lambert conic and plate carrée.

6.7a VERIFICATION – In an ‘annex’, the bidder shall state the projections supported

6.7b MANDATORY – the system shall be able to display the individual radar products and composites on a geographical map of Nepal and on any other map provided by the user in a suitable format.
### 6.7b VERIFICATION
In an ‘annex’, the bidder shall state the map formats supported

### 6.7c MANDATORY
The system shall be able to show the satellite images and surface observations as image layers (underlay, overlay) with the composite radar images

### 6.7d MANDATORY
The system shall be able to display lightning location products

### 6.7e MANDATORY
The system shall be able to display the product of at least up to 48 hours by making animation. Animation time, speed and looping shall be user definable.

### 6.7f
The system shall be able to export all products to another computer in the DHM network in common pictorial formats (png, jpeg etc)

### 6.8 Computers

#### 6.8a MANDATORY
The bidder shall supply the following computers, with all the necessary software installed and with licenses
- A computer for radar control at the radar site
- A computer at the DHM radar centre for remote control of the radar
- A computer for the product generation and data archiving with disk capacity sufficient for storing 5 years of data, equipped with a data backup system. (see 6.8b)
- A live backup system of the above which can be taken into use at short notice. (see 6.8b)
- Three desktop computers and one laptop computer for meteorological workstations able to display radar products. The workstations shall have the following minimum properties:
  1. Processor: Intel i5 or better
  2. Hard disk: 1 TB (desk top), 500 GB SSD (laptop)
  3. Memory: 16 GB
  4. Monitor: 27 inch or larger

All the computers shall be of latest version in software and hardware available at the time delivery.

#### 6.8b DESIRED
The product generation should preferably run in the virtual environment used by DHM. The computer for the product generation and its backup system need not be supplied in such case. Mention in bid if so provided.
SECTION 1D: DOCUMENTATION, TRAINING, INSTALLATION, ENVIRONMENTAL, and BUILDING SERVICES

1 Introduction

Site preparation work will be part of the ITT. DHM will be responsible for providing electricity to the building site.

2 Documentation

2.1.a MANDATORY - the bidder will be required to supply three printed sets and one set in electrical format (PDF files or equivalent format) of radar manuals. Manuals shall contain at least following information:

1) full information on construction, maintenance and operation of the radar for each installation, covering all parts of the system, whether of his own manufacture or that of a subcontractor
2) all necessary circuit diagrams giving voltages and waveforms where considered appropriate
3) full details of calibration and checks for acceptable limits
4) drawings of all mechanical parts, e.g. the antenna rotation mechanisms shall be provided at a level allowing assembly, disassembly, maintenance and replacement.
5) installation guide.

2.1.b MANDATORY - Software documentation manuals (three sets) shall include at a minimum:

1) a user’s guide to on-line and utility programs,
2) a software installation guide
3) a programmer’s interface and format guide,
4) a guide to signal processing and algorithms used
5) a detailed guide for configuring all available variables in the system, including dual polarization variables.

2.1.c MANDATORY - One set of the factory acceptance test specifications with measured values shall be supplied. FAT specification shall include measured antenna radiation pattern results for the antenna including at least E (electric) and H (magnetic) planes and cross polarization levels at vertical and horizontal polarizations.
2.1.d MANDATORY - The documentation and manuals shall be written in English. DHM is allowed to take copies of the manuals as specified in 2.1a-d for DHM’s internal use.

2.1.e MANDATORY - The bidder shall state if there are certain units for which (e.g. proprietary secrecy reasons, third party origin) documentation will not be available, and shall propose an alternative solution to this problem.

3 Training

3.1 General

3.1.a MANDATORY - the following courses, to be held in English, shall be offered:

- a technical maintenance course to be held in supplier’s premises, connected with FAT. The course is arranged for 5 persons for 10-20 working days.
- a technical maintenance course to be held at the radar location after installation and SAT. The course is arranged for 5 persons for 5 working days.
- a software course to be held in Kathmandu for 5 persons for 5-10 working days

The bidder shall cover all cost of travel, accommodation and provide per diems for the maintenance course arranged at the supplier premises

3.1.b MANDATORY - the bidder shall give a description of the courses: agenda and short description of the content of courses.

3.2 Content and time for the Technical Maintenance Course

Trainee level: technicians and engineers with routine experience in electronics servicing.

3.2.a MANDATORY: - time and date of the technical maintenance course as specified in 3.1a
3.2.b MANDATORY: the courses shall give the trainees requisite knowledge of the functioning of the weather radar in association with its controlling programs, so that they will, on completion of the course, be able to calibrate, operate and maintain the weather radar hardware using the appropriate utility software and test instrumentation. Special emphasis is placed on the need for theoretical and practical training to proceed hand-in-hand.

### 3.3 Content and time for the Software Course

Trainee level: programmers and experienced computer operators.

3.3.a MANDATORY – time and date of the software course as specified in 3.1a.

3.3.b MANDATORY: Objectives: the course shall give the trainees a detailed knowledge of the function and interaction of the software modules comprising the radar station programs. On completion of the course, the trainees shall be fully conversant with the software interface to the radar system, the radar measurements, signal processing, and data transmission to allow them to monitor the system performance and diagnose and correct typical faulty operating conditions, as well as carry out upgrades with new program versions.

### 3.4 Training Material and Documentation

3.4.a MANDATORY - the bidder shall supply course material well in advance of the actual courses for trainee preparation. The course material will remain with the trainees for later reference. The course shall include the use of the actual handbooks which make up the official documentation of the radar system.

3.4.b MANDATORY - the bidder shall provide a complete training set in an electronic form, e.g. for later computer-aided training at DHM.

3.4c MANDATORY - The classroom training shall also be provided as a media file. DHM shall have permission to make copies of the files on an unlimited basis.
4Building and installation services

This section defines the civil works, building and installation services. Also the environmental systems, such as power station, are defined here.

4.1 Environmental systems

4.1.a MANDATORY - The bidder is responsible for supplying the back-up power, the uninterruptible power supply, automatic voltage regulators, air conditioning, fire alarm and extinguishing system, lightning protection and grounding systems. All plans of environmental equipment shall be submitted to DHM before the installation for acceptance and the bidder shall do modifications if needed. The bidder shall provide full documentation including drawings on all environmental systems.

4.1.b MANDATORY – The bidder shall take into account the high frequency of the power cuts in Nepal and the possible oscillation of the voltage, and design the system so that the availability of data is kept high.

4.1.b VERIFICATION – The bidder shall describe in an ‘annex’ how the system has been designed to withstand power cuts and voltage oscillation.

4.1c MANDATORY – Status information on all environmental systems shall be available via the BITE system of the radar.

4.2 Uninterruptible Power Supply (UPS)

4.2.a MANDATORY - the UPS system shall be able to keep the radar operating normally at least 30 minutes after power supply failure. A normal operation is considered as: PPI -mode, PRF = 500 Hz, 2 us pulse duration, antenna speed 16 deg/s, 36 elevation angles/15 minutes.
4.2.b MANDATORY - the UPS system has to be able to provide power supply to the radar at all possible current peak situations caused by the radar while being disconnected from the mains power supply.

4.2 a&b VERIFICATION – In an ‘annex’: provide information defining the UPS system for proposed radar system shall be given, including at least:

- the maximum switch-on current spikes
- peak power consumption
- average power consumption
- estimated time to keep radar operating after power supply failure in operation mode described in 4.2.a.

### 4.3 Back-up power

4.3a MANDATORY – As a mains back-up system the bidder shall supply two generators each capable of running the radar and other equipment in the radar tower continuously during power cuts. The generator system shall be able to step in automatically. The system shall be mounted so as to prevent vibration effects. The generator shall be housed in a building or a container, with ventilation and sound isolation.

4.3b MANDATORY – The bidder shall supply an underground fuel tank of 5000 litre capacity. The environmental safety regulations in force in Nepal shall be taken into account.

4.3c MANDATORY – The back-up generators shall start automatically in case of missing mains power, or mains voltage getting too low for radar operation. The generator shall step in within 10 seconds. In case the start is not successful, a restart is tried twice after 10 seconds. In case of failure, a warning is issued.

4.3d MANDATORY – The generator shall stop automatically on return of the mains or mains voltage retuning suitable for radar operations, and shall stop automatically after a cooling period.
4.3e **MANDATORY** – The generator shall be turned off in case of the occurrence of starting failure, high motor temperature, low oil pressure, or overdrive, and an alarm indicator lit on the control panel.

4.3f **MANDATORY** – The following indicators/functions shall be in the control panel

1. Generator output voltage and frequency
2. Output currents for all phases
3. Total working hours
4. Motor oil pressure
5. Motor cooling water temperature
6. Emergency stop button

4.3g **MANDATORY** – The following indicators shall be available remotely e.g. via the radar BITE system

1. The status of the generator (on/off)
2. Working time since startup
3. Occurrence of a failure as defined in 4.3c and 4.3e,

4.3h **MANDATORY** - The bidder shall supply spares and consumables for the generator system sufficient for five years of operation

4.3i **VERIFICATION** – The bidder shall present in an ‘annex’ a list of spares and consumables for the generator system

### 4.4 Radar Tower and other buildings

4.4a **MANDATORY** - All facilities shall be designed according to the soil structure and environmental conditions, including the risk for earthquakes. All material and equipment shall be compliant to the Nepal National Building Code.

4.4b **MANDATORY** – The bidder shall be responsible for civil works, such as excavation, filling, leveling, compression, and removal of the excess soil etc. according to Nepalese regulations.
4.4c MANDATORY – The contractor shall prepare a location plan for all constructions (radar tower, diesel power station), and provide drawings which are necessary to obtain the construction permission.

4.4d MANDATORY – Obtaining all permissions and certificates required for implementing the works shall be under responsibility of the DHM.

4.4e MANDATORY – The contractor shall provide a detailed geotechnical report on the soil type and stability of the radar site. It shall be used for installation of Radar tower and its foundation.

4.4f MANDATORY – The contractor shall provide an electrical, mechanical and structural analysis and detailed drawings of the radar tower and its foundations. DHM shall apply for the ‘Tower’ installation permission, if so required, after the analysis has been submitted and approved by DHM.

4.4g MANDATORY – The tower shall be constructed using hot-dip heavy quality galvanized steel material, able to withstand the environmental conditions stated, including earth quakes in compliance with the Nepalese seismic code requirements or up to Magnitude 9. The tower height shall be chosen so that the antenna feed is at minimum height of 30 m above the ground level.

4.4h MANDATORY – The maximum tower deflection for wind speed of 50 m/s shall be 0.16°.

4.4i MANDATORY - A 220 VAC power outlet shall be provided in the covered areas at the bottom and upper parts of the tower and inside the radome, as well.

4.4j MANDATORY - A safety sensor shall be provided at the radome entrance. When opened, antenna and radiation shall be stopped automatically, and a warning issued.

4.4k MANDATORY – There shall be sufficient LED-based lighting at all parts of the radar tower. Laws governing Civil aviation requirement shall be complied with.
4.4l MANDATORY – The radar control room shall be immediately below the radome in order to minimize the losses in the waveguides. The bidder shall provide a plan how the following items are installed in the control room: transmitter, receiver, communication equipment, dehydrator, measuring and maintenance devices, spares, computer and table, uninterruptible power supplies, and air conditioning system, and tables and chairs for 4 people working simultaneously at the control room all complete.

4.4m MANDATORY – The bidder shall provide a building or a standard container for the back-up power station defined in section 4.3.

4.4n MANDATORY – The contractor shall provide detailed drawings of all works. These drawings shall be in sufficient detail for use later in maintenance and defect detection.

**4.5 Installation services**

4.5.a MANDATORY - the bidder shall be responsible for all installation services and provide a fully working system (turn-key)

**4.6 Maintenance services**

4.6a MANDATORY - The contractor shall be responsible for preventive and corrective maintenance during the warranty period. The contractor is also responsible for providing all spare parts during the warranty period. The maintenance shall be arranged in co-operation with DHM, and DHM personnel may be present during it. Corrective maintenance shall be started without any unnecessary delay, and in all cases within 5 calendar days after DHM has informed of the failure.

The Contractor shall be authorized to access to the system for remote control and maintenance during warranty period.

4.6a VERIFICATION – In an ‘annex’; The bidder shall provide a plan for the preventive maintenance and describe how preventive and corrective maintenance are arranged, and state the response time.

4.6 b On hand over of the complete system to DHM at the end of the maintenance period, the bidder shall supply a manual specifying all faults experienced by the system together with an account of how such faults have been rectified. The objective is DHM will learn from the lessons acquired during the maintenance period. The bidder shall keep a complete maintenance log of all facilities provided under contract, including sensors and data logger. This maintenance log will be available
online and will allow queries of problems/observations at given sites, as well as queries on the status of every piece of equipment that has a serial number.

4.6 c Further, in connection with the remedying of defects the maximum downtime (defined as number of days for which the system is not usable because of inability of the bidder/tenderer to repair it) of radar system for any cause is taken as 15 days. In case the system is not usable beyond the stipulated maximum downtime a deduction of 300 USD per day for duration of period exceeding maximum downtime shall be recovered from bidder’s due amount.”

4.6 d The bidder shall offer a 24/7 help desk function, which can be contacted by phone and/or electronic means.

4.6 e After the warranty period the bidder shall offer maintenance support as requested by DHM. The bidder shall specify the cost of the maintenance support.

5 Testing and acceptance

5.1 It is the bidder’s responsibility to ensure that the equipment is sufficiently tested prior to shipment and installation. During final acceptance testing, the bidder will have to demonstrate full functionality and performance of all system components according to specifications. Prior to final acceptance, all expenditures related to unsatisfactory performance of the equipment, such as the costs of repairs, additional site visits, shipping costs etc., will be at the bidder’s expenses. The costs for all tests and for all inspections to be made under the contract shall be borne by the bidder and shall be deemed to be included in the contract price.

5.2 Factory Acceptance Test (FAT). The tenderer shall arrange a FAT with DHM staff or its representatives prior to the shipment. The FAT shall demonstrate the operation of the required functions on a configuration equivalent to the tendered one. The FAT shall also include an inspection of all documentation to be supplied with the system. The FAT shall proceed according to a check plan, previously approved by the buyer. Eventual missing items or malfunctions will be recorded for further consideration and correction by the supplier. A satisfactory FAT will allow the bidder/tenderer to proceed into the delivery and installation.

5.3 Site Acceptance Test (SAT). A SAT shall be arranged after the completed installation. The purpose of the SAT is to check that all required functions are installed as specified in the contract and that the workings are good enough to start the operation test. The SAT will be conducted according to an agreed plan submitted by the supplier and approved by the buyer.
5.4 **Operational Test (OT).** The reliability and functionality of the individual system items of hardware and software will be checked during an OT. The OT will continue for a period of 30 consecutive working days, and will start immediately after a successful SAT. During the OT, the various functional items shall achieve an availability figure specified in the contract to be signed. Furthermore, all functional requirements shall be checked to be working as specified. In principle, a failure of the OT shall result in the holding of a new OT after corrections by the supplier of the reasons for failure. The procedure shall be repeated until the OT is satisfactorily completed, after which the system receives its Final Acceptance and will be accepted into operational service.

### 6 Warranty

6.1 The warranty period shall be two years starting from the successful completion of the operational test.
Forms and Procedures

Form of Completion Certificate ................................................................. 2-61
Form of Operational Acceptance Certificate ............................................. 2-62
Change Order Procedure and Forms .................................................. 2-63
Change Order Procedure ..................................................................... 2-64
  Annex 1. Request for Change Proposal ............................................... 2-65
  Annex 2. Estimate for Change Proposal ............................................. 2-67
  Annex 3. Acceptance of Estimate .................................................... 2-69
  Annex 4. Change Proposal ............................................................... 2-70
  Annex 5. Change Order .................................................................. 2-73
  Annex 6. Pending Agreement Change Order .................................... 2-74
  Annex 7. Application for Change Proposal ....................................... 2-76
Form of Completion Certificate

Date: __________________
Loan/Credit N°: ________________
IFB N°: ________________

________________________________________________________________________

To: ______________________________________________________________

Dear Ladies and/or Gentlemen,

Pursuant to GC Clause 24 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the Employer dated __________, relating to the ________________, we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below.

1. Description of the Facilities or part thereof: _____________________________

2. Date of Completion: _____________

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

________________________________________________________________________

Title
(Project Manager)
Form of Operational Acceptance Certificate

Date: ____________________________
Loan/Credit N°: ________________
IFB N°: ________________________

To: ______________________________

Dear Ladies and/or Gentlemen,

Pursuant to GC Sub-Clause 25.3 (Operational Acceptance) of the General Conditions of the Contract entered into between yourselves and the Employer dated ________________, relating to the ____________________________, we hereby notify you that the Functional Guarantees of the following part(s) of the Facilities were satisfactorily attained on the date specified below.

1. Description of the Facilities or part thereof: __________________________

2. Date of Operational Acceptance: __________________________

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

_______________________________
Title
(Project Manager)
Change Order Procedure and Forms

Date: __________________
Loan/Credit N°: ______________
IFB N°: ______________

CONTENTS

1. General
2. Change Order Log
3. References for Changes

ANNEXES

Annex 1 Request for Change Proposal
Annex 2 Estimate for Change Proposal
Annex 3 Acceptance of Estimate
Annex 4 Change Proposal
Annex 5 Change Order
Annex 6 Pending Agreement Change Order
Annex 7 Application for Change Proposal
Change Order Procedure

1. General

This section provides samples of procedures and forms for implementing changes in the Facilities during the performance of the Contract in accordance with GC Clause 39 (Change in the Facilities) of the General Conditions.

2. Change Order Log

The Contractor shall keep an up-to-date Change Order Log to show the current status of Requests for Change and Changes authorized or pending, as Annex 8. Entries of the Changes in the Change Order Log shall be made to ensure that the log is up-to-date. The Contractor shall attach a copy of the current Change Order Log in the monthly progress report to be submitted to the Employer.

3. References for Changes

(1) Request for Change as referred to in GC Clause 39 shall be serially numbered CR-X-nnn.

(2) Estimate for Change Proposal as referred to in GC Clause 39 shall be serially numbered CN-X-nnn.

(3) Acceptance of Estimate as referred to in GC Clause 39 shall be serially numbered CA-X-nnn.

(4) Change Proposal as referred to in GC Clause 39 shall be serially numbered CP-X-nnn.

(5) Change Order as referred to in GC Clause 39 shall be serially numbered CO-X-nnn.

Note: (a) Requests for Change issued from the Employer’s Home Office and the Site representatives of the Employer shall have the following respective references:

<table>
<thead>
<tr>
<th>Reference</th>
<th>CR-H-nnn</th>
<th>CR-S-nnn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) The above number “nnn” is the same for Request for Change, Estimate for Change Proposal, Acceptance of Estimate, Change Proposal and Change Order.
Annex 1. Request for Change Proposal

(Employer’s Letterhead)

To: ________________________________  Date: ______________

Attention: ________________________________

Contract Name: ________________________________
Contract Number: ________________________________

Dear Ladies and/or Gentlemen:

With reference to the captioned Contract, you are requested to prepare and submit a Change Proposal for the Change noted below in accordance with the following instructions within ___________ days of the date of this letter______________.

1. Title of Change: ________________________________
2. Change Request No. ________________________________
3. Originator of Change:  Employer: ________________________________
   Contractor (by Application for Change Proposal No. ______): ______
4. Brief Description of Change: ________________________________
5. Facilities and/or Item No. of equipment related to the requested Change: __________
6. Reference drawings and/or technical documents for the request of Change:

   Drawing No./Document No.  Description

7. Detailed conditions or special requirements on the requested Change: __________
8. General Terms and Conditions:

   (a) Please submit your estimate to us showing what effect the requested Change will have on the Contract Price.

   (b) Your estimate shall include your claim for the additional time, if any, for completion of the requested Change.

______________________________
(c) If you have any opinion negative to the adoption of the requested Change in connection with the conformability to the other provisions of the Contract or the safety of the Plant or Facilities, please inform us of your opinion in your proposal of revised provisions.

(d) Any increase or decrease in the work of the Contractor relating to the services of its personnel shall be calculated.

(e) You shall not proceed with the execution of the work for the requested Change until we have accepted and confirmed the amount and nature in writing.

__________________________
(Employer’s Name)

__________________________
(Signature)

__________________________
(Name of signatory)

__________________________
(Title of signatory)
Annex 2. Estimate for Change Proposal

(Contractor’s Letterhead)

To: __________________________  Date: ________________

Attention: __________________________

Contract Name: __________________________

Contract Number: __________________________

Dear Ladies and/or Gentlemen:

With reference to your Request for Change Proposal, we are pleased to notify you of the approximate cost of preparing the below-referenced Change Proposal in accordance with GC Sub-Clause 39.2.1 of the General Conditions. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with GC Sub-Clause 39.2.2, is required before estimating the cost for change work.

1. Title of Change: ________________

2. Change Request No./Rev.: ________________

3. Brief Description of Change: ________________

4. Scheduled Impact of Change: ________________

5. Cost for Preparation of Change Proposal: ____________  

(a) Engineering (Amount)

   (i) Engineer  _____ hrs x _____ rate/hr = ________
   (ii) Draftsperson  _____ hrs x _____ rate/hr = ________
       Sub-total  _____ hrs
       Total Engineering Cost  ________

---

8 Costs shall be in the currencies of the Contract.
### Section VI. Employer’s Requirements

<table>
<thead>
<tr>
<th>(b) Other Cost</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost (a) + (b)</td>
<td></td>
</tr>
</tbody>
</table>

(Contractor’s Name)

(Signature)

(Name of signatory)

(Title of signatory)
Annex 3. Acceptance of Estimate

(Employer’s Letterhead)

To: ____________________________  Date: ________________

Attention: ____________________________

Contract Name: ____________________________
Contract Number: ____________________________

Dear Ladies and/or Gentlemen:

We hereby accept your Estimate for Change Proposal and agree that you should proceed with the preparation of the Change Proposal.

1. Title of Change: ____________________________

2. Change Request No./Rev.: ____________________________

3. Estimate for Change Proposal No./Rev.: ____________________________

4. Acceptance of Estimate No./Rev.: ____________________________

5. Brief Description of Change: ____________________________

6. Other Terms and Conditions: In the event that we decide not to order the Change accepted, you shall be entitled to compensation for the cost of preparation of Change Proposal described in your Estimate for Change Proposal mentioned in para. 3 above in accordance with GC Clause 39 of the General Conditions.

__________________________________________
(Employer’s Name)

__________________________________________
(Signature)

__________________________________________
(Name and Title of signatory)
Annex 4. Change Proposal

(Contractor’s Letterhead)

To: ___________________________ Date: ________________

Attention: ___________________________

Contract Name: ___________________________
Contract Number: ___________________________

Dear Ladies and/or Gentlemen:

In response to your Request for Change Proposal No. ____________________________, we hereby submit our proposal as follows:

1. Title of Change: ___________________________

2. Change Proposal No./Rev.: ___________________________

3. Originator of Change: Employer: ___________________________
   Contractor: ___________________________

4. Brief Description of Change: ___________________________

5. Reasons for Change: ___________________________

6. Facilities and/or Item No. of Equipment related to the requested Change: ___________________________

7. Reference drawings and/or technical documents for the requested Change:

<table>
<thead>
<tr>
<th>Drawing/Document No.</th>
<th>Description</th>
</tr>
</thead>
</table>

8. Estimate of increase/decrease to the Contract Price resulting from Change Proposal: 9

   (Amount)

   (a) Direct material ___________________________

   (b) Major construction equipment ___________________________

   (c) Direct field labor (Total ____ hrs) ___________________________

   (d) Subcontracts ___________________________

   9 Costs shall be in the currencies of the Contract.
(e) Indirect material and labor

(f) Site supervision

(g) Head office technical staff salaries

<table>
<thead>
<tr>
<th>Role</th>
<th>Hours</th>
<th>Rate/hr</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Draftsperson</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(h) Extraordinary costs (computer, travel, etc.)

(i) Fee for general administration, _____ % of Items

(j) Taxes and customs duties

Total lump sum cost of Change Proposal

Cost to prepare Estimate for Change Proposal

9. Additional time for Completion required due to Change Proposal

10. Effect on the Functional Guarantees

11. Effect on the other terms and conditions of the Contract

12. Validity of this Proposal: within [Number] days after receipt of this Proposal by the Employer

13. Other terms and conditions of this Change Proposal:

   (a) You are requested to notify us of your acceptance, comments or rejection of this detailed Change Proposal within ____________ days from your receipt of this Proposal.

   (b) The amount of any increase and/or decrease shall be taken into account in the adjustment of the Contract Price.

   (c) Contractor’s cost for preparation of this Change Proposal:

---

2 Specify where necessary.
Annex 5. Change Order

(Employer’s Letterhead)

To: _________________________ Date: ________________

Attention: _______________________

Contract Name: _______________________

Contract Number: _______________________

Dear Ladies and/or Gentlemen:

We approve the Change Order for the work specified in the Change Proposal (No. ______), and agree to adjust the Contract Price, Time for Completion and/or other conditions of the Contract in accordance with GC Clause 39 of the General Conditions.

1. Title of Change: _______________________

2. Change Request No./Rev.: _______________________

3. Change Order No./Rev.: _______________________

4. Originator of Change: Employer: _______________________

          Contractor: _______________________

5. Authorized Price:

          Ref. No.: _______________________

          Date: _______________________

          Foreign currency portion ______ plus Local currency portion ______

6. Adjustment of Time for Completion

          None

          Increase ______ days

          Decrease ______ days

7. Other effects, if any

          Authorized by: _______________________

          _______________________

          Date: ________________

          (Employer)

          Accepted by: _______________________

          _______________________

          Date: ________________

          (Contractor)
Annex 6. Pending Agreement Change Order

(Employer’s Letterhead)

To: ___________________________ Date: ______________

Attention: ___________________________

Contract Name: ___________________________
Contract Number: ___________________________

Dear Ladies and/or Gentlemen:

We instruct you to carry out the work in the Change Order detailed below in accordance with GC Clause 39 of the General Conditions.

1. Title of Change: ___________________________

2. Employer’s Request for Change Proposal No./Rev.: ___________________________ dated: ______

3. Contractor’s Change Proposal No./Rev.: ___________________________ dated: ______

4. Brief Description of Change: ___________________________

5. Facilities and/or Item No. of equipment related to the requested Change:

6. Reference Drawings and/or technical documents for the requested Change:

   Drawing/Document No. Description

7. Adjustment of Time for Completion:

8. Other change in the Contract terms:

9. Other terms and conditions:
Section VI. Employer’s Requirements

Employer’s Name

Signature

Name of signatory

Title of signatory
Annex 7. Application for Change Proposal

(Contractor’s Letterhead)

To: ____________________________  Date: __________________

Attention: ____________________________

Contract Name: ____________________________
Contract Number: ____________________________

Dear Ladies and/or Gentlemen:

We hereby propose that the below-mentioned work be treated as a Change in the Facilities.

1. Title of Change: ____________________________

2. Application for Change Proposal No./Rev.: ____________________________ dated: ____________________________

3. Brief Description of Change: ____________________________

4. Reasons for Change:

5. Order of Magnitude Estimation (in the currencies of the Contract):

6. Scheduled Impact of Change:

7. Effect on Functional Guarantees, if any:

8. Appendix:

________________________________________________________________________

(Contractor’s Name)

________________________________________________________________________

(Signature)

________________________________________________________________________

(Name of signatory)

________________________________________________________________________

>Title of signatory)
Drawings

List of Preliminary drawings/Sketches to be furnished to Bidder

General layout of Radar site which is used for the construction of Radar Tower and Power Station at Ratanagla, Nalakhola Community Forest, Birendra Nagar-24, Surkhet is indicated below.

Figure 1: Locations of Radar Tower and Power Station in allocated land area
Supplementary Information

Country brief and Radar Location area with general climate:
Nepal is a landlocked south Asian country lies between China to the north and India to the east, west and south with a total land area of 147,181 square kilometer. The country stretches from $80^\circ 4'$ to $88^\circ 12'$ E longitude and $26^\circ 22'$ to $30^\circ 27'$ N latitude. The country looks roughly rectangular in shape with the length from east to west about 885 km and varied width ranging 130 to 260 km from south to north. The elevation of the country increases from 60 m in the south to more than 8848 m the highest peak, Mt. Everest, known as Sagarmatha in the north. It has varied weather and climate. Most parts of the country is mountains and high mountains (Himalaya). The country receives around 1800 mm of annual rainfall and accounts 80% of total rainfall in the monsoon season. In winter season December to February the country experiences some spells of rain and snow in high mountains caused by westerly disturbances also known as winter monsoon. In post monsoon (October, November) and pre monsoon (March, April, May) the country experiences occasionally thunder shower associated with hails. Mainly, the country is divided into five physiographic regions Himalayan, High Mountain, Middle Mountain, Hills and Tarai.

Figure 1: Radar location site at Surkhet and its bordering districts with Development Regions where capital Kathmandu of Nepal lies in Central Development Region (CDR).

District is one of Nepal's seventy-five districts of Nepal located about 600 kilometers (373 mi) west of the national capital Kathmandu. Surkhet is one of five districts in Bheri Zone which in turn belongs to the Mid-Western Development Region (MWDR). Surkhet Valley is one the Inner Terai Valleys of Nepal. The district's area is 2,451 km². It had 288,527 population in 2001 and 350,804 in 2011. Birendranagar is the district headquarters, nominated for capital of the proposed Bheri-Karnali state of the new federal republic. Bordering districts are Jajarkot, Dailekh, and Achham to
the north, Bardiya and Kailali to the south, Salyan district to the east, and Doti to the west. The radar will be installed in Guranse Hill, Within Nalakhola community forest, Ratanagla, Birendra Nagar-24, Surkhet (Fig.1 and 2).

Figure 2: Guranse Hill, within Nalakhola community forest, Ratanagla, Birendra Nagar-24, Surkhet.

Surkhet has a more moderate climate. It varies from tropical (below 300 to 1000 meters) to subtropical warm temperate with Dry winter and Hot summer (1,000 to 2,000 meters) and cool temperate with Dry winter and warm summer (2,000 to 3,000 meters) Winter temperatures drop to about 5 °C and in summer it goes up to 38 °C. Monsoon brings sufficient rainfall during the rainy season. (https://en.wikipedia.org/wiki/Surkhet_District).
Surkhet is accessible by air service and roads from various parts of the country. Ratna highway links it to the rest of Nepal. Karnali Highway, recently constructed and being black topped, will link Surkhet to the remote Western region Karnali (figs.3 and 4). Surkhet Airport near Birendranagar has scheduled flights to Kathmandu, Nepalgunj, Jumla and other districts.

Figure 3: Road approach to from Bus park of Surkhet valley to Ratanagla (Radar location site), a part of Dailekh Highway.
Figure 4: Close up view of the Radar location area including roads
PART 3 – Conditions of Contract and Contract Forms
## Section VII. General Conditions (GC)

### Table of Clauses

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Contract and Interpretation</td>
<td>3-5</td>
</tr>
<tr>
<td>1.</td>
<td>Definitions</td>
<td>3-5</td>
</tr>
<tr>
<td>2.</td>
<td>Contract Documents</td>
<td>3-8</td>
</tr>
<tr>
<td>3.</td>
<td>Interpretation</td>
<td>3-8</td>
</tr>
<tr>
<td>4.</td>
<td>Communications</td>
<td>3-10</td>
</tr>
<tr>
<td>5.</td>
<td>Law and Language</td>
<td>3-10</td>
</tr>
<tr>
<td>6.</td>
<td>Fraud and Corruption</td>
<td>3-10</td>
</tr>
<tr>
<td>B.</td>
<td>Subject Matter of Contract</td>
<td>3-11</td>
</tr>
<tr>
<td>7.</td>
<td>Scope of Facilities</td>
<td>3-11</td>
</tr>
<tr>
<td>8.</td>
<td>Time for Commencement and Completion</td>
<td>3-12</td>
</tr>
<tr>
<td>9.</td>
<td>Contractor’s Responsibilities</td>
<td>3-12</td>
</tr>
<tr>
<td>10.</td>
<td>Employer’s Responsibilities</td>
<td>3-14</td>
</tr>
<tr>
<td>C.</td>
<td>Payment</td>
<td>3-15</td>
</tr>
<tr>
<td>11.</td>
<td>Contract Price</td>
<td>3-15</td>
</tr>
<tr>
<td>12.</td>
<td>Terms of Payment</td>
<td>3-16</td>
</tr>
<tr>
<td>13.</td>
<td>Securities</td>
<td>3-16</td>
</tr>
<tr>
<td>14.</td>
<td>Taxes and Duties</td>
<td>3-17</td>
</tr>
<tr>
<td>D.</td>
<td>Intellectual Property</td>
<td>3-18</td>
</tr>
<tr>
<td>15.</td>
<td>License/Use of Technical Information</td>
<td>3-18</td>
</tr>
<tr>
<td>16.</td>
<td>Confidential Information</td>
<td>3-19</td>
</tr>
<tr>
<td>E.</td>
<td>Execution of the Facilities</td>
<td>3-20</td>
</tr>
<tr>
<td>17.</td>
<td>Representatives</td>
<td>3-20</td>
</tr>
<tr>
<td>18.</td>
<td>Work Program</td>
<td>3-22</td>
</tr>
<tr>
<td>19.</td>
<td>Subcontracting</td>
<td>3-23</td>
</tr>
<tr>
<td>20.</td>
<td>Design and Engineering</td>
<td>3-24</td>
</tr>
<tr>
<td>21.</td>
<td>Procurement</td>
<td>3-27</td>
</tr>
<tr>
<td>22.</td>
<td>Installation</td>
<td>3-28</td>
</tr>
<tr>
<td>23.</td>
<td>Test and Inspection</td>
<td>3-36</td>
</tr>
<tr>
<td>24.</td>
<td>Completion of the Facilities</td>
<td>3-38</td>
</tr>
<tr>
<td>25.</td>
<td>Commissioning and Operational Acceptance</td>
<td>3-40</td>
</tr>
<tr>
<td>F.</td>
<td>Guarantees and Liabilities</td>
<td>3-44</td>
</tr>
</tbody>
</table>
Section V. General Conditions

26. Completion Time Guarantee ................................................................. 3-44
27. Defect Liability .................................................................................. 3-44
28. Functional Guarantees ................................................................. 3-47
29. Patent Indemnity .............................................................................. 3-48
30. Limitation of Liability ................................................................. 3-49

G. Risk Distribution ............................................................................. 3-49

31. Transfer of Ownership .................................................................. 3-49
32. Care of Facilities ............................................................................. 3-50
33. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification ................................................................. 3-51
34. Insurance .......................................................................................... 3-52
35. Unforeseen Conditions .................................................................. 3-55
36. Change in Laws and Regulations .................................................. 3-56
37. Force Majeure .................................................................................. 3-56
38. War Risks ......................................................................................... 3-58

H. Change in Contract Elements ............................................................. 3-59

39. Change in the Facilities .................................................................. 3-59
40. Extension of Time for Completion ................................................ 3-62
41. Suspension ....................................................................................... 3-64
42. Termination ....................................................................................... 3-65
43. Assignment ....................................................................................... 3-72
44. Export Restrictions .......................................................................... 3-72

I. Claims, Disputes and Arbitration ......................................................... 3-73

45. Contractor’s Claims ........................................................................ 3-73
46. Disputes and Arbitration ................................................................. 3-74
General Conditions

Contract and Interpretation

1. Definitions

1.1 The following words and expressions shall have the meanings hereby assigned to them:

“Contract” means the Contract Agreement entered into between the Employer and the Contractor, together with the Contract Documents referred to therein; they shall constitute the Contract, and the term “the Contract” shall in all such documents be construed accordingly.


“GC” means the General Conditions hereof.

“PC” means the Particular Conditions.

“day” means calendar day.

“year” means 365 days.

“month” means calendar month.

“Party” means the Employer or the Contractor, as the context requires, and “Parties” means both of them.

“Employer” means the person named as such in the PC and includes the legal successors or permitted assigns of the Employer.

“Project Manager” means the person appointed by the Employer in the manner provided in GC Sub-Clause 17.1 (Project Manager) hereof and named as such in the PC to perform the duties delegated by the Employer.

“Contractor” means the person(s) whose bid to perform the Contract has been accepted by the Employer and is named as Contractor in the Contract Agreement, and includes the legal successors or permitted assigns of the Contractor.

“Contractor’s Representative” means any person nominated by the Contractor and approved by the Employer in the manner provided in GC Sub-Clause 17.2 (Contractor’s Representative and Construction Manager) hereof to perform the duties delegated by the Contractor.

“Construction Manager” means the person appointed by the Contractor’s Representative in the manner provided in GC Sub-
Clause 17.2.4.

“Subcontractor,” including manufacturers, means any person to whom execution of any part of the Facilities, including preparation of any design or supply of any Plant, is subcontracted directly or indirectly by the Contractor, and includes its legal successors or permitted assigns.

“Dispute Board” (DB) means the person or persons named as such in the PC appointed by agreement between the Employer and the Contractor to make a decision with respect to any dispute or difference between the Employer and the Contractor referred to him or her by the Parties pursuant to GC Sub-Clause 46.1 (Dispute Board) hereof.

“The Bank” means the financing institution named in the PC.

“Contract Price” means the sum specified in Article 2.1 (Contract Price) of the Contract Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.

“Facilities” means the Plant to be supplied and installed, as well as all the Installation Services to be carried out by the Contractor under the Contract.

“Plant” means permanent plant, equipment, machinery, apparatus, materials, articles and things of all kinds to be provided and incorporated in the Facilities by the Contractor under the Contract (including the spare parts to be supplied by the Contractor under GC Sub-Clause 7.3 hereof), but does not include Contractor’s Equipment.

“Installation Services” means all those services ancillary to the supply of the Plant for the Facilities, to be provided by the Contractor under the Contract, such as transportation and provision of marine or other similar insurance, inspection, expediting, site preparation works (including the provision and use of Contractor’s Equipment and the supply of all construction materials required), installation, testing, pre-commissioning, commissioning, operations, maintenance, the provision of operations and maintenance manuals, training, etc… as the case may require.

“Contractor’s Equipment” means all facilities, equipment, machinery, tools, apparatus, appliances or things of every kind required in or for installation, completion and maintenance of Facilities that are to be provided by the Contractor, but does not include Plant, or other things intended to form or forming part of the Facilities.

“Country of Origin” means the countries and territories eligible
under the rules of the Bank as further elaborated in the PC.

“Site” means the land and other places upon which the Facilities are to be installed, and such other land or places as may be specified in the Contract as forming part of the Site.

“Effective Date” means the date of fulfillment of all conditions stated in Article 3 (Effective Date) of the Contract Agreement, from which the Time for Completion shall be counted.

“Time for Completion” means the time within which Completion of the Facilities as a whole (or of a part of the Facilities where a separate Time for Completion of such part has been prescribed) is to be attained, as referred to in GC Clause 8 and in accordance with the relevant provisions of the Contract.

“Completion” means that the Facilities (or a specific part thereof where specific parts are specified in the Contract) have been completed operationally and structurally and put in a tight and clean condition, that all work in respect of Pre-commissioning of the Facilities or such specific part thereof has been completed, and that the Facilities or specific part thereof are ready for Commissioning as provided in GC Clause 24 (Completion) hereof.

“Pre-commissioning” means the testing, checking and other requirements specified in the Employer’s Requirements that are to be carried out by the Contractor in preparation for Commissioning as provided in GC Clause 24 (Completion) hereof.

“Commissioning” means operation of the Facilities or any part thereof by the Contractor following Completion, which operation is to be carried out by the Contractor as provided in GC Sub-Clause 25.1 (Commissioning) hereof, for the purpose of carrying out Guarantee Test(s).

“Guarantee Test(s)” means the test(s) specified in the Employer’s Requirements to be carried out to ascertain whether the Facilities or a specified part thereof is able to attain the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, in accordance with the provisions of GC Sub-Clause 25.2 (Guarantee Test) hereof.

“Operational Acceptance” means the acceptance by the Employer of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor’s fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of GC Clause 28 (Functional Guarantees) hereof and shall include deemed
acceptance in accordance with GC Clause 25 (Commissioning and Operational Acceptance) hereof.

“Defect Liability Period” means the period of validity of the warranties given by the Contractor commencing at Completion of the Facilities or a part thereof, during which the Contractor is responsible for defects with respect to the Facilities (or the relevant part thereof) as provided in GC Clause 27 (Defect Liability) hereof.

2. Contract Documents

2.1 Subject to Article 1.2 (Order of Precedence) of the Contract Agreement, all documents forming part of the Contract (and all parts thereof) are intended to be correlative, complementary and mutually explanatory. The Contract shall be read as a whole.

3. Interpretation

3.1 In the Contract, except where the context requires otherwise:

(a) words indicating one gender include all genders;

(b) words indicating the singular also include the plural and words indicating the plural also include the singular;

(c) provisions including the word “agree,” “agreed,” or “agreement” require the agreement to be recorded in writing;

(d) the word “tender” is synonymous with “bid,” “tenderer,” with “bidder,” and “tender documents” with “bidding documents,” and

(e) “Written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

3.2 Incoterms

Unless inconsistent with any provision of the Contract, the meaning of any trade term and the rights and obligations of Parties thereunder shall be as prescribed by Incoterms.

Incoterms means international rules for interpreting trade terms published by the International Chamber of Commerce (latest edition), 38 Cours Albert 1er, 75008 Paris, France.

3.4 Entire Agreement

Subject to GC Sub-Clause 16.4 hereof, the Contract constitutes the entire agreement between the Employer and Contractor with respect to the subject matter of Contract and supersedes all communications, negotiations and agreements (whether written
or oral) of Parties with respect thereto made prior to the date of Contract.

3.5 Amendment

No amendment or other variation of the Contract shall be effective unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each Party hereto.

3.6 Independent Contractor

The Contractor shall be an independent contractor performing the Contract. The Contract does not create any agency, partnership, joint venture or other joint relationship between the Parties hereto. Subject to the provisions of the Contract, the Contractor shall be solely responsible for the manner in which the Contract is performed. All employees, representatives or Subcontractors engaged by the Contractor in connection with the performance of the Contract shall be under the complete control of the Contractor and shall not be deemed to be employees of the Employer, and nothing contained in the Contract or in any subcontract awarded by the Contractor shall be construed to create any contractual relationship between any such employees, representatives or Subcontractors and the Employer.

3.7 Non-Waiver

3.7.1 Subject to GC Sub-Clause 3.7.2 below, no relaxation, forbearance, delay or indulgence by either Party in enforcing any of the terms and conditions of the Contract or the granting of time by either Party to the other shall prejudice, affect or restrict the rights of that Party under the Contract, nor shall any waiver by either Party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

3.7.2 Any waiver of a Party’s rights, powers or remedies under the Contract must be in writing, must be dated and signed by an authorized representative of the Party granting such waiver, and must specify the right and the extent to which it is being waived.

3.8 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

3.9 Country of Origin

“Origin” means the place where the plant and component parts
thereof are mined, grown, produced or manufactured, and from which the services are provided. Plant components are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that is substantially in its basic characteristics or in purpose or utility from its components.

4. Communications 4.1 Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

(a) in writing and delivered against receipt; and

(b) delivered, sent or transmitted to the address for the recipient’s communications as stated in the Contract Agreement.

When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Project Manager, a copy shall be sent to the Project Manager or the other Party, as the case may be.

5. Law and Language 5.1 The Contract shall be governed by and interpreted in accordance with laws of the country specified in the PC.

5.2 The ruling language of the Contract shall be that stated in the PC.

5.3 The language for communications shall be the ruling language unless otherwise stated in the PC.

6. Fraud and Corruption 6.1 If the Employer determines that the Contractor and/or any of its personnel, or its agents, or its Subcontractors, sub-consultants, services providers, suppliers and/or their employees has engaged in corrupt, fraudulent, collusive coercive, or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contractor’s employment under the Contract and expel him from the Site, and the provisions of Clause 42 shall apply as if such expulsion had been made under Sub-Clause 42.2.1 (c).

For the purposes of this Sub-Clause,

(i) “corrupt practice” is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

(ii) “fraudulent practice” is any act or omission, including a misrepresentation, that knowingly or recklessly

10 “Another party” refers to a public official acting in relation to the procurement process or contract execution. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.
misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation\(^\text{11}\);

(iii) “collusive practice” is an arrangement between two or more parties\(^\text{12}\) designed to achieve an improper purpose, including to influence improperly the actions of another party;

(iv) “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party\(^\text{13}\) or the property of the party to influence improperly the actions of a party;

(v) “obstructive practice” is

(aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or

(bb) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under Sub-Clause9.8.

**Subject Matter of Contract**

7. **Scope of Facilities**

7.1 Unless otherwise expressly limited in the Employer’s Requirements, the Contractor’s obligations cover the provision of all Plant and the performance of all Installation Services required for the design, and the manufacture (including procurement, quality assurance, construction, installation, associated civil works, Pre-commissioning and delivery) of the Plant, and the installation, completion and commissioning of the Facilities in accordance with the plans, procedures, specifications, drawings, codes and any other documents as specified in the Section, Employer’s Requirements. Such specifications include, but are not limited to, the provision of supervision and engineering services; the supply of labor,

---

\(^{11}\) “Party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.

\(^{12}\) “Parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non-competitive levels.

\(^{13}\) “Party” refers to a participant in the procurement process or contract execution.
materials, equipment, spare parts (as specified in GC Sub-Clause 7.3 below) and accessories; Contractor’s Equipment; construction utilities and supplies; temporary materials, structures and facilities; transportation (including, without limitation, unloading and hauling to, from and at the Site); and storage, except for those supplies, works and services that will be provided or performed by the Employer, as set forth in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer.

7.2 The Contractor shall, unless specifically excluded in the Contract, perform all such work and/or supply all such items and materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Completion of the Facilities as if such work and/or items and materials were expressly mentioned in the Contract.

7.3 In addition to the supply of Mandatory Spare Parts included in the Contract, the Contractor agrees to supply spare parts required for the operation and maintenance of the Facilities for the period specified in the PC and the provisions, if any, specified in the PC. However, the identity, specifications and quantities of such spare parts and the terms and conditions relating to the supply thereof are to be agreed between the Employer and the Contractor, and the price of such spare parts shall be that given in Price Schedule No. 6, which shall be added to the Contract Price. The price of such spare parts shall include the purchase price therefor and other costs and expenses (including the Contractor’s fees) relating to the supply of spare parts.

8. Time for Commencement and Completion

8.1 The Contractor shall commence work on the Facilities within the period specified in the PC and without prejudice to GC Sub-Clause 26.2 hereof, the Contractor shall thereafter proceed with the Facilities in accordance with the time schedule specified in the Appendix to the Contract Agreement titled Time Schedule.

8.2 The Contractor shall attain Completion of the Facilities or of a part where a separate time for Completion of such part is specified in the Contract, within the time stated in the PC or within such extended time to which the Contractor shall be entitled under GC Clause 40 hereof.

9. Contractor’s Responsibilities

9.1 The Contractor shall design, manufacture including associated purchases and/or subcontracting, install and complete the Facilities in accordance with the Contract. When completed, the Facilities should be fit for the purposes for which they are intended as defined in the Contract.
9.2 The Contractor confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the Facilities including any data as to boring tests provided by the Employer, and on the basis of information that the Contractor could have obtained from a visual inspection of the Site if access thereto was available and of other data readily available to it relating to the Facilities as of the date twenty-eight (28) days prior to bid submission. The Contractor acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Facilities.

9.3 The Contractor shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, visas for the Contractor’s and Subcontractor’s personnel and entry permits for all imported Contractor’s Equipment. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Employer under GC Sub-Clause 10.3 hereof and that are necessary for the performance of the Contract.

9.4 The Contractor shall comply with all laws in force in the country where the Facilities are to be implemented. The laws will include all local, state, national or other laws that affect the performance of the Contract and bind upon the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel, but without prejudice to GC Sub-Clause 10.1 hereof.

9.5 Any Plant and Installation Services that will be incorporated in or be required for the Facilities and other supplies shall have their origin as specified under GC Clause 1 (Country of Origin). Any subcontractors retained by the Contractor shall be from a country as specified in GC Clause 1 (Country of Origin).

9.6 The Contractor shall permit the Bank to inspect the Contractor’s accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by the Bank, if so required by the Bank.

9.7 If the Contractor is a joint venture, or association (JVA) of two or more persons, all such persons shall be jointly and severally
bound to the Employer for the fulfillment of the provisions of the Contract, unless otherwise specified in the PC, and shall designate one of such persons to act as a leader with authority to bind the JVA. The composition or the constitution of the JVA shall not be altered without the prior consent of the Employer.

9.8 The Contractor shall permit, and shall cause its Subcontractors and sub-consultants to permit, the Bank and/or persons appointed by the Bank to inspect the Site and all accounts and records relating to the performance of the Contract and the submission of the Bid, and to have such accounts and records audited by auditors appointed by the Bank if requested by the Bank. The Contractor’s and its Subcontractors’ and sub-consultants’ attention is drawn to Sub-Clause 6.1 [Fraud and Corruption] which provides, inter alia, that acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under Sub-Clause 9.8 constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Bank’s prevailing sanctions procedures).

10. Employer’s Responsibilities

10.1 All information and/or data to be supplied by the Employer as described in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, shall be deemed to be accurate, except when the Employer expressly states otherwise.

10.2 The Employer shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way, as specified in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer. The Employer shall give full possession of and accord all rights of access thereto on or before the date(s) specified in that Appendix.

10.3 The Employer shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located which (a) such authorities or undertakings require the Employer to obtain in the Employer’s name, (b) are necessary for the execution of the Contract, including those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract, and (c) are specified in the Appendix (Scope of Works and Supply by the Employer).

10.4 If requested by the Contractor, the Employer shall use its best endeavors to assist the Contractor in obtaining in a timely and
expeditious manner all permits, approvals and/or licenses necessary for the execution of the Contract from all local, state or national government authorities or public service undertakings that such authorities or undertakings require the Contractor or Subcontractors or the personnel of the Contractor or Subcontractors, as the case may be, to obtain.

10.5 Unless otherwise specified in the Contract or agreed upon by the Employer and the Contractor, the Employer shall provide sufficient, properly qualified operating and maintenance personnel; shall supply and make available all raw materials, utilities, lubricants, chemicals, catalysts, other materials and facilities; and shall perform all work and services of whatsoever nature, including those required by the Contractor to properly carry out Pre-commissioning, Commissioning and Guarantee Tests, all in accordance with the provisions of the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, at or before the time specified in the program furnished by the Contractor under GC Sub-Clause 18.2 hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.

10.6 The Employer shall be responsible for the continued operation of the Facilities after Completion, in accordance with GC Sub-Clause 24.8, and shall be responsible for facilitating the Guarantee Test(s) for the Facilities, in accordance with GC Sub-Clause 25.2.

10.7 All costs and expenses involved in the performance of the obligations under this GC Clause 10 shall be the responsibility of the Employer, save those to be incurred by the Contractor with respect to the performance of Guarantee Tests, in accordance with GC Sub-Clause 25.2.

10.8 In the event that the Employer shall be in breach of any of his obligations under this Clause, the additional cost incurred by the Contractor in consequence thereof shall be determined by the Project Manager and added to the Contract Price.

**Payment**

**11. Contract Price**

11.1 The Contract Price shall be as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement.

11.2 Unless an adjustment clause is provided for in the PC, the Contract Price shall be a firm lump sum not subject to any alteration, except in the event of a Change in the Facilities or as otherwise provided in the Contract.

11.3 Subject to GC Sub-Clauses 9.2, 10.1 and 35 hereof, the Contractor shall be deemed to have satisfied itself as to the
correctness and sufficiency of the Contract Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.

12. Terms of Payment

12.1 The Contract Price shall be paid as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement and in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, which also outlines the procedures to be followed in making application for and processing payments.

12.2 No payment made by the Employer herein shall be deemed to constitute acceptance by the Employer of the Facilities or any part(s) thereof.

12.3 In the event that the Employer fails to make any payment by its respective due date or within the period set forth in the Contract, the Employer shall pay to the Contractor interest on the amount of such delayed payment at the rate(s) shown in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, for the period of delay until payment has been made in full, whether before or after judgment or arbitrage award.

12.4 The currency or currencies in which payments are made to the Contractor under this Contract shall be specified in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, subject to the general principle that payments will be made in the currency or currencies in which the Contract Price has been stated in the Contractor’s bid.

13. Securities

13.1 Issuance of Securities

The Contractor shall provide the securities specified below in favor of the Employer at the times, and in the amount, manner and form specified below.

13.2 Advance Payment Security

13.2.1 The Contractor shall, within twenty-eight (28) days of the notification of contract award, provide a security in an amount equal to the advance payment calculated in accordance with the Appendix to the Contract Agreement titled Terms and Procedures of Payment, and in the same currency or currencies.

13.2.2 The security shall be in the form provided in the bidding documents or in another form acceptable to the Employer. The amount of the security shall be reduced in proportion to the value of the Facilities executed by and paid to the Contractor from time to time, and shall automatically become null and void when the full amount
of the advance payment has been recovered by the Employer. The security shall be returned to the Contractor immediately after its expiration.

13.3 Performance Security

13.3.1 The Contractor shall, within twenty-eight (28) days of the notification of contract award, provide a security for the due performance of the Contract in the amount specified in the PC.

13.3.2 The performance security shall be denominated in the currency or currencies of the Contract, or in a freely convertible currency acceptable to the Employer, and shall be in the form provided in Section IX, Contract Forms, corresponding to the type of bank guarantee stipulated by the Employer in the PC, or in another form acceptable to the Employer.

13.3.3 Unless otherwise specified in the PC, the security shall be reduced by half on the date of the Operational Acceptance. The Security shall become null and void, or shall be reduced pro rata to the Contract Price of a part of the Facilities for which a separate Time for Completion is provided, five hundred and forty (540) days after Completion of the Facilities or three hundred and sixty five (365) days after Operational Acceptance of the Facilities, whichever occurs first; provided, however, that if the Defects Liability Period has been extended on any part of the Facilities pursuant to GC Sub-Clause 27.8 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part. The security shall be returned to the Contractor immediately after its expiration, provided, however, that if the Contractor, pursuant to GC Sub-Clause 27.10, is liable for an extended defect liability obligation, the performance security shall be extended for the period specified in the PC pursuant to GC Sub-Clause 27.10 and up to the amount specified in the PC.

13.3.4 The Employer shall not make a claim under the Performance Security, except for amounts to which the Employer is entitled under the Contract. The Employer shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security to the extent to which the Employer was not entitled to make the claim.

14. Taxes and 14.1 Except as otherwise specifically provided in the Contract, the Contractor shall bear and pay all taxes, duties, levies and
Duties

charges assessed on the Contractor, its Subcontractors or their employees by all municipal, state or national government authorities in connection with the Facilities in and outside of the country where the Site is located.

14.2 Notwithstanding GC Sub-Clause 14.1 above, the Employer shall bear and promptly pay

(a) all customs and import duties for the Plant specified in Price Schedule No. 1; and

(b) other domestic taxes such as, sales tax and value added tax (VAT) on the Plant specified in Price Schedules No. 1 and No. 2 and that is to be incorporated into the Facilities, and on the finished goods, imposed by the law of the country where the Site is located.

14.3 If any tax exemptions, reductions, allowances or privileges may be available to the Contractor in the country where the Site is located, the Employer shall use its best endeavors to enable the Contractor to benefit from any such tax savings to the maximum allowable extent.

14.4 For the purpose of the Contract, it is agreed that the Contract Price specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement is based on the taxes, duties, levies and charges prevailing at the date twenty-eight (28) days prior to the date of bid submission in the country where the Site is located (hereinafter called “Tax” in this GC Sub-Clause 14.4). If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the performance of Contract, which was or will be assessed on the Contractor, Subcontractors or their employees in connection with performance of the Contract, an equitable adjustment of the Contract Price shall be made to fully take into account any such change by addition to the Contract Price or deduction therefrom, as the case may be, in accordance with GC Clause 36 hereof.

15. License/Use of Technical Information

15.1 For the operation and maintenance of the Plant, the Contractor hereby grants a non-exclusive and non-transferable license (without the right to sub-license) to the Employer under the patents, utility models or other industrial property rights owned by the Contractor or by a third Party from whom the Contractor has received the right to grant licenses thereunder, and shall also grant to the Employer a non-exclusive and non-transferable right (without the right to sub-license) to use the
Section VII. General Conditions

know-how and other technical information disclosed to the Employer under the Contract. Nothing contained herein shall be construed as transferring ownership of any patent, utility model, trademark, design, copyright, know-how or other intellectual property right from the Contractor or any third Party to the Employer.

15.2 The copyright in all drawings, documents and other materials containing data and information furnished to the Employer by the Contractor herein shall remain vested in the Contractor or, if they are furnished to the Employer directly or through the Contractor by any third Party, including suppliers of materials, the copyright in such materials shall remain vested in such third Party.

16. Confidential Information

16.1 The Employer and the Contractor shall keep confidential and shall not, without the written consent of the other Party hereto, divulge to any third Party any documents, data or other information furnished directly or indirectly by the other Party hereto in connection with the Contract, whether such information has been furnished prior to, during or following termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this GC Clause 16.

16.2 The Employer shall not use such documents, data and other information received from the Contractor for any purpose other than the operation and maintenance of the Facilities. Similarly, the Contractor shall not use such documents, data and other information received from the Employer for any purpose other than the design, procurement of Plant, construction or such other work and services as are required for the performance of the Contract.

16.3 The obligation of a Party under GC Sub-Clauses 16.1 and 16.2 above, however, shall not apply to that information which

(a) now or hereafter enters the public domain through no fault of that Party

(b) can be proven to have been possessed by that Party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other Party hereto

(c) otherwise lawfully becomes available to that Party from
a third Party that has no obligation of confidentiality.

16.4 The above provisions of this GC Clause 16 shall not in any way modify any undertaking of confidentiality given by either of the Parties hereto prior to the date of the Contract in respect of the Facilities or any part thereof.

16.5 The provisions of this GC Clause 16 shall survive termination, for whatever reason, of the Contract.

**Execution of the Facilities**

17. **Representatives**

17.1 **Project Manager**

If the Project Manager is not named in the Contract, then within fourteen (14) days of the Effective Date, the Employer shall appoint and notify the Contractor in writing of the name of the Project Manager. The Employer may from time to time appoint some other person as the Project Manager in place of the person previously so appointed, and shall give a notice of the name of such other person to the Contractor without delay. No such appointment shall be made at such a time or in such a manner as to impede the progress of work on the Facilities. Such appointment shall only take effect upon receipt of such notice by the Contractor. The Project Manager shall represent and act for the Employer at all times during the performance of the Contract. All notices, instructions, orders, certificates, approvals and all other communications under the Contract shall be given by the Project Manager, except as herein otherwise provided.

All notices, instructions, information and other communications given by the Contractor to the Employer under the Contract shall be given to the Project Manager, except as herein otherwise provided.

17.2 **Contractor’s Representative & Construction Manager**

17.2.1 If the Contractor’s Representative is not named in the Contract, then within fourteen (14) days of the Effective Date, the Contractor shall appoint the Contractor’s Representative and shall request the Employer in writing to approve the person so appointed. If the Employer makes no objection to the appointment within fourteen (14) days, the Contractor’s Representative shall be deemed to have been approved. If the Employer objects to the appointment within fourteen (14) days giving the reason therefor, then the Contractor shall appoint a replacement within fourteen (14) days of such objection, and the foregoing provisions of this GC
Sub-Clause 17.2.1 shall apply thereto.

17.2.2 The Contractor’s Representative shall represent and act for the Contractor at all times during the performance of the Contract and shall give to the Project Manager all the Contractor’s notices, instructions, information and all other communications under the Contract.

All notices, instructions, information and all other communications given by the Employer or the Project Manager to the Contractor under the Contract shall be given to the Contractor’s Representative or, in its absence, its deputy, except as herein otherwise provided.

The Contractor shall not revoke the appointment of the Contractor’s Representative without the Employer’s prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor’s Representative, pursuant to the procedure set out in GC Sub-Clause 17.2.1.

17.2.3 The Contractor’s Representative may, subject to the approval of the Employer which shall not be unreasonably withheld, at any time delegate to any person any of the powers, functions and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor’s Representative, and shall specify the powers, functions and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the Project Manager.

Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this GC Sub-Clause 17.2.3 shall be deemed to be an act or exercise by the Contractor’s Representative.

17.2.4 From the commencement of installation of the Facilities at the Site until Completion, the Contractor’s Representative shall appoint a suitable person as the Construction Manager. The Construction Manager shall supervise all work done at the Site by the Contractor and shall be present at the Site throughout normal working hours except when on leave, sick or absent for reasons connected with the proper performance of the Contract. Whenever the Construction Manager is absent from the Site, a suitable person shall be appointed to act as the Construction Manager’s deputy.

17.2.5 The Employer may by notice to the Contractor object to any
representative or person employed by the Contractor in the
execution of the Contract who, in the reasonable opinion of
the Employer, may behave inappropriately, may be
incompetent or negligent, or may commit a serious breach of
the Site regulations provided under GC Sub-Clause 22.3. The
Employer shall provide evidence of the same, whereupon the
Contractor shall remove such person from the Facilities.

17.2.6 If any representative or person employed by the Contractor
is removed in accordance with GC Sub-Clause 17.2.5, the
Contractor shall, where required, promptly appoint a
replacement.

18. Work Program

18.1 Contractor’s Organization

The Contractor shall supply to the Employer and the Project
Manager a chart showing the proposed organization to be
established by the Contractor for carrying out work on the
Facilities within twenty-one (21) days of the Effective Date.
The chart shall include the identities of the key personnel and
the curricula vitae of such key personnel to be employed shall
be supplied together with the chart. The Contractor shall
promptly inform the Employer and the Project Manager in
writing of any revision or alteration of such an organization
chart.

18.2 Program of Performance

Within twenty-eight (28) days after the Effective Date, the
Contractor shall submit to the Project Manager a detailed
program of performance of the Contract, made in a form
acceptable to the Project Manager and showing the sequence
in which it proposes to design, manufacture, transport,
assemble, install and pre-commission the Facilities, as well as
the date by which the Contractor reasonably requires that the
Employer shall have fulfilled its obligations under the
Contract so as to enable the Contractor to execute the
Contract in accordance with the program and to achieve
Completion, Commissioning and Acceptance of the Facilities
in accordance with the Contract. The program so submitted
by the Contractor shall accord with the Time Schedule
included in the Appendix to the Contract Agreement titled
Time Schedule, and any other dates and periods specified in
the Contract. The Contractor shall update and revise the
program as and when appropriate or when required by the
Project Manager, but without modification in the Times for
Completion specified in the PC pursuant to Sub-Clause 8.2
and any extension granted in accordance with GC Clause 40,
and shall submit all such revisions to the Project Manager.
18.3 **Progress Report**

The Contractor shall monitor progress of all the activities specified in the program referred to in GC Sub-Clause 18.2 above, and supply a progress report to the Project Manager every month.

The progress report shall be in a form acceptable to the Project Manager and shall indicate: (a) percentage completion achieved compared with the planned percentage completion for each activity; and (b) where any activity is behind the program, giving comments and likely consequences and stating the corrective action being taken.

18.4 **Progress of Performance**

If at any time the Contractor’s actual progress falls behind the program referred to in GC Sub-Clause 18.2, or it becomes apparent that it will so fall behind, the Contractor shall, at the request of the Employer or the Project Manager, prepare and submit to the Project Manager a revised program, taking into account the prevailing circumstances, and shall notify the Project Manager of the steps being taken to expedite progress so as to attain Completion of the Facilities within the Time for Completion under GC Sub-Clause 8.2, any extension thereof entitled under GC Sub-Clause 40.1, or any extended period as may otherwise be agreed upon between the Employer and the Contractor.

18.5 **Procedures**

The Contract shall be executed in accordance with the Contract Documents including the procedures given in the Forms and Procedures of the Employer’s Requirements.

The Contractor may execute the Contract in accordance with its own standard project execution plans and procedures to the extent that they do not conflict with the provisions contained in the Contract.

19. **Subcontracting**

19.1 The Appendix to the Contract Agreement titled List of Major Items of Plant and Installation Services and List of Approved Sub-contractors, specifies major items of supply or services and a list of approved Subcontractors against each item, including manufacturers. In so far as no Subcontractors are listed against any such item, the Contractor shall prepare a list of Subcontractors for such item for inclusion in such list. The Contractor may from time to time propose any addition to or deletion from any such list. The Contractor shall submit any such list or any modification thereto to the Employer for its approval in sufficient time so as not to impede the progress of
work on the Facilities. Such approval by the Employer for any of the Subcontractors shall not relieve the Contractor from any of its obligations, duties or responsibilities under the Contract.

19.2 The Contractor shall select and employ its Subcontractors for such major items from those listed in the lists referred to in GC Sub-Clause 19.1.

19.3 For items or parts of the Facilities not specified in the Appendix to the Contract Agreement titled List of Major Items of Plant and Installation Services and List of Approved Subcontractors, the Contractor may employ such Subcontractors as it may select, at its discretion.

19.4 Each sub-contract shall include provisions which would entitle the Employer to require the sub-contract to be assigned to the Employer under GC 19.5 (if and when applicable), or in event of termination by the Employer under GC 42.2.

19.5 If a sub-contractor's obligations extend beyond the expiry date of the relevant Defects Liability Period and the Project Manager, prior to that date, instructs the Contractor to assign the benefits of such obligations to the Employer, then the Contractor shall do so.

20. Design and Engineering

20.1 Specifications and Drawings

20.1.1 The Contractor shall execute the basic and detailed design and the engineering work in compliance with the provisions of the Contract, or where not so specified, in accordance with good engineering practice.

The Contractor shall be responsible for any discrepancies, errors or omissions in the specifications, drawings and other technical documents that it has prepared, whether such specifications, drawings and other documents have been approved by the Project Manager or not, provided that such discrepancies, errors or omissions are not because of inaccurate information furnished in writing to the Contractor by or on behalf of the Employer.

20.1.2 The Contractor shall be entitled to disclaim responsibility for any design, data, drawing, specification or other document, or any modification thereof provided or designated by or on behalf of the Employer, by giving a notice of such disclaimer to the Project Manager.

20.2 Codes and Standards

Wherever references are made in the Contract to codes and
standards in accordance with which the Contract shall be executed, the edition or the revised version of such codes and standards current at the date twenty-eight (28) days prior to date of bid submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied subject to approval by the Employer and shall be treated in accordance with GC Clause 39.

20.3 Approval/Review of Technical Documents by Project Manager

20.3.1 The Contractor shall prepare or cause its Subcontractors to prepare, and furnish to the Project Manager the documents listed in the Appendix to the Contract Agreement titled List of Documents for Approval or Review, for its approval or review as specified and in accordance with the requirements of GC Sub-Clause 18.2 (Program of Performance).

Any part of the Facilities covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager’s approval thereof.

GC Sub-Clauses 20.3.2 through 20.3.7 shall apply to those documents requiring the Project Manager’s approval, but not to those furnished to the Project Manager for its review only.

20.3.2 Within fourteen (14) days after receipt by the Project Manager of any document requiring the Project Manager’s approval in accordance with GC Sub-Clause 20.3.1, the Project Manager shall either return one copy thereof to the Contractor with its approval endorsed thereon or shall notify the Contractor in writing of its disapproval thereof and the reasons therefor and the modifications that the Project Manager proposes.

If the Project Manager fails to take such action within the said fourteen (14) days, then the said document shall be deemed to have been approved by the Project Manager.

20.3.3 The Project Manager shall not disapprove any document, except on the grounds that the document does not comply with the Contract or that it is contrary to good engineering practice.

20.3.4 If the Project Manager disapproves the document, the Contractor shall modify the document and resubmit it
for the Project Manager’s approval in accordance with GC Sub-Clause 20.3.2. If the Project Manager approves the document subject to modification(s), the Contractor shall make the required modification(s), whereupon the document shall be deemed to have been approved.

20.3.5 If any dispute or difference occurs between the Employer and the Contractor in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) thereto that cannot be settled between the Parties within a reasonable period, then such dispute or difference may be referred to a Dispute Board for determination in accordance with GC Sub-Clause 46.1 hereof. If such dispute or difference is referred to a Dispute Board, the Project Manager shall give instructions as to whether and if so, how, performance of the Contract is to proceed. The Contractor shall proceed with the Contract in accordance with the Project Manager’s instructions, provided that if the Dispute Board upholds the Contractor’s view on the dispute and if the Employer has not given notice under GC Sub-Clause 46.3 hereof, then the Contractor shall be reimbursed by the Employer for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions as the Dispute Board shall decide, and the Time for Completion shall be extended accordingly.

20.3.6 The Project Manager’s approval, with or without modification of the document furnished by the Contractor, shall not relieve the Contractor of any responsibility or liability imposed upon it by any provisions of the Contract except to the extent that any subsequent failure results from modifications required by the Project Manager.

20.3.7 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the Project Manager an amended document and obtained the Project Manager’s approval thereof, pursuant to the provisions of this GC Sub-Clause 20.3.

If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of GC Clause 39 shall apply to such request.
21. Procurement

21.1 Plant

Subject to GC Sub-Clause 14.2, the Contractor shall procure and transport all Plant in an expeditious and orderly manner to the Site.

21.2 Employer-Supplied Plant

If the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, provides that the Employer shall furnish any specific items to the Contractor, the following provisions shall apply:

21.2.1 The Employer shall, at its own risk and expense, transport each item to the place on or near the Site as agreed upon by the Parties and make such item available to the Contractor at the time specified in the program furnished by the Contractor, pursuant to GC Sub-Clause 18.2, unless otherwise mutually agreed.

21.2.2 Upon receipt of such item, the Contractor shall inspect the same visually and notify the Project Manager of any detected shortage, defect or default. The Employer shall immediately remedy any shortage, defect or default, or the Contractor shall, if practicable and possible, at the request of the Employer, remedy such shortage, defect or default at the Employer’s cost and expense. After inspection, such item shall fall under the care, custody and control of the Contractor. The provision of this GC Sub-Clause 21.2.2 shall apply to any item supplied to remedy any such shortage or default or to substitute for any defective item, or shall apply to defective items that have been repaired.

21.2.3 The foregoing responsibilities of the Contractor and its obligations of care, custody and control shall not relieve the Employer of liability for any undetected shortage, defect or default, nor place the Contractor under any liability for any such shortage, defect or default whether under GC Clause 27 or under any other provision of Contract.

21.3 Transportation

21.3.1 The Contractor shall at its own risk and expense transport all the materials and the Contractor’s Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.

21.3.2 Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport operated by any person to carry the materials
and the Contractor’s Equipment.

21.3.3 Upon dispatch of each shipment of materials and the Contractor’s Equipment, the Contractor shall notify the Employer by telex, cable, facsimile or electronic means, of the description of the materials and of the Contractor’s Equipment, the point and means of dispatch, and the estimated time and point of arrival in the country where the Site is located, if applicable, and at the Site. The Contractor shall furnish the Employer with relevant shipping documents to be agreed upon between the Parties.

21.3.4 The Contractor shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the materials and the Contractor’s Equipment to the Site. The Employer shall use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any claim for damage to roads, bridges or any other traffic facilities that may be caused by the transport of the materials and the Contractor’s Equipment to the Site.

21.4 Customs Clearance

The Contractor shall, at its own expense, handle all imported materials and Contractor’s Equipment at the point(s) of import and shall handle any formalities for customs clearance, subject to the Employer’s obligations under GC Sub-Clause 14.2, provided that if applicable laws or regulations require any application or act to be made by or in the name of the Employer, the Employer shall take all necessary steps to comply with such laws or regulations. In the event of delays in customs clearance that are not the fault of the Contractor, the Contractor shall be entitled to an extension in the Time for Completion, pursuant to GC Clause 40.

22. Installation

22.1 Setting Out/Supervision

22.1.1 Bench Mark: The Contractor shall be responsible for the true and proper setting-out of the Facilities in relation to bench marks, reference marks and lines provided to it in writing by or on behalf of the Employer.

If, at any time during the progress of installation of the Facilities, any error shall appear in the position, level or alignment of the Facilities, the Contractor shall
forthwith notify the Project Manager of such error and, at its own expense, immediately rectify such error to the reasonable satisfaction of the Project Manager. If such error is based on incorrect data provided in writing by or on behalf of the Employer, the expense of rectifying the same shall be borne by the Employer.

22.1.2 Contractor’s Supervision: The Contractor shall give or provide all necessary superintendence during the installation of the Facilities, and the Construction Manager or its deputy shall be constantly on the Site to provide full-time superintendence of the installation. The Contractor shall provide and employ only technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand.

22.2 Labor:

22.2.1 Engagement of Staff and Labor

Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labor, local or otherwise, and for their payment, housing, feeding and transport.

The Contractor shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled and unskilled labor as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labor that has the necessary skills.

The Contractor shall be responsible for obtaining all necessary permit(s) and/or visa(s) from the appropriate authorities for the entry of all labor and personnel to be employed on the Site into the country where the Site is located. The Employer will, if requested by the Contractor, use his best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national or government permission required for bringing in the Contractor’s personnel.

The Contractor shall at its own expense provide the means of repatriation to all of its and its Subcontractor’s personnel employed on the Contract at the Site to the place where they were recruited or to their domicile. It shall also provide suitable temporary maintenance of all such persons from the cessation of their employment on the Contract to the date
programmed for their departure. In the event that the Contractor defaults in providing such means of transportation and temporary maintenance, the Employer may provide the same to such personnel and recover the cost of doing so from the Contractor.

22.2.2 Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labor from amongst the Employer’s Personnel.

22.2.3 Labor Laws

The Contractor shall comply with all the relevant labor Laws applicable to the Contractor’s Personnel, including Laws relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights.

The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous or disorderly conduct or behavior by or amongst its employees and the labor of its Subcontractors.

The Contractor shall, in all dealings with its labor and the labor of its Subcontractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious or other customs and all local laws and regulations pertaining to the employment of labor.

22.2.4 Rates of Wages and Conditions of Labor

The Contractor shall pay rates of wages, and observe conditions of labor, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.

The Contractor shall inform the Contractor’s Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages and allowances as are chargeable under the Laws for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as
may be imposed on him by such Laws.

22.2.5 Working Hours

No work shall be carried out on the Site on locally recognized days of rest, or outside the normal working hours stated in the PC, unless:

(a) otherwise stated in the Contract,

(b) the Project Manager gives consent, or

(c) the work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Project Manager.

If and when the Contractor considers it necessary to carry out work at night or on public holidays so as to meet the Time for Completion and requests the Project Manager’s consent thereto, the Project Manager shall not unreasonably withhold such consent.

This Sub-Clause shall not apply to any work which is customarily carried out by rotary or double-shifts.

22.2.6 Facilities for Staff and Labor

Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor’s Personnel. The Contractor shall also provide facilities for the Employer’s Personnel as stated in the Specification.

The Contractor shall not permit any of the Contractor’s Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

22.2.7 Health and Safety

The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor’s Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor’s and Employer’s Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.
The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the performance of the Contract, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.

The Contractor shall send to the Project Manager, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.

The Contractor shall throughout the contract (including the Defects Notification Period): (i) conduct Information, Education and Consultation Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and labor (including all the Contractor's employees, all Sub-Contractors and Employer’s and Project Manager’s' employees, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behavior with respect to of Sexually Transmitted Diseases (STD)—or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular; (ii) provide male or female condoms for all Site staff and labor as appropriate; and (iii) provide for STI and HIV/AIDS screening, diagnosis, counseling and referral to a dedicated national STI and HIV/AIDS program, (unless otherwise agreed) of all Site staff and labor.

The Contractor shall include in the program to be submitted for the execution of the Facilities under Sub-Clause 18.2 an alleviation program for Site staff and labor and their families in respect of Sexually Transmitted Infections (STI) and Sexually Transmitted Diseases (STD) including HIV/AIDS. The STI, STD and HIV/AIDS alleviation program shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Sub-Clause and the related specification. For each component, the program shall detail the resources to be provided or utilized and any related sub-contracting proposed. The program shall also include provision of a detailed cost estimate with supporting documentation.
Payment to the Contractor for preparation and implementation this program shall not exceed the Provisional Sum dedicated for this purpose.

22.2.8 Funeral Arrangements

In the event of the death of any of the Contractor’s personnel or accompanying members of their families, the Contractor shall be responsible for making the appropriate arrangements for their return or burial, unless otherwise specified in the PC.

22.2.9 Records of Contractor’s Personnel

The Contractor shall keep accurate records of the Contractor’s personnel, including the number of each class of Contractor’s Personnel on the Site and the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis in a form approved by the Project Manager and shall be available for inspection by the Project Manager until the Contractor has completed all work.

22.2.10 Supply of Foodstuffs

The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor’s Personnel for the purposes of or in connection with the Contract.

22.2.11 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor’s Personnel.

22.2.12 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect the Contractor’s Personnel employed on the Site from insect and pest nuisance, and to reduce their danger to health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

22.2.13 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give barter or otherwise dispose of any alcoholic liquor or drugs,
or permit or allow importation, sale, gift barter or disposal by Contractor's Personnel.

22.2.14 Arms and Ammunition

The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.

22.2.15 Prohibition of All Forms of Forced or Compulsory Labor

The contractor shall not employ “forced or compulsory labor” in any form. “Forced or compulsory labor” consists of all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.

22.2.16 Prohibition of Harmful Child Labor

The Contractor shall not employ any child to perform any work that is economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.

22.3 Contractor’s Equipment

22.3.1 All Contractor’s Equipment brought by the Contractor onto the Site shall be deemed to be intended to be used exclusively for the execution of the Contract. The Contractor shall not remove the same from the Site without the Project Manager's consent that such Contractor’s Equipment is no longer required for the execution of the Contract.

22.3.2 Unless otherwise specified in the Contract, upon completion of the Facilities, the Contractor shall remove from the Site all Equipment brought by the Contractor onto the Site and any surplus materials remaining thereon.

22.3.3 The Employer will, if requested, use its best endeavors to assist the Contractor in obtaining any local, state or national government permission required by the Contractor for the export of the Contractor’s Equipment imported by the Contractor for use in the execution of the Contract that is no longer required for the execution of the Contract.

22.4 Site Regulations and Safety
The Employer and the Contractor shall establish Site regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. The Contractor shall prepare and submit to the Employer, with a copy to the Project Manager, proposed Site regulations for the Employer’s approval, which approval shall not be unreasonably withheld.

Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the Facilities, gate control, sanitation, medical care, and fire prevention.

22.5 Opportunities for Other Contractors

22.5.1 The Contractor shall, upon written request from the Employer or the Project Manager, give all reasonable opportunities for carrying out the work to any other contractors employed by the Employer on or near the Site.

22.5.2 If the Contractor, upon written request from the Employer or the Project Manager, makes available to other contractors any roads or ways the maintenance for which the Contractor is responsible, permits the use by such other contractors of the Contractor’s Equipment, or provides any other service of whatsoever nature for such other contractors, the Employer shall fully compensate the Contractor for any loss or damage caused or occasioned by such other contractors in respect of any such use or service, and shall pay to the Contractor reasonable remuneration for the use of such equipment or the provision of such services.

22.5.3 The Contractor shall also so arrange to perform its work as to minimize, to the extent possible, interference with the work of other contractors. The Project Manager shall determine the resolution of any difference or conflict that may arise between the Contractor and other contractors and the workers of the Employer in regard to their work.

22.5.4 The Contractor shall notify the Project Manager promptly of any defects in the other contractors’ work that come to its notice, and that could affect the Contractor’s work. The Project Manager shall determine the corrective measures, if any, required to rectify the situation after inspection of the Facilities. Decisions made by the Project Manager shall be binding on the Contractor.
22.6 Emergency Work

If, by reason of an emergency arising in connection with and during the execution of the Contract, any protective or remedial work is necessary as a matter of urgency to prevent damage to the Facilities, the Contractor shall immediately carry out such work.

If the Contractor is unable or unwilling to do such work immediately, the Employer may do or cause such work to be done as the Employer may determine is necessary in order to prevent damage to the Facilities. In such event the Employer shall, as soon as practicable after the occurrence of any such emergency, notify the Contractor in writing of such emergency, the work done and the reasons therefor. If the work done or caused to be done by the Employer is work that the Contractor was liable to do at its own expense under the Contract, the reasonable costs incurred by the Employer in connection therewith shall be paid by the Contractor to the Employer. Otherwise, the cost of such remedial work shall be borne by the Employer.

22.7 Site Clearance

22.7.1 Site Clearance in Course of Performance: In the course of carrying out the Contract, the Contractor shall keep the Site reasonably free from all unnecessary obstruction, store or remove any surplus materials, clear away any wreckage, rubbish or temporary works from the Site, and remove any Contractor’s Equipment no longer required for execution of the Contract.

22.7.2 Clearance of Site after Completion: After Completion of all parts of the Facilities, the Contractor shall clear away and remove all wreckage, rubbish and debris of any kind from the Site, and shall leave the Site and Facilities in a clean and safe condition.

22.8 Watching and Lighting

The Contractor shall provide and maintain at its own expense all lighting, fencing, and watching when and where necessary for the proper execution and the protection of the Facilities, or for the safety of the owners and occupiers of adjacent property and for the safety of the public.

23. Test and Inspection

23.1 The Contractor shall at its own expense carry out at the place of manufacture and/or on the Site all such tests and/or inspections of the Plant and any part of the Facilities as are specified in the Contract.
23.2 The Employer and the Project Manager or their designated representatives shall be entitled to attend the aforesaid test and/or inspection, provided that the Employer shall bear all costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

23.3 Whenever the Contractor is ready to carry out any such test and/or inspection, the Contractor shall give a reasonable advance notice of such test and/or inspection and of the place and time thereof to the Project Manager. The Contractor shall obtain from any relevant third Party or manufacturer any necessary permission or consent to enable the Employer and the Project Manager or their designated representatives to attend the test and/or inspection.

23.4 The Contractor shall provide the Project Manager with a certified report of the results of any such test and/or inspection.

If the Employer or Project Manager or their designated representatives fails to attend the test and/or inspection, or if it is agreed between the Parties that such persons shall not do so, then the Contractor may proceed with the test and/or inspection in the absence of such persons, and may provide the Project Manager with a certified report of the results thereof.

23.5 The Project Manager may require the Contractor to carry out any test and/or inspection not required by the Contract, provided that the Contractor’s reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impede the progress of work on the Facilities and/or the Contractor’s performance of its other obligations under the Contract, due allowance will be made in respect of the Time for Completion and the other obligations so affected.

23.6 If any Plant or any part of the Facilities fails to pass any test and/or inspection, the Contractor shall either rectify or replace such Plant or part of the Facilities and shall repeat the test and/or inspection upon giving a notice under GC Sub-Clause 23.3.

23.7 If any dispute or difference of opinion shall arise between the Parties in connection with or arising out of the test and/or inspection of the Plant or part of the Facilities that cannot be settled between the Parties within a reasonable period of time, it may be referred to an Dispute Board for determination in
23.8 The Contractor shall afford the Employer and the Project Manager, at the Employer’s expense, access at any reasonable time to any place where the Plant are being manufactured or the Facilities are being installed, in order to inspect the progress and the manner of manufacture or installation, provided that the Project Manager shall give the Contractor a reasonable prior notice.

23.9 The Contractor agrees that neither the execution of a test and/or inspection of Plant or any part of the Facilities, nor the attendance by the Employer or the Project Manager, nor the issue of any test certificate pursuant to GC Sub-Clause 23.4, shall release the Contractor from any other responsibilities under the Contract.

23.10 No part of the Facilities or foundations shall be covered up on the Site without the Contractor carrying out any test and/or inspection required under the Contract. The Contractor shall give a reasonable notice to the Project Manager whenever any such parts of the Facilities or foundations are ready or about to be ready for test and/or inspection; such test and/or inspection and notice thereof shall be subject to the requirements of the Contract.

23.11 The Contractor shall uncover any part of the Facilities or foundations, or shall make openings in or through the same as the Project Manager may from time to time require at the Site, and shall reinstate and make good such part or parts.

If any parts of the Facilities or foundations have been covered up at the Site after compliance with the requirement of GC Sub-Clause 23.10 and are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating, and making good the same shall be borne by the Employer, and the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been delayed or impeded in the performance of any of its obligations under the Contract.

24. Completion of the Facilities

24.1 As soon as the Facilities or any part thereof has, in the opinion of the Contractor, been completed operationally and structurally and put in a tight and clean condition as specified in the Employer’s Requirements, excluding minor items not materially affecting the operation or safety of the Facilities, the Contractor shall so notify the Employer in writing.

24.2 Within seven (7) days after receipt of the notice from the Contractor under GC Sub-Clause 24.1, the Employer shall supply the operating and maintenance personnel specified in
the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer for Pre-commissioning of the Facilities or any part thereof.

Pursuant to the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, the Employer shall also provide, within the said seven (7) day period, the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters required for Pre-commissioning of the Facilities or any part thereof.

24.3 As soon as reasonably practicable after the operating and maintenance personnel have been supplied by the Employer and the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters have been provided by the Employer in accordance with GC Sub-Clause 24.2, the Contractor shall commence Pre-commissioning of the Facilities or the relevant part thereof in preparation for Commissioning, subject to GC Sub-Clause 25.5.

24.4 As soon as all works in respect of Pre-commissioning are completed and, in the opinion of the Contractor, the Facilities or any part thereof is ready for Commissioning, the Contractor shall so notify the Project Manager in writing.

24.5 The Project Manager shall, within fourteen (14) days after receipt of the Contractor’s notice under GC Sub-Clause 24.4, either issue a Completion Certificate in the form specified in the Employer’s Requirements (Forms and Procedures), stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor’s notice under GC Sub-Clause 24.4, or notify the Contractor in writing of any defects and/or deficiencies.

If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in GC Sub-Clause 24.4.

If the Project Manager is satisfied that the Facilities or that part thereof have reached Completion, the Project Manager shall, within seven (7) days after receipt of the Contractor’s repeated notice, issue a Completion Certificate stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor’s repeated notice.

If the Project Manager is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within seven (7) days after receipt of the Contractor’s repeated notice, and the above procedure shall be repeated.
24.6 If the Project Manager fails to issue the Completion Certificate and fails to inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor’s notice under GC Sub-Clause 24.4 or within seven (7) days after receipt of the Contractor’s repeated notice under GC Sub-Clause 24.5, or if the Employer makes use of the Facilities or part thereof, then the Facilities or that part thereof shall be deemed to have reached Completion as of the date of the Contractor’s notice or repeated notice, or as of the Employer’s use of the Facilities, as the case may be.

24.7 As soon as possible after Completion, the Contractor shall complete all outstanding minor items so that the Facilities are fully in accordance with the requirements of the Contract, failing which the Employer will undertake such completion and deduct the costs thereof from any monies owing to the Contractor.

24.8 Upon Completion, the Employer shall be responsible for the care and custody of the Facilities or the relevant part thereof, together with the risk of loss or damage thereto, and shall thereafter take over the Facilities or the relevant part thereof.

25. Commissioning and Operational Acceptance

25.1 Commissioning

25.1.1 Commissioning of the Facilities or any part thereof shall be commenced by the Contractor immediately after issue of the Completion Certificate by the Project Manager, pursuant to GC Sub-Clause 24.5, or immediately after the date of the deemed Completion, under GC Sub-Clause 24.6.

25.1.2 The Employer shall supply the operating and maintenance personnel and all raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters required for Commissioning.

25.1.3 In accordance with the requirements of the Contract, the Contractor’s and Project Manager’s advisory personnel shall attend the Commissioning, including the Guarantee Test, and shall advise and assist the Employer.

25.2 Guarantee Test

25.2.1 Subject to GC Sub-Clause 25.5, the Guarantee Test and repeats thereof shall be conducted by the Contractor during Commissioning of the Facilities or the relevant part thereof to ascertain whether the Facilities or the relevant part can attain the Functional Guarantees specified in the Appendix to the Contract.
Agreement titled Functional Guarantees. The Employer shall promptly provide the Contractor with such information as the Contractor may reasonably require in relation to the conduct and results of the Guarantee Test and any repeats thereof.

25.2.2 If for reasons not attributable to the Contractor, the Guarantee Test of the Facilities or the relevant part thereof cannot be successfully completed within the period from the date of Completion specified in the PC or any other period agreed upon by the Employer and the Contractor, the Contractor shall be deemed to have fulfilled its obligations with respect to the Functional Guarantees, and GC Sub-Clauses 28.2 and 28.3 shall not apply.

25.3 Operational Acceptance

25.3.1 Subject to GC Sub-Clause 25.4 below, Operational Acceptance shall occur in respect of the Facilities or any part thereof when

(a) the Guarantee Test has been successfully completed and the Functional Guarantees are met; or

(b) the Guarantee Test has not been successfully completed or has not been carried out for reasons not attributable to the Contractor within the period from the date of Completion specified in the PC pursuant to GC Sub-Clause 25.2.2 above or any other period agreed upon by the Employer and the Contractor; or

(c) the Contractor has paid the liquidated damages specified in GC Sub-Clause 28.3 hereof; and

(d) any minor items mentioned in GC Sub-Clause 24.7 hereof relevant to the Facilities or that part thereof have been completed.

25.3.2 At any time after any of the events set out in GC Sub-Clause 25.3.1 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate in the form provided in the Employer’s Requirements (Forms and Procedures) in respect of the Facilities or the part thereof specified in such notice as of the date of such notice.

25.3.3 The Project Manager shall, after consultation with the Employer, and within seven (7) days after receipt of the Contractor’s notice, issue an Operational
25.3.4 If within seven (7) days after receipt of the Contractor’s notice, the Project Manager fails to issue the Operational Acceptance Certificate or fails to inform the Contractor in writing of the justifiable reasons why the Project Manager has not issued the Operational Acceptance Certificate, the Facilities or the relevant part thereof shall be deemed to have been accepted as of the date of the Contractor’s said notice.

25.4 Partial Acceptance

25.4.1 If the Contract specifies that Completion and Commissioning shall be carried out in respect of parts of the Facilities, the provisions relating to Completion and Commissioning including the Guarantee Test shall apply to each such part of the Facilities individually, and the Operational Acceptance Certificate shall be issued accordingly for each such part of the Facilities.

25.4.2 If a part of the Facilities comprises facilities such as buildings, for which no Commissioning or Guarantee Test is required, then the Project Manager shall issue the Operational Acceptance Certificate for such facility when it attains Completion, provided that the Contractor shall thereafter complete any outstanding minor items that are listed in the Operational Acceptance Certificate.

25.5 Delayed Pre-commissioning and/or Guarantee Test

25.5.1 In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to Sub-Clause 24.3, or with the Guarantee Test pursuant to Sub-Clause 25.2, for reasons attributable to the Employer either on account of non availability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Contractor’s control, the provisions leading to “deemed” completion of activities such as Completion, pursuant to GC Sub-Clause 24.6, and Operational Acceptance, pursuant to GC Sub-Clause 25.3.4, and Contractor’s obligations regarding Defect Liability Period, pursuant to GC Sub-Clause 27.2, Functional Guarantee, pursuant to GC Clause 28, and Care of Facilities, pursuant to GC Clause 32, and GC Clause 41.1, Suspension, shall not apply. In this case, the following provisions shall apply.

25.5.2 When the Contractor is notified by the Project
Manager that he will be unable to proceed with the activities and obligations pursuant to above Sub-Clause 13.1, the Contractor shall be entitled to the following:

(a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to GC Sub-Clause 26.2;

(b) payments due to the Contractor in accordance with the provision specified in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, which would not have been payable in normal circumstances due to non-completion of the subject activities, shall be released to the Contractor against submission of a security in the form of a bank guarantee of equivalent amount acceptable to the Employer, and which shall become null and void when the Contractor will have complied with its obligations regarding those payments, subject to the provision of Sub-Clause 25.5.3 below;

(c) the expenses towards the above security and extension of other securities under the contract, of which validity needs to be extended, shall be reimbursed to the Contractor by the Employer;

(d) the additional charges towards the care of the Facilities pursuant to GC Sub-Clause 32.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in Sub-Clause 25.5.4 below. The provision of GC Sub-Clause 33.2 shall apply to the Facilities during the same period.

25.5.3 In the event that the period of suspension under above Sub-Clause 25.5.1 actually exceeds one hundred eighty (180) days, the Employer and Contractor shall mutually agree to any additional compensation payable to the Contractor.

25.5.4 When the Contractor is notified by the Project Manager that the plant is ready for Pre-commissioning, the Contractor shall proceed without delay in performing Pre-commissioning in accordance with Clause 24.
Guarantees and Liabilities

26. Completion Time Guarantee

26.1 The Contractor guarantees that it shall attain Completion of the Facilities (or a part for which a separate time for completion is specified) within the Time for Completion specified in the PC pursuant to GC Sub-Clause 8.2, or within such extended time to which the Contractor shall be entitled under GC Clause 40 hereof.

26.2 If the Contractor fails to attain Completion of the Facilities or any part thereof within the Time for Completion or any extension thereof under GC Clause 40, the Contractor shall pay to the Employer liquidated damages in the amount specified in the PC as a percentage rate of the Contract Price or the relevant part thereof. The aggregate amount of such liquidated damages shall in no event exceed the amount specified as “Maximum” in the PC as a percentage rate of the Contract Price. Once the “Maximum” is reached, the Employer may consider termination of the Contract, pursuant to GC Sub-Clause 42.2.2.

Such payment shall completely satisfy the Contractor’s obligation to attain Completion of the Facilities or the relevant part thereof within the Time for Completion or any extension thereof under GC Clause 40. The Contractor shall have no further liability whatsoever to the Employer in respect thereof.

However, the payment of liquidated damages shall not in any way relieve the Contractor from any of its obligations to complete the Facilities or from any other obligations and liabilities of the Contractor under the Contract.

Save for liquidated damages payable under this GC Sub-Clause 26.2, the failure by the Contractor to attain any milestone or other act, matter or thing by any date specified in the Appendix to the Contract Agreement titled Time Schedule, and/or other program of work prepared pursuant to GC Sub-Clause 18.2 shall not render the Contractor liable for any loss or damage thereby suffered by the Employer.

26.3 If the Contractor attains Completion of the Facilities or any part thereof before the Time for Completion or any extension thereof under GC Clause 40, the Employer shall pay to the Contractor a bonus in the amount specified in the PC. The aggregate amount of such bonus shall in no event exceed the amount specified as “Maximum” in the PC.

27. Defect Liability

27.1 The Contractor warrants that the Facilities or any part thereof shall be free from defects in the design, engineering, materials and workmanship of the Plant supplied and of the work executed.
27.2 The Defect Liability Period shall be five hundred and forty (540) days from the date of Completion of the Facilities (or any part thereof) or one year from the date of Operational Acceptance of the Facilities (or any part thereof), whichever first occurs, unless specified otherwise in the PC pursuant to GC Sub-Clause 27.10.

If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant supplied or of the work executed by the Contractor, the Contractor shall promptly, in consultation and agreement with the Employer regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good as the Contractor shall determine at its discretion, such defect as well as any damage to the Facilities caused by such defect. The Contractor shall not be responsible for the repair, replacement or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes:

(a) improper operation or maintenance of the Facilities by the Employer;

(b) operation of the Facilities outside specifications provided in the Contract; or

(c) normal wear and tear.

27.3 The Contractor’s obligations under this GC Clause 27 shall not apply to:

(a) any materials that are supplied by the Employer under GC Sub-Clause 21.2, are normally consumed in operation, or have a normal life shorter than the Defect Liability Period stated herein;

(b) any designs, specifications or other data designed, supplied or specified by or on behalf of the Employer or any matters for which the Contractor has disclaimed responsibility herein; or

(c) any other materials supplied or any other work executed by or on behalf of the Employer, except for the work executed by the Employer under GC Sub-Clause 27.7.

27.4 The Employer shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. The Employer shall afford all reasonable opportunity for the Contractor to inspect any such defect.

27.5 The Employer shall afford the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its
obligations under this GC Clause 27.

The Contractor may, with the consent of the Employer, remove from the Site any Plant or any part of the Facilities that are defective if the nature of the defect, and/or any damage to the Facilities caused by the defect, is such that repairs cannot be expeditiously carried out at the Site.

27.6 If the repair, replacement or making good is of such a character that it may affect the efficiency of the Facilities or any part thereof, the Employer may give to the Contractor a notice requiring that tests of the defective part of the Facilities shall be made by the Contractor immediately upon completion of such remedial work, whereupon the Contractor shall carry out such tests.

If such part fails the tests, the Contractor shall carry out further repair, replacement or making good, as the case may be, until that part of the Facilities passes such tests. The tests shall be agreed upon by the Employer and the Contractor.

27.7 If the Contractor fails to commence the work necessary to remedy such defect or any damage to the Facilities caused by such defect within a reasonable time (which shall in no event be considered to be less than fifteen (15) days), the Employer may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by the Employer in connection therewith shall be paid to the Employer by the Contractor or may be deducted by the Employer from any monies due the Contractor or claimed under the Performance Security.

27.8 If the Facilities or any part thereof cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Employer because of any of the aforesaid reasons.

27.9 Except as provided in GC Clauses 27 and 33, the Contractor shall be under no liability whatsoever and howsoever arising, and whether under the Contract or at law, in respect of defects in the Facilities or any part thereof, the Plant, design or engineering or work executed that appear after Completion of the Facilities or any part thereof, except where such defects are the result of the gross negligence, fraud, or criminal or willful action of the Contractor.

27.10 In addition, any such component of the Facilities, and during the period of time as may be specified in the PC, shall be subject to an extended defect liability period. Such obligation of the Contractor shall be in addition to the defect liability period
specified under GC Sub-Clause 27.2.

28. Functional Guarantees

28.1 The Contractor guarantees that during the Guarantee Test, the Facilities and all parts thereof shall attain the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, subject to and upon the conditions therein specified.

28.2 If, for reasons attributable to the Contractor, the minimum level of the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, are not met either in whole or in part, the Contractor shall at its cost and expense make such changes, modifications and/or additions to the Plant or any part thereof as may be necessary to meet at least the minimum level of such Guarantees. The Contractor shall notify the Employer upon completion of the necessary changes, modifications and/or additions, and shall request the Employer to repeat the Guarantee Test until the minimum level of the Guarantees has been met. If the Contractor eventually fails to meet the minimum level of Functional Guarantees, the Employer may consider termination of the Contract, pursuant to GC Sub-Clause 42.2.2.

28.3 If, for reasons attributable to the Contractor, the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, are not attained either in whole or in part, but the minimum level of the Functional Guarantees specified in the said Appendix to the Contract Agreement is met, the Contractor shall, at the Contractor’s option, either

(a) make such changes, modifications and/or additions to the Facilities or any part thereof that are necessary to attain the Functional Guarantees at its cost and expense, and shall request the Employer to repeat the Guarantee Test or

(b) pay liquidated damages to the Employer in respect of the failure to meet the Functional Guarantees in accordance with the provisions in the Appendix to the Contract Agreement titled Functional Guarantees.

28.4 The payment of liquidated damages under GC Sub-Clause 28.3, up to the limitation of liability specified in the Appendix to the Contract Agreement titled Functional Guarantees, shall completely satisfy the Contractor’s guarantees under GC Sub-Clause 28.3, and the Contractor shall have no further liability whatsoever to the Employer in respect thereof. Upon the payment of such liquidated damages by the Contractor, the Project Manager shall issue the Operational Acceptance Certificate for the Facilities or any part thereof in respect of which the liquidated damages have been so paid.
29. **Patent Indemnity**

29.1 The Contractor shall, subject to the Employer’s compliance with GC Sub-Clause 29.2, indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney’s fees and expenses, which the Employer may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract by reason of: (a) the installation of the Facilities by the Contractor or the use of the Facilities in the country where the Site is located; and (b) the sale of the products produced by the Facilities in any country.

Such indemnity shall not cover any use of the Facilities or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, any infringement resulting from the use of the Facilities or any part thereof, or any products produced thereby in association or combination with any other equipment, plant or materials not supplied by the Contractor, pursuant to the Contract Agreement.

29.2 If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in GC Sub-Clause 29.1, the Employer shall promptly give the Contractor a notice thereof, and the Contractor may at its own expense and in the Employer’s name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

The Employer shall, at the Contractor’s request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.

29.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers and Subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney’s fees and expenses, which the Contractor may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract.
arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Employer.

30. Limitation of Liability

30.1 Except in cases of criminal negligence or willful misconduct,

(a) neither Party shall be liable to the other Party, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, which may be suffered by the other Party in connection with the Contract, other than specifically provided as any obligation of the Party in the Contract, and

(b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the amount resulting from the application of the multiplier specified in the PC, to the Contract Price or, if a multiplier is not so specified, the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.

Risk Distribution

31. Transfer of Ownership

31.1 Ownership of the Plant (including spare parts) to be imported into the country where the Site is located shall be transferred to the Employer upon loading on to the mode of transport to be used to convey the Plant from the country of origin to that country.

31.2 Ownership of the Plant (including spare parts) procured in the country where the Site is located shall be transferred to the Employer when the Plant are brought on to the Site.

31.3 Ownership of the Contractor’s Equipment used by the Contractor and its Subcontractors in connection with the Contract shall remain with the Contractor or its Subcontractors.

31.4 Ownership of any Plant in excess of the requirements for the Facilities shall revert to the Contractor upon Completion of the Facilities or at such earlier time when the Employer and the Contractor agree that the Plant in question are no longer required for the Facilities.

31.5 Notwithstanding the transfer of ownership of the Plant, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor pursuant to GC Clause 32 (Care of Facilities) hereof until
Completion of the Facilities or the part thereof in which such Plant are incorporated.

32. Care of Facilities

32.1 The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Completion of the Facilities pursuant to GC Clause 24 or, where the Contract provides for Completion of the Facilities in parts, until the date of Completion of the relevant part, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its Subcontractors in the course of any work carried out, pursuant to GC Clause 27. Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by reason of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GC Sub-Claususes 32.2 and 38.1.

32.2 If any loss or damage occurs to the Facilities or any part thereof or to the Contractor’s temporary facilities by reason of

(a) insofar as they relate to the country where the Site is located, nuclear reaction, nuclear radiation, radioactive contamination, pressure wave caused by aircraft or other aerial objects, or any other occurrences that an experienced contractor could not reasonably foresee, or if reasonably foreseeable could not reasonably make provision for or insure against, insofar as such risks are not normally insurable on the insurance market and are mentioned in the general exclusions of the policy of insurance, including War Risks and Political Risks, taken out under GC Clause 34 hereof; or

(b) any use or occupation by the Employer or any third Party other than a Subcontractor, authorized by the Employer of any part of the Facilities; or

(c) any use of or reliance upon any design, data or specification provided or designated by or on behalf of the Employer, or any such matter for which the Contractor has disclaimed responsibility herein,

the Employer shall pay to the Contractor all sums payable in respect of the Facilities executed, notwithstanding that the same be lost, destroyed or damaged, and will pay to the Contractor the replacement value of all temporary facilities and all parts thereof lost, destroyed or damaged. If the Employer requests the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Contractor shall make good the same at the cost of the Employer in accordance with GC Clause 39. If the Employer does not request the Contractor in
writing to make good any loss or damage to the Facilities thereby occasioned, the Employer shall either request a change in accordance with GC Clause 39, excluding the performance of that part of the Facilities thereby lost, destroyed or damaged, or, where the loss or damage affects a substantial part of the Facilities, the Employer shall terminate the Contract pursuant to GC Sub-Clause 42.1 hereof.

32.3 The Contractor shall be liable for any loss of or damage to any Contractor’s Equipment, or any other property of the Contractor used or intended to be used for purposes of the Facilities, except (i) as mentioned in GC Sub-Clause 32.2 with respect to the Contractor’s temporary facilities, and (ii) where such loss or damage arises by reason of any of the matters specified in GC Sub-Clauses 32.2 (b) and (c) and 38.1.

32.4 With respect to any loss or damage caused to the Facilities or any part thereof or to the Contractor’s Equipment by reason of any of the matters specified in GC Sub-Clause 38.1, the provisions of GC Sub-Clause 38.3 shall apply.

33. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification

33.1 Subject to GC Sub-Clause 33.3, the Contractor shall indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney’s fees and expenses, in respect of the death or injury of any person or loss of or damage to any property other than the Facilities whether accepted or not, arising in connection with the supply and installation of the Facilities and by reason of the negligence of the Contractor or its Subcontractors, or their employees, officers or agents, except any injury, death or property damage caused by the negligence of the Employer, its contractors, employees, officers or agents.

33.2 If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GC Sub-Clause 33.1, the Employer shall promptly give the Contractor a notice thereof and the Contractor may at its own expense and in the Employer’s name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.
The Employer shall, at the Contractor’s request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.

33.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers and Subcontractors from any liability for loss of or damage to property of the Employer, other than the Facilities not yet taken over, that is caused by fire, explosion or any other perils, in excess of the amount recoverable from insurances procured under GC Clause 34, provided that such fire, explosion or other perils were not caused by any act or failure of the Contractor.

33.4 The Party entitled to the benefit of an indemnity under this GC Clause 33 shall take all reasonable measures to mitigate any loss or damage which has occurred. If the Party fails to take such measures, the other Party’s liabilities shall be correspondingly reduced.

34. Insurance

34.1 To the extent specified in the Appendix to the Contract Agreement titled Insurance Requirements, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified in the said Appendix. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, who should not unreasonably withhold such approval.

(a) Cargo Insurance During Transport

Covering loss or damage occurring while in transit from the Contractor’s or Subcontractor’s works or stores until arrival at the Site, to the Plant (including spare parts therefor) and to the Contractor’s Equipment.

(b) Installation All Risks Insurance

Covering physical loss or damage to the Facilities at the Site, occurring prior to Completion of the Facilities, with an extended maintenance coverage for the Contractor’s liability in respect of any loss or damage occurring during the Defect Liability Period while the Contractor is on the Site for the purpose of performing its obligations during the Defect Liability Period.

(c) Third Party Liability Insurance

Covering bodily injury or death suffered by third Parties including the Employer’s personnel, and loss of or damage to property occurring in connection with the supply and
installation of the Facilities.

(d) **Automobile Liability Insurance**

Covering use of all vehicles used by the Contractor or its Subcontractors, whether or not owned by them, in connection with the execution of the Contract.

(e) **Workers’ Compensation**

In accordance with the statutory requirements applicable in any country where the Contract or any part thereof is executed.

(f) **Employer’s Liability**

In accordance with the statutory requirements applicable in any country where the Contract or any part thereof is executed.

(g) **Other Insurances**

Such other insurances as may be specifically agreed upon by the Parties hereto as listed in the Appendix to the Contract Agreement titled Insurance Requirements.

34.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 34.1, except for the Third Party Liability, Workers’ Compensation and Employer’s Liability Insurances, and the Contractor’s Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 34.1 except for the Cargo Insurance During Transport, Workers’ Compensation and Employer’s Liability Insurances. All insurer’s rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

34.3 The Contractor shall, in accordance with the provisions of the Appendix to the Contract Agreement titled Insurance Requirements, deliver to the Employer certificates of insurance or copies of the insurance policies as evidence that the required policies are in full force and effect. The certificates shall provide that no less than twenty-one (21) days’ notice shall be given to the Employer by insurers prior to cancellation or material modification of a policy.

34.4 The Contractor shall ensure that, where applicable, its Subcontractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and vehicles and for work executed by them under the Contract, unless such Subcontractors are covered by the policies taken out by the Contractor.
34.5 The Employer shall at its expense take out and maintain in effect during the performance of the Contract those insurances specified in the Appendix to the Contract Agreement titled Insurance Requirements, in the sums and with the deductibles and other conditions specified in the said Appendix. The Contractor and the Contractor’s Subcontractors shall be named as co-insureds under all such policies. All insurers’ rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies. The Employer shall deliver to the Contractor satisfactory evidence that the required insurances are in full force and effect. The policies shall provide that not less than twenty-one (21) days’ notice shall be given to the Contractor by all insurers prior to any cancellation or material modification of the policies. If so requested by the Contractor, the Employer shall provide copies of the policies taken out by the Employer under this GC Sub-Clause 34.5.

34.6 If the Contractor fails to take out and/or maintain in effect the insurances referred to in GC Sub-Clause 34.1, the Employer may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Contractor under the Contract any premium that the Employer shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor. If the Employer fails to take out and/or maintain in effect the insurances referred to in GC 34.5, the Contractor may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Employer under the Contract any premium that the Contractor shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Employer. If the Contractor fails to or is unable to take out and maintain in effect any such insurances, the Contractor shall nevertheless have no liability or responsibility towards the Employer, and the Contractor shall have full recourse against the Employer for any and all liabilities of the Employer herein.

34.7 Unless otherwise provided in the Contract, the Contractor shall prepare and conduct all and any claims made under the policies effected by it pursuant to this GC Clause 34, and all monies payable by any insurers shall be paid to the Contractor. The Employer shall give to the Contractor all such reasonable assistance as may be required by the Contractor. With respect to insurance claims in which the Employer’s interest is involved, the Contractor shall not give any release or make any compromise with the insurer without the prior written consent of the Employer. With respect to insurance claims in which the Contractor’s interest is involved, the Employer shall not give any release or make any compromise with the insurer without
the prior written consent of the Contractor.

35. Unforeseen Conditions

35.1 If, during the execution of the Contract, the Contractor shall encounter on the Site any physical conditions other than climatic conditions, or artificial obstructions that could not have been reasonably foreseen prior to the date of the Contract Agreement by an experienced contractor on the basis of reasonable examination of the data relating to the Facilities including any data as to boring tests, provided by the Employer, and on the basis of information that it could have obtained from a visual inspection of the Site if access thereto was available, or other data readily available to it relating to the Facilities, and if the Contractor determines that it will in consequence of such conditions or obstructions incur additional cost and expense or require additional time to perform its obligations under the Contract that would not have been required if such physical conditions or artificial obstructions had not been encountered, the Contractor shall promptly, and before performing additional work or using additional Plant or Contractor’s Equipment, notify the Project Manager in writing of

(a) the physical conditions or artificial obstructions on the Site that could not have been reasonably foreseen;

(b) the additional work and/or Plant and/or Contractor’s Equipment required, including the steps which the Contractor will or proposes to take to overcome such conditions or obstructions;

(c) the extent of the anticipated delay; and

(d) the additional cost and expense that the Contractor is likely to incur.

On receiving any notice from the Contractor under this GC Sub-Clause 35.1, the Project Manager shall promptly consult with the Employer and Contractor and decide upon the actions to be taken to overcome the physical conditions or artificial obstructions encountered. Following such consultations, the Project Manager shall instruct the Contractor, with a copy to the Employer, of the actions to be taken.

35.2 Any reasonable additional cost and expense incurred by the Contractor in following the instructions from the Project Manager to overcome such physical conditions or artificial obstructions referred to in GC Sub-Clause 35.1 shall be paid by the Employer to the Contractor as an addition to the Contract Price.

If the Contractor is delayed or impeded in the performance of the
Contract because of any such physical conditions or artificial obstructions referred to in GC Sub-Clause 35.1, the Time for Completion shall be extended in accordance with GC Clause 40.

36. Change in Laws and Regulations

36.1 If, after the date twenty-eight (28) days prior to the date of Bid submission, in the country where the Site is located, any law, regulation, ordinance, order or by-law having the force of law is enacted, promulgated, abrogated or changed which shall be deemed to include any change in interpretation or application by the competent authorities, that subsequently affects the costs and expenses of the Contractor and/or the Time for Completion, the Contract Price shall be correspondingly increased or decreased, and/or the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract. Notwithstanding the foregoing, such additional or reduced costs shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with the PC pursuant to GC Sub-Clause 11.2.

37. Force Majeure

37.1 “Force Majeure” shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the Party affected, and shall include, without limitation, the following:

(a) war, hostilities or warlike operations whether a state of war be declared or not, invasion, act of foreign enemy and civil war

(b) rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion and terrorist acts

(c) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler or any other act or failure to act of any local state or national government authority

(d) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine and plague

(e) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or other inclement weather condition, nuclear and pressure waves or other natural or physical
disaster

(f) shortage of labor, materials or utilities where caused by circumstances that are themselves Force Majeure.

37.2 If either Party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.

37.3 The Party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such Party’s performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with GC Clause 40.

37.4 The Party or Parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect thereof upon its or their performance of the Contract and to fulfill its or their obligations under the Contract, but without prejudice to either Party’s right to terminate the Contract under GC Sub-Clauses 37.6 and 38.5.

37.5 No delay or nonperformance by either Party hereto caused by the occurrence of any event of Force Majeure shall

(a) constitute a default or breach of the Contract, or

(b) give rise to any claim for damages or additional cost or expense occasioned thereby, subject to GC Sub-Clauses 32.2, 38.3 and 38.4

if and to the extent that such delay or nonperformance is caused by the occurrence of an event of Force Majeure.

37.6 If the performance of the Contract is substantially prevented, hindered or delayed for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of one or more events of Force Majeure during the currency of the Contract, the Parties will attempt to develop a mutually satisfactory solution, failing which either Party may terminate the Contract by giving a notice to the other, but without prejudice to either Party’s right to terminate the Contract under GC Sub-Clause 38.5.

37.7 In the event of termination pursuant to GC Sub-Clause 37.6, the rights and obligations of the Employer and the Contractor shall be as specified in GC Sub-Clauses 42.1.2 and 42.1.3.

37.8 Notwithstanding GC Sub-Clause 37.5, Force Majeure shall not
apply to any obligation of the Employer to make payments to the Contractor herein.

38. War Risks

38.1 “War Risks” shall mean any event specified in paragraphs (a) and (b) of GC Sub-Clause 37.1 and any explosion or impact of any mine, bomb, shell, grenade or other projectile, missile, munitions or explosive of war, occurring or existing in or near the country (or countries) where the Site is located.

38.2 Notwithstanding anything contained in the Contract, the Contractor shall have no liability whatsoever for or with respect to

(a) destruction of or damage to Facilities, Plant, or any part thereof;

(b) destruction of or damage to property of the Employer or any third Party; or

(c) injury or loss of life

if such destruction, damage, injury or loss of life is caused by any War Risks, and the Employer shall indemnify and hold the Contractor harmless from and against any and all claims, liabilities, actions, lawsuits, damages, costs, charges or expenses arising in consequence of or in connection with the same.

38.3 If the Facilities or any Plant or Contractor’s Equipment or any other property of the Contractor used or intended to be used for the purposes of the Facilities shall sustain destruction or damage by reason of any War Risks, the Employer shall pay the Contractor for

(a) any part of the Facilities or the Plant so destroyed or damaged to the extent not already paid for by the Employer

and so far as may be required by the Employer, and as may be necessary for completion of the Facilities

(b) replacing or making good any Contractor’s Equipment or other property of the Contractor so destroyed or damaged

(c) replacing or making good any such destruction or damage to the Facilities or the Plant or any part thereof.

If the Employer does not require the Contractor to replace or make good any such destruction or damage to the Facilities, the Employer shall either request a change in accordance with GC Clause 39, excluding the performance of that part of the Facilities thereby destroyed or damaged or, where the loss, destruction or damage affects a substantial part of the Facilities, shall terminate the Contract, pursuant to GC Sub-Clause 42.1.
If the Employer requires the Contractor to replace or make good on any such destruction or damage to the Facilities, the Time for Completion shall be extended in accordance with GC 40.

38.4 Notwithstanding anything contained in the Contract, the Employer shall pay the Contractor for any increased costs or incidentals to the execution of the Contract that are in any way attributable to, consequent on, resulting from, or in any way connected with any War Risks, provided that the Contractor shall as soon as practicable notify the Employer in writing of any such increased cost.

38.5 If during the performance of the Contract any War Risks shall occur that financially or otherwise materially affect the execution of the Contract by the Contractor, the Contractor shall use its reasonable efforts to execute the Contract with due and proper consideration given to the safety of its and its Subcontractors’ personnel engaged in the work on the Facilities, provided, however, that if the execution of the work on the Facilities becomes impossible or is substantially prevented for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of any War Risks, the Parties will attempt to develop a mutually satisfactory solution, failing which either Party may terminate the Contract by giving a notice to the other.

38.6 In the event of termination pursuant to GC Sub-Clauses 38.3 or 38.5, the rights and obligations of the Employer and the Contractor shall be specified in GC Sub-Clauses 42.1.2 and 42.1.3.

**Change in Contract Elements**

### 39. Change in the Facilities

#### 39.1 Introducing a Change

39.1.1 Subject to GC Sub-Clauses 39.2.5 and 39.2.7, the Employer shall have the right to propose, and subsequently require, that the Project Manager order the Contractor from time to time during the performance of the Contract to make any change, modification, addition or deletion to, in or from the Facilities hereinafter called “Change”, provided that such Change falls within the general scope of the Facilities and does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Facilities and the technical compatibility of the Change envisaged with the nature of the Facilities as specified in the Contract.

39.1.2 The Contractor may from time to time during its performance of the Contract propose to the Employer with
a copy to the Project Manager, any Change that the Contractor considers necessary or desirable to improve the quality, efficiency or safety of the Facilities. The Employer may at its discretion approve or reject any Change proposed by the Contractor, provided that the Employer shall approve any Change proposed by the Contractor to ensure the safety of the Facilities.

39.1.3 Notwithstanding GC Sub-Clauses 39.1.1 and 39.1.2, no change made necessary because of any default of the Contractor in the performance of its obligations under the Contract shall be deemed to be a Change, and such change shall not result in any adjustment of the Contract Price or the Time for Completion.

39.1.4 The procedure on how to proceed with and execute Changes is specified in GC Sub-Clauses 39.2 and 39.3, and further details and forms are provided in the Employer’s Requirements (Forms and Procedures).

39.2 Changes Originating from Employer

39.2.1 If the Employer proposes a Change pursuant to GC Sub-Clause 39.1.1, it shall send to the Contractor a “Request for Change Proposal,” requiring the Contractor to prepare and furnish to the Project Manager as soon as reasonably practicable a “Change Proposal,” which shall include the following:

(a) brief description of the Change
(b) effect on the Time for Completion
(c) estimated cost of the Change
(d) effect on Functional Guarantees (if any)
(e) effect on the Facilities
(f) effect on any other provisions of the Contract.

39.2.2 Prior to preparing and submitting the “Change Proposal,” the Contractor shall submit to the Project Manager an “Estimate for Change Proposal,” which shall be an estimate of the cost of preparing and submitting the Change Proposal.

Upon receipt of the Contractor’s Estimate for Change Proposal, the Employer shall do one of the following:

(a) accept the Contractor’s estimate with instructions to the Contractor to proceed with the preparation
of the Change Proposal

(b) advise the Contractor of any part of its Estimate for Change Proposal that is unacceptable and request the Contractor to review its estimate

(c) advise the Contractor that the Employer does not intend to proceed with the Change.

39.2.3 Upon receipt of the Employer's instruction to proceed under GC Sub-Clause 39.2.2 (a), the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with GC Sub-Clause 39.2.1.

39.2.4 The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If such rates and prices are inequitable, the Parties thereto shall agree on specific rates for the valuation of the Change.

39.2.5 If before or during the preparation of the Change Proposal it becomes apparent that the aggregate effect of compliance therewith and with all other Change Orders that have already become binding upon the Contractor under this GC Clause 39 would be to increase or decrease the Contract Price as originally set forth in Article 2 (Contract Price) of the Contract Agreement by more than fifteen percent (15%), the Contractor may give a written notice of objection thereto prior to furnishing the Change Proposal as aforesaid. If the Employer accepts the Contractor’s objection, the Employer shall withdraw the proposed Change and shall notify the Contractor in writing thereof.

The Contractor’s failure to so object shall neither affect its right to object to any subsequent requested Changes or Change Orders herein, nor affect its right to take into account, when making such subsequent objection, the percentage increase or decrease in the Contract Price that any Change not objected to by the Contractor represents.

39.2.6 Upon receipt of the Change Proposal, the Employer and the Contractor shall mutually agree upon all matters therein contained. Within fourteen (14) days after such agreement, the Employer shall, if it intends to proceed with the Change, issue the Contractor with a Change Order.

If the Employer is unable to reach a decision within fourteen (14) days, it shall notify the Contractor with
details of when the Contractor can expect a decision.

If the Employer decides not to proceed with the Change for whatever reason, it shall, within the said period of fourteen (14) days, notify the Contractor accordingly. Under such circumstances, the Contractor shall be entitled to reimbursement of all costs reasonably incurred by it in the preparation of the Change Proposal, provided that these do not exceed the amount given by the Contractor in its Estimate for Change Proposal submitted in accordance with GC Sub-Clause 39.2.2.

39.2.7 If the Employer and the Contractor cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Completion, or any other matters identified in the Change Proposal, the Employer may nevertheless instruct the Contractor to proceed with the Change by issue of a “Pending Agreement Change Order.”

Upon receipt of a Pending Agreement Change Order, the Contractor shall immediately proceed with effecting the Changes covered by such Order. The Parties shall thereafter attempt to reach agreement on the outstanding issues under the Change Proposal.

If the Parties cannot reach agreement within sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter may be referred to the Dispute Board in accordance with the provisions of GC Sub-Clause 46.1.

39.3 Changes Originating from Contractor

39.3.1 If the Contractor proposes a Change pursuant to GC Sub-Clause 39.1.2, the Contractor shall submit to the Project Manager a written “Application for Change Proposal,” giving reasons for the proposed Change and including the information specified in GC Sub-Clause 39.2.1.

Upon receipt of the Application for Change Proposal, the Parties shall follow the procedures outlined in GC Sub-Clauses 39.2.6 and 39.2.7. However, should the Employer choose not to proceed, the Contractor shall not be entitled to recover the costs of preparing the Application for Change Proposal.

40. Extension of Time for Completion

40.1 The Time(s) for Completion specified in the PC pursuant to GC Sub-Clause 8.2 shall be extended if the Contractor is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following:
(a) any Change in the Facilities as provided in GC Clause 39

(b) any occurrence of Force Majeure as provided in GC Clause 37, unforeseen conditions as provided in GC Clause 35, or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GC Sub-Clause 32.2

(c) any suspension order given by the Employer under GC Clause 41 hereof or reduction in the rate of progress pursuant to GC Sub-Clause 41.2 or

(d) any changes in laws and regulations as provided in GC Clause 36 or

(e) any default or breach of the Contract by the Employer, Appendix to the Contract Agreement titled ,or any activity, act or omission of the Employer, or the Project Manager, or any other contractors employed by the Employer, or

(f) any delay on the part of a sub-contractor, provided such delay is due to a cause for which the Contractor himself would have been entitled to an extension of time under this sub-clause, or

(g) delays attributable to the Employer or caused by customs, or

(h) any other matter specifically mentioned in the Contract

by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.

40.2 Except where otherwise specifically provided in the Contract, the Contractor shall submit to the Project Manager a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Employer and the Contractor shall agree upon the period of such extension. In the event that the Contractor does not accept the Employer’s estimate of a fair and reasonable time extension, the Contractor shall be entitled to refer the matter to a Dispute Board, pursuant to GC Sub-Clause 46.1.

The Contractor shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract.

In all cases where the Contractor has given a notice of a claim for an
extension of time under GC 40.2, the Contractor shall consult with the Project Manager in order to determine the steps (if any) which can be taken to overcome or minimize the actual or anticipated delay. The Contractor shall thereafter comply with all reasonable instructions which the Project Manager shall give in order to minimize such delay. If compliance with such instructions shall cause the Contractor to incur extra costs and the Contractor is entitled to an extension of time under GC 40.1, the amount of such extra costs shall be added to the Contract Price.

41. Suspension

41.1 The Employer may request the Project Manager, by notice to the Contractor, to order the Contractor to suspend performance of any or all of its obligations under the Contract. Such notice shall specify the obligation of which performance is to be suspended, the effective date of the suspension and the reasons therefor. The Contractor shall thereupon suspend performance of such obligation, except those obligations necessary for the care or preservation of the Facilities, until ordered in writing to resume such performance by the Project Manager.

If, by virtue of a suspension order given by the Project Manager, other than by reason of the Contractor’s default or breach of the Contract, the Contractor’s performance of any of its obligations is suspended for an aggregate period of more than ninety (90) days, then at any time thereafter and provided that at that time such performance is still suspended, the Contractor may give a notice to the Project Manager requiring that the Employer shall, within twenty-eight (28) days of receipt of the notice, order the resumption of such performance or request and subsequently order a change in accordance with GC Clause 39, excluding the performance of the suspended obligations from the Contract.

If the Employer fails to do so within such period, the Contractor may, by a further notice to the Project Manager, elect to treat the suspension, where it affects a part only of the Facilities, as a deletion of such part in accordance with GC Clause 39 or, where it affects the whole of the Facilities, as termination of the Contract under GC Sub-Clause 42.1.

41.2 If

(a) the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to the Appendix to the Contract Agreement titled Terms and Procedures of Payment, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon as stipulated in GC Sub-Clause 12.3, requires approval of such invoice or
supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, or fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Contractor’s notice or

(b) the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, including but not limited to the Employer’s failure to provide possession of or access to the Site or other areas in accordance with GC Sub-Clause 10.2, or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities,

then the Contractor may by fourteen (14) days’ notice to the Employer suspend performance of all or any of its obligations under the Contract, or reduce the rate of progress.

41.3 If the Contractor’s performance of its obligations is suspended or the rate of progress is reduced pursuant to this GC Clause 41, then the Time for Completion shall be extended in accordance with GC Sub-Clause 40.1, and any and all additional costs or expenses incurred by the Contractor as a result of such suspension or reduction shall be paid by the Employer to the Contractor in addition to the Contract Price, except in the case of suspension order or reduction in the rate of progress by reason of the Contractor’s default or breach of the Contract.

41.4 During the period of suspension, the Contractor shall not remove from the Site any Plant, any part of the Facilities or any Contractor’s Equipment, without the prior written consent of the Employer.

42. Termination

42.1 Termination for Employer’s Convenience

42.1.1 The Employer may at any time terminate the Contract for any reason by giving the Contractor a notice of termination that refers to this GC Sub-Clause 42.1.

42.1.2 Upon receipt of the notice of termination under GC Sub-Clause 42.1.1, the Contractor shall either immediately or upon the date specified in the notice of termination

(a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to
leave the Site in a clean and safe condition

(b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii) below

(c) remove all Contractor’s Equipment from the Site, repatriate the Contractor’s and its Subcontractors’ personnel from the Site, remove from the Site any wreckage, rubbish and debris of any kind, and leave the whole of the Site in a clean and safe condition, and

(d) subject to the payment specified in GC Sub-Clause 42.1.3,

(i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination

(ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors; and

(iii) deliver to the Employer all non-proprietary drawings, specifications and other documents prepared by the Contractor or its Subcontractors as at the date of termination in connection with the Facilities.

42.1.3 In the event of termination of the Contract under GC Sub-Clause 42.1.1, the Employer shall pay to the Contractor the following amounts:

(a) the Contract Price, properly attributable to the parts of the Facilities executed by the Contractor as of the date of termination

(b) the costs reasonably incurred by the Contractor in the removal of the Contractor’s Equipment from the Site and in the repatriation of the Contractor’s and its Subcontractors’ personnel

(c) any amounts to be paid by the Contractor to its Subcontractors in connection with the termination of any subcontracts, including any cancellation charges
(d) costs incurred by the Contractor in protecting the Facilities and leaving the Site in a clean and safe condition pursuant to paragraph (a) of GC Sub-Clause 42.1.2

(e) the cost of satisfying all other obligations, commitments and claims that the Contractor may in good faith have undertaken with third Parties in connection with the Contract and that are not covered by paragraphs (a) through (d) above.

42.2 Termination for Contractor’s Default

42.2.1 The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefor to the Contractor, referring to this GC Sub-Clause 42.2:

(a) if the Contractor becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, if the Contractor is a corporation, a resolution is passed or order is made for its winding up, other than a voluntary liquidation for the purposes of amalgamation or reconstruction, a receiver is appointed over any part of its undertaking or assets, or if the Contractor takes or suffers any other analogous action in consequence of debt

(b) if the Contractor assigns or transfers the Contract or any right or interest therein in violation of the provision of GC Clause 43.

(c) if the Contractor, in the judgment of the Employer has engaged in corrupt, collusive, coercive, or fraudulent practices, as defined in GC Clause 6, in competing for or in executing the Contract.

42.2.2 If the Contractor

(a) has abandoned or repudiated the Contract

(b) has without valid reason failed to commence work on the Facilities promptly or has suspended, other than pursuant to GC Sub-Clause 41.2, the progress of Contract performance for more than twenty-eight (28) days after receiving a written instruction from the Employer to proceed

(c) persistently fails to execute the Contract in accordance with the Contract or persistently neglects to carry out its obligations under the Contract
without just cause

(d) refuses or is unable to provide sufficient materials, services or labor to execute and complete the Facilities in the manner specified in the program furnished under GC Sub-Clause 18.2 at rates of progress that give reasonable assurance to the Employer that the Contractor can attain Completion of the Facilities by the Time for Completion as extended,

then the Employer may, without prejudice to any other rights it may possess under the Contract, give a notice to the Contractor stating the nature of the default and requiring the Contractor to remedy the same. If the Contractor fails to remedy or to take steps to remedy the same within fourteen (14) days of its receipt of such notice, then the Employer may terminate the Contract forthwith by giving a notice of termination to the Contractor that refers to this GC Sub-Clause 42.2.

42.2.3 Upon receipt of the notice of termination under GC Sub-Claus es 42.2.1 or 42.2.2, the Contractor shall, either immediately or upon such date as is specified in the notice of termination,

(a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition

(b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) below

(c) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination

(d) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors

(e) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its Subcontractors as of the date of termination in connection with the Facilities.
42.2.4 The Employer may enter upon the Site, expel the Contractor, and complete the Facilities itself or by employing any third Party. The Employer may, to the exclusion of any right of the Contractor over the same, take over and use with the payment of a fair rental rate to the Contractor, with all the maintenance costs to the account of the Employer and with an indemnification by the Employer for all liability including damage or injury to persons arising out of the Employer’s use of such equipment, any Contractor’s Equipment owned by the Contractor and on the Site in connection with the Facilities for such reasonable period as the Employer considers expedient for the supply and installation of the Facilities.

Upon completion of the Facilities or at such earlier date as the Employer thinks appropriate, the Employer shall give notice to the Contractor that such Contractor’s Equipment will be returned to the Contractor at or near the Site and shall return such Contractor’s Equipment to the Contractor in accordance with such notice. The Contractor shall thereafter without delay and at its cost remove or arrange removal of the same from the Site.

42.2.5 Subject to GC Sub-Clause 42.2.6, the Contractor shall be entitled to be paid the Contract Price attributable to the Facilities executed as of the date of termination, the value of any unused or partially used Plant on the Site, and the costs, if any, incurred in protecting the Facilities and in leaving the Site in a clean and safe condition pursuant to paragraph (a) of GC Sub-Clause 42.2.3. Any sums due the Employer from the Contractor accruing prior to the date of termination shall be deducted from the amount to be paid to the Contractor under this Contract.

42.2.6 If the Employer completes the Facilities, the cost of completing the Facilities by the Employer shall be determined.

If the sum that the Contractor is entitled to be paid, pursuant to GC Sub-Clause 42.2.5, plus the reasonable costs incurred by the Employer in completing the Facilities, exceeds the Contract Price, the Contractor shall be liable for such excess.

If such excess is greater than the sums due the Contractor under GC Sub-Clause 42.2.5, the Contractor shall pay the balance to the Employer, and if such excess is less than the sums due the Contractor under GC Sub-Clause 42.2.5, the Employer shall pay the balance to the Contractor.

The Employer and the Contractor shall agree, in writing,
on the computation described above and the manner in which any sums shall be paid.

42.3 Termination by the Contractor

42.3.1 If

(a) the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to the Appendix to the Contract Agreement titled Terms and Procedures of Payment, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon as stipulated in GC Sub-Clause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Contractor’s notice, or

(b) the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, including but not limited to the Employer’s failure to provide possession of or access to the Site or other areas or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities,

then the Contractor may give a notice to the Employer thereof, and if the Employer has failed to pay the outstanding sum, to approve the invoice or supporting documents, to give its reasons for withholding such approval, or to remedy the breach within twenty-eight (28) days of such notice, or if the Contractor is still unable to carry out any of its obligations under the Contract for any reason attributable to the Employer within twenty-eight (28) days of the said notice, the Contractor may by a further notice to the Employer referring to this GC Sub-Clause 42.3.1, forthwith terminate the Contract.

42.3.2 The Contractor may terminate the Contract forthwith by giving a notice to the Employer to that effect, referring to this GC Sub-Clause 42.3.2, if the Employer becomes
bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, being a corporation, if a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Employer takes or suffers any other analogous action in consequence of debt.

42.3.3 If the Contract is terminated under GC Sub-Clausess 42.3.1 or 42.3.2, then the Contractor shall immediately

(a) cease all further work, except for such work as may be necessary for the purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition

(b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii)

(c) remove all Contractor’s Equipment from the Site and repatriate the Contractor’s and its Subcontractors’ personnel from the Site, and

(d) subject to the payment specified in GC Sub-Clause 42.3.4,

(i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination

(ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors, and

(iii) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its Subcontractors as of the date of termination in connection with the Facilities.

42.3.4 If the Contract is terminated under GC Sub-Clausess 42.3.1 or 42.3.2, the Employer shall pay to the Contractor all payments specified in GC Sub-Clause 42.1.3, and reasonable compensation for all loss, except for loss of profit, or damage sustained by the Contractor arising out
of, in connection with or in consequence of such termination.

42.3.5 Termination by the Contractor pursuant to this GC Sub-Clause 42.3 is without prejudice to any other rights or remedies of the Contractor that may be exercised in lieu of or in addition to rights conferred by GC Sub-Clause 42.3.

42.4 In this GC Clause 42, the expression “Facilities executed” shall include all work executed, Installation Services provided, and all Plant acquired, or subject to a legally binding obligation to purchase, by the Contractor and used or intended to be used for the purpose of the Facilities, up to and including the date of termination.

42.5 In this GC Clause 42, in calculating any monies due from the Employer to the Contractor, account shall be taken of any sum previously paid by the Employer to the Contractor under the Contract, including any advance payment paid pursuant to the Appendix to the Contract Agreement titled Terms and Procedures of Payment.

43. Assignment

43.1 Neither the Employer nor the Contractor shall, without the express prior written consent of the other Party, which consent shall not be unreasonably withheld, assign to any third Party the Contract or any part thereof, or any right, benefit, obligation or interest therein or thereunder, except that the Contractor shall be entitled to assign either absolutely or by way of charge any monies due and payable to it or that may become due and payable to it under the Contract.

44. Export Restrictions

44.1 Notwithstanding any obligation under the Contract to complete all export formalities, any export restrictions attributable to the Employer, to the country of the Employer or to the use of the Plant and Installation Services to be supplied which arise from trade regulations from a country supplying those Plant and Installation Services, and which substantially impede the Contractor from meeting its obligations under the Contract, shall release the Contractor from the obligation to provide deliveries or services, always provided, however, that the Contractor can demonstrate to the satisfaction of the Employer and of the Bank that it has completed all formalities in a timely manner, including applying for permits, authorizations and licenses necessary for the export of the Plant and Installation Services under the terms of the Contract. Termination of the Contract on this basis shall be for the Employer’s convenience pursuant to Sub-Clause 42.1.
Claims, Disputes and Arbitration

45. Contractor’s Claims

45.1 If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall submit a notice to the Project Manager, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.

The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Project Manager. Without admitting the Employer’s liability, the Project Manager may, after receiving any notice under this Sub-Clause, monitor the record-keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Project Manager to inspect all these records, and shall (if instructed) submit copies to the Project Manager.

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Project Manager, the Contractor shall send to the Project Manager a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

(a) this fully detailed claim shall be considered as interim;

(b) the Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the Project Manager may reasonably require; and

(c) the Contractor shall send a final claim within 28 days after
the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Project Manager.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Project Manager and approved by the Contractor, the Project Manager shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within such time.

Each Payment Certificate shall include such amounts for any claim as have been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

The Project Manager shall agree with the Contractor or estimate: (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with GC Clause 40, and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause.

In the event that the Contractor and the Employer cannot agree on any matter relating to a claim, either Party may refer the matter to the Dispute Board pursuant to GC 46 hereof.

### 46. Disputes and Arbitration

#### 46.1 Appointment of the Dispute Board

Disputes shall be referred to a DB for decision in accordance with GC Sub-Clause 46.3. The Parties shall appoint a DB by the date stated in the PC.

The DB shall comprise, as stated in the PC, either one or three suitably qualified persons (“the members”), each of whom shall be fluent in the language for communication defined in the Contract and shall be a professional experienced in the type of activities involved in the performance of the Contract and with the interpretation of contractual documents. If the number is not
so stated and the Parties do not agree otherwise, the DB shall comprise three persons, one of whom shall serve as chairman.

If the Parties have not jointly appointed the DB 21 days before the date stated in the PC and the DB is to comprise three persons, each Party shall nominate one member for the approval of the other Party. The first two members shall recommend and the Parties shall agree upon the third member, who shall act as chairman.

However, if a list of potential members is included in the PC, the members shall be selected from those on the list, other than anyone who is unable or unwilling to accept appointment to the DB.

The agreement between the Parties and either the sole member or each of the three members shall incorporate by reference the General Conditions of Dispute Board Agreement contained in the Appendix to these General Conditions, with such amendments as are agreed between them.

The terms of the remuneration of either the sole member or each of the three members, including the remuneration of any expert whom the DB consults, shall be mutually agreed upon by the Parties when agreeing the terms of appointment of the member or such expert (as the case may be). Each Party shall be responsible for paying one-half of this remuneration.

If a member declines to act or is unable to act as a result of death, disability, resignation or termination of appointment, a replacement shall be appointed in the same manner as the replaced person was required to have been nominated or agreed upon, as described in this Sub-Clause.

The appointment of any member may be terminated by mutual agreement of both Parties, but not by the Employer or the Contractor acting alone. Unless otherwise agreed by both Parties, the appointment of the DB (including each member) shall expire when the Operational Acceptance Certificate has been issued in accordance with GC Sub-Clause 25.3.

46.2 Failure to Agree on the Composition of the Dispute Board

If any of the following conditions apply, namely:

(a) the Parties fail to agree upon the appointment of the sole member of the DB by the date stated in the first paragraph of GC Sub-Clause 46.1,

either Party fails to nominate a member (for approval by the other Party) of a DB of three persons by such date,
the Parties fail to agree upon the appointment of the third member (to act as chairman) of the DB by such date, or

the Parties fail to agree upon the appointment of a replacement person within 42 days after the date on which the sole member or one of the three members declines to act or is unable to act as a result of death, disability, resignation or termination of appointment,

then the appointing entity or official named in the PC shall, upon the request of either or both of the Parties and after due consultation with both Parties, appoint this member of the DB. This appointment shall be final and conclusive. Each Party shall be responsible for paying one-half of the remuneration of the appointing entity or official.

46.3 Obtaining Dispute Board’s Decision

If a dispute (of any kind whatsoever) arises between the Parties in connection with the performance of the Contract, including any dispute as to any certificate, determination, instruction, opinion or valuation of the Project Manager, either Party may refer the dispute in writing to the DB for its decision, with copies to the other Party and the Project Manager. Such reference shall state that it is given under this Sub-Clause.

For a DB of three persons, the DB shall be deemed to have received such reference on the date when it is received by the chairman of the DB.

Both Parties shall promptly make available to the DB all such additional information, further access to the Site, and appropriate facilities, as the DB may require for the purposes of making a decision on such dispute. The DB shall be deemed to be not acting as arbitrator(s).

Within 84 days after receiving such reference, or within such other period as may be proposed by the DB and approved by both Parties, the DB shall give its decision, which shall be reasoned and shall state that it is given under this Sub-Clause. The decision shall be binding on both Parties, who shall promptly give effect to it unless and until it shall be revised in an amicable settlement or an arbitral award as described below. Unless the Contract has already been abandoned, repudiated or terminated, the Contractor shall continue with the performance of the Facilities in accordance with the Contract.

If either Party is dissatisfied with the DB’s decision, then either Party may, within 28 days after receiving the decision, give notice to the other Party of its dissatisfaction and intention to commence arbitration. If the DB fails to give its decision within
the period of 84 days (or as otherwise approved) after receiving such reference, then either Party may, within 28 days after this period has expired, give notice to the other Party of its dissatisfaction and intention to commence arbitration.

In either event, this notice of dissatisfaction shall state that it is given under this Sub-Clause, and shall set out the matter in dispute and the reason(s) for dissatisfaction. Except as stated in GC Sub-Clausess 46.6 and 46.7, neither Party shall be entitled to commence arbitration of a dispute unless a notice of dissatisfaction has been given in accordance with this Sub-Clause.

If the DB has given its decision as to a matter in dispute to both Parties, and no notice of dissatisfaction has been given by either Party within 28 days after it received the DB’s decision, then the decision shall become final and binding upon both Parties.

46.4 Amicable Settlement

Where notice of dissatisfaction has been given under GC Sub-Clause 46.3 above, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, arbitration may be commenced on or after the fifty-sixth day after the day on which notice of dissatisfaction and intention to commence arbitration was given, even if no attempt at amicable settlement has been made.

46.5 Arbitration

Unless indicated otherwise in the PC, any dispute not settled amicably and in respect of which the DB’s decision (if any) has not become final and binding shall be finally settled by arbitration. Unless otherwise agreed by both Parties, arbitration shall be conducted as follows:

(a) For contracts with foreign contractors:

(i) international arbitration with proceedings administered by the international arbitration institution appointed in the PC, in accordance with the rules of arbitration of the appointed institution;

(ii) the place of arbitration shall be the city where the headquarters of the appointed arbitration institution is located or such other place selected in accordance with the applicable arbitration rules; and

(iii) the arbitration shall be conducted in the language for communications defined in Sub-Clause 5.3; and
(b) For contracts with domestic contractors, arbitration with proceedings conducted in accordance with the laws of the Employer’s country.

The arbitrator(s) shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Project Manager, and any decision of the DB, relevant to the dispute. Nothing shall disqualify the Project Manager from being called as a witness and giving evidence before the arbitrator(s) on any matter whatsoever relevant to the dispute.

Neither Party shall be limited in the proceedings before the arbitrator(s) to the evidence nor did arguments previously put before the DB to obtain its decision, or to the reasons for dissatisfaction given in its notice of dissatisfaction. Any decision of the DB shall be admissible in evidence in the arbitration.

Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Project Manager and the DB shall not be altered by reason of any arbitration being conducted during the progress of the Works.

46.6 Failure to Comply with Dispute Board’s Decision

In the event that a Party fails to comply with a DB decision which has become final and binding, then the other Party may, without prejudice to any other rights it may have, refer the failure itself to arbitration under GC Sub-Clause 46.5. GC Sub-Clauses 46.3 and 46.4 shall not apply to this reference.

46.7 Expiry of Dispute Board’s Appointment

If a dispute arises between the Parties in connection with the performance of the Contract, and there is no DB in place, whether by reason of the expiry of the DB’s appointment or otherwise:

(a) GC Sub-Clauses 46.3 and 46.4 shall not apply, and

(b) the dispute may be referred directly to arbitration under GC Sub-Clause 46.5
APPENDIX

A  General Conditions of Dispute Board Agreement

1. Definitions

Each “Dispute Board Agreement” is a tripartite agreement by and between:

The “Employer”;

The “Contractor”; and

The “Member” who is defined in the Dispute Board Agreement as being:

(i) the sole member of the “DB” and, where this is the case, all references to the “Other Members” do not apply, or

(ii) one of the three persons who are jointly called the “DB” (or “dispute board”) and, where this is the case, the other two persons are called the “Other Members”.

The Employer and the Contractor have entered (or intend to enter) into a contract, which is called the “Contract” and is defined in the Dispute Board Agreement, which incorporates this Appendix. In the Dispute Board Agreement, words and expressions which are not otherwise defined shall have the meanings assigned to them in the Contract.

2. General Provisions

Unless otherwise stated in the Dispute Board Agreement, it shall take effect on the latest of the following dates:

(a) the Commencement Date defined in the Contract,

(b) when the Employer, the Contractor and the Member have each signed the Dispute Board Agreement, or

(c) when the Employer, the Contractor and each of the Other Members (if any) have respectively each signed a dispute board agreement.

This employment of the Member is a personal appointment. At any time, the Member may give not less than 70 days’ notice of resignation to the Employer and to the Contractor, and the Dispute Board Agreement shall terminate upon the expiry of this period.

3. Warranties

The Member warrants and agrees that he/she is and shall be impartial and independent of the Employer, the Contractor and the Project Manager. The Member shall promptly disclose, to each of them and to the Other Members (if any), any fact or circumstance which might appear inconsistent with his/her warranty and agreement of impartiality and independence.

When appointing the Member, the Employer and the Contractor relied upon the Member’s representations that he/she is:

(a) experienced in the work which the Contractor is to carry out under the Contract,
Section VII. General Conditions

4. General Obligations of the Member

The Member shall:

(a) have no interest financial or otherwise in the Employer, the Contractor or the Project Manager, nor any financial interest in the Contract except for payment under the Dispute Board Agreement;

(b) not previously have been employed as a consultant or otherwise by the Employer, the Contractor or the Project Manager, except in such circumstances as were disclosed in writing to the Employer and the Contractor before they signed the Dispute Board Agreement;

(c) have disclosed in writing to the Employer, the Contractor and the Other Members (if any), before entering into the Dispute Board Agreement and to his/her best knowledge and recollection, any professional or personal relationships with any director, officer or employee of the Employer, the Contractor or the Project Manager, and any previous involvement in the overall project of which the Contract forms part;

(d) not, for the duration of the Dispute Board Agreement, be employed as a consultant or otherwise by the Employer, the Contractor or the Project Manager, except as may be agreed in writing by the Employer, the Contractor and the Other Members (if any);

(e) comply with the annexed procedural rules and with GC Sub-Clause 46.3;

(f) not give advice to the Employer, the Contractor, the Employer’s Personnel or the Contractor’s Personnel concerning the conduct of the Contract, other than in accordance with the annexed procedural rules;

(g) not while a Member enter into discussions or make any agreement with the Employer, the Contractor or the Project Manager regarding employment by any of them, whether as a consultant or otherwise, after ceasing to act under the Dispute Board Agreement;

(h) ensure his/her availability for all site visits and hearings as are necessary;

(i) become conversant with the Contract and with the progress of the Facilities (and of any other parts of the project of which the Contract forms part) by studying all documents received which shall be maintained in a current working file;

(j) treat the details of the Contract and all the DB’s activities and hearings as private and confidential, and not publish or disclose them without the prior written consent of the Employer, the Contractor and the Other Members (if any); and

(k) be available to give advice and opinions, on any matter relevant to the Contract when requested by both the Employer and the Contractor, subject to the agreement of the Other Members (if any).

5. General Obligations of the Employer and the Contractor

(b) experienced in the interpretation of contract documentation, and

(c) fluent in the language for communications defined in the Contract.
The Employer, the Contractor, the Employer’s Personnel and the Contractor’s Personnel shall not request advice from or consultation with the Member regarding the Contract, otherwise than in the normal course of the DB’s activities under the Contract and the Dispute Board Agreement. The Employer and the Contractor shall be responsible for compliance with this provision, by the Employer’s Personnel and the Contractor’s Personnel respectively.

The Employer and the Contractor undertake to each other and to the Member that the Member shall not, except as otherwise agreed in writing by the Employer, the Contractor, the Member and the Other Members (if any):

(a) be appointed as an arbitrator in any arbitration under the Contract;
(b) be called as a witness to give evidence concerning any dispute before arbitrator(s) appointed for any arbitration under the Contract; or
(c) be liable for any claims for anything done or omitted in the discharge or purported discharge of the Member’s functions, unless the act or omission is shown to have been in bad faith.

The Employer and the Contractor hereby jointly and severally indemnify and hold the Member harmless against and from claims from which he is relieved from liability under the preceding paragraph.

Whenever the Employer or the Contractor refers a dispute to the DB under GC Sub-Clause 46.3, which will require the Member to make a site visit and attend a hearing, the Employer or the Contractor shall provide appropriate security for a sum equivalent to the reasonable expenses to be incurred by the Member. No account shall be taken of any other payments due or paid to the Member.

6. Payment

The Member shall be paid as follows, in the currency named in the Dispute Board Agreement:

(a) a retainer fee per calendar month, which shall be considered as payment in full for:
   (i) being available on 28 days’ notice for all site visits and hearings;
   (ii) becoming and remaining conversant with all project developments and maintaining relevant files;
   (iii) all office and overhead expenses including secretarial services, photocopying and office supplies incurred in connection with his duties; and
   (iv) all services performed hereunder except those referred to in sub-paragraphs (b) and (c) of this Clause.

The retainer fee shall be paid with effect from the last day of the calendar month in which the Dispute Board Agreement becomes effective; until the last day of the calendar month in which the Taking-Over Certificate is issued for the whole of the Works.

With effect from the first day of the calendar month following the month in which Taking-Over Certificate is issued for the whole of the Works, the retainer fee shall be reduced by one third This
reduced fee shall be paid until the first day of the calendar month in which the Member resigns or the Dispute Board Agreement is otherwise terminated.

(b) a daily fee which shall be considered as payment in full for:

(i) each day or part of a day up to a maximum of two days’ travel time in each direction for the journey between the Member’s home and the site, or another location of a meeting with the Other Members (if any);

(ii) each working day on site visits, hearings or preparing decisions; and

(iii) each day spent reading submissions in preparation for a hearing.

(c) all reasonable expenses including necessary travel expenses (air fare in less than first class, hotel and subsistence and other direct travel expenses) incurred in connection with the Member’s duties, as well as the cost of telephone calls, courier charges, faxes and telexes: a receipt shall be required for each item in excess of five percent of the daily fee referred to in sub-paragraph (b) of this Clause;

(d) any taxes properly levied in the Country on payments made to the Member (unless a national or permanent resident of the Country) under this Clause 6.

The retainer and daily fees shall be as specified in the Dispute Board Agreement. Unless it specifies otherwise, these fees shall remain fixed for the first 24 calendar months, and shall thereafter be adjusted by agreement between the Employer, the Contractor and the Member, at each anniversary of the date on which the Dispute Board Agreement became effective.

If the Parties fail to agree on the retainer fee or the daily fee the appointing entity or official named in the PC shall determine the amount of the fees to be used.

The Member shall submit invoices for payment of the monthly retainer and air fares quarterly in advance. Invoices for other expenses and for daily fees shall be submitted following the conclusion of a site visit or hearing. All invoices shall be accompanied by a brief description of activities performed during the relevant period and shall be addressed to the Contractor.

The Contractor shall pay each of the Member’s invoices in full within 56 calendar days after receiving each invoice and shall apply to the Employer (in the Statements under the Contract) for reimbursement of one-half of the amounts of these invoices. The Employer shall then pay the Contractor in accordance with the Contract.

If the Contractor fails to pay to the Member the amount to which he/she is entitled under the Dispute Board Agreement, the Employer shall pay the amount due to the Member and any other amount which may be required to maintain the operation of the DB; and without prejudice to the Employer’s rights or remedies. In addition to all other rights arising from this default, the Employer shall be entitled to reimbursement of all sums paid in excess of one-half of these payments, plus all costs of recovering these sums and financing charges calculated at the rate specified in accordance with GC Sub-Clause 12.3.

If the Member does not receive payment of the amount due within 70 days after submitting a valid invoice, the Member may (i) suspend his/her services (without notice) until the payment is received, and/or (ii) resign his/her appointment by giving notice under Clause 7.

7. Termination
At any time: (i) the Employer and the Contractor may jointly terminate the Dispute Board Agreement by giving 42 days’ notice to the Member; or (ii) the Member may resign as provided for in Clause 2.

If the Member fails to comply with the Dispute Board Agreement, the Employer and the Contractor may, without prejudice to their other rights, terminate it by notice to the Member. The notice shall take effect when received by the Member.

If the Employer or the Contractor fails to comply with the Dispute Board Agreement, the Member may, without prejudice to his other rights, terminate it by notice to the Employer and the Contractor. The notice shall take effect when received by them both.

Any such notice, resignation and termination shall be final and binding on the Employer, the Contractor and the Member. However, a notice by the Employer or the Contractor, but not by both, shall be of no effect.

8. Default of the Member

If the Member fails to comply with any of his obligations under Clause 4 concerning his impartiality or independence in relation to the Employer or the Contractor, he/she shall not be entitled to any fees or expenses hereunder and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses received by the Member and the Other Members (if any), for proceedings or decisions (if any) of the DB which are rendered void or ineffective by the said failure to comply.

9. Disputes

Any dispute or claim arising out of or in connection with this Dispute Board Agreement, or the breach, termination or invalidity thereof, shall be finally settled by institutional arbitration. If no other arbitration institute is agreed, the arbitration shall be conducted under the Rules of Arbitration of the International Chamber of Commerce by one arbitrator appointed in accordance with these Rules of Arbitration.
Annex

DISPUTE BOARD GUIDELINES

1. Unless otherwise agreed by the Employer and the Contractor, the DB shall visit the site at intervals of not more than 140 days, including times of critical construction events, at the request of either the Employer or the Contractor. Unless otherwise agreed by the Employer, the Contractor and the DB, the period between consecutive visits shall not be less than 70 days, except as required to convene a hearing as described below.

2. The timing of and agenda for each site visit shall be as agreed jointly by the DB, the Employer and the Contractor, or in the absence of agreement, shall be decided by the DB. The purpose of site visits is to enable the DB to become and remain acquainted with the progress of the Works and of any actual or potential problems or claims, and, as far as reasonable, to prevent potential problems or claims from becoming disputes.

3. Site visits shall be attended by the Employer, the Contractor and the Project Manager and shall be co-ordinated by the Employer in co-operation with the Contractor. The Employer shall ensure the provision of appropriate conference facilities and secretarial and copying services. At the conclusion of each site visit and before leaving the site, the DB shall prepare a report on its activities during the visit and shall send copies to the Employer and the Contractor.

4. The Employer and the Contractor shall furnish to the DB one copy of all documents which the DB may request, including Contract documents, progress reports, variation instructions, certificates and other documents pertinent to the performance of the Contract. All communications between the DB and the Employer or the Contractor shall be copied to the other Party. If the DB comprises three persons, the Employer and the Contractor shall send copies of these requested documents and these communications to each of these persons.

5. If any dispute is referred to the DB in accordance with GC Sub-Clause 46.3, the DB shall proceed in accordance with GC Sub-Clause 46.3 and these Guidelines. Subject to the time allowed to give notice of a decision and other relevant factors, the DB shall:

(a) act fairly and impartially as between the Employer and the Contractor, giving each of them a reasonable opportunity of putting his case and responding to the other’s case, and

(b) adopt procedures suitable to the dispute, avoiding unnecessary delay or expense.

6. The DB may conduct a hearing on the dispute, in which event it will decide on the date and place for the hearing and may request that written documentation and arguments from the Employer and the Contractor be presented to it prior to or at the hearing.

7. Except as otherwise agreed in writing by the Employer and the Contractor, the DB shall have power to adopt an inquisitorial procedure, to refuse admission to hearings or audience at hearings to any persons other than representatives of the Employer, the Contractor and the Project Manager, and to proceed in the absence of any Party who the DB is satisfied received notice of the hearing; but shall have discretion to decide whether and to what extent this power may be exercised.

8. The Employer and the Contractor empower the DB, among other things, to:
(a) establish the procedure to be applied in deciding a dispute,

(b) decide upon the DB’s own jurisdiction, and as to the scope of any dispute referred to it,

(c) conduct any hearing as it thinks fit, not being bound by any rules or procedures other than those contained in the Contract and these Guidelines,

(d) take the initiative in ascertaining the facts and matters required for a decision,

(e) make use of its own specialist knowledge, if any,

(f) decide upon the payment of financing charges in accordance with the Contract,

(g) decide upon any provisional relief such as interim or conservatory measures,

(h) open up, review and revise any certificate, decision, determination, instruction, opinion or valuation of the Project Manager, relevant to the dispute, and

(i) appoint, should the DB so consider necessary and the Parties agree, a suitable expert at the cost of the Parties to give advice on a specific matter relevant to the dispute.

9. The DB shall not express any opinions during any hearing concerning the merits of any arguments advanced by the Parties. Thereafter, the DB shall make and give its decision in accordance with GC Sub-Clause 46.3, or as otherwise agreed by the Employer and the Contractor in writing. If the DB comprises three persons:

(a) it shall convene in private after a hearing, in order to have discussions and prepare its decision;

(b) it shall endeavour to reach a unanimous decision: if this proves impossible the applicable decision shall be made by a majority of the Members, who may require the minority Member to prepare a written report for submission to the Employer and the Contractor; and

(c) if a Member fails to attend a meeting or hearing, or to fulfil any required function, the other two Members may nevertheless proceed to make a decision, unless:

(i) either the Employer or the Contractor does not agree that they do so, or

(ii) the absent Member is the chairman and he/she instructs the other Members to not make a decision.
Section VIII. Particular Conditions

The following Particular Conditions shall supplement the General Conditions in Section VII. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions.
## Table of Clauses

| PC1. | Definitions | 89 |
| PC5. | Law and Language | 89 |
| PC7. | Scope of Facilities | 89 |
| PC8. | Time for Commencement and Completion | 89 |
| PC13. | Securities | 89 |
| PC22 | Installation | 90 |
| PC25. | Commissioning and Operational Acceptance | 90 |
| PC26. | Completion Time Guarantee | 90 |
| PC27. | Defect Liability | 91 |
| PC46. | Disputes and Arbitration | 91 |
Particular Conditions

The following Particular Conditions (PC) shall supplement the General Conditions (GC). Whenever there is a conflict, the provisions herein shall prevail over those in the GC. The clause number of the PC is the corresponding clause number of the GC.

PC1. Definitions

The Employer is: Department of Hydrology and Meteorology

Building Resilience to Climate Related Hazards Project, Nagpokhari, Naxal, Kathmandu

The Project Manager is: Expert assigned by DHM; The Bank is: World Bank (International Development Association)

Country of Origin: all countries and territories as indicated in Section V of the bidding documents, Eligible Countries.

PC5. Law and Language

PC5.1 The Contract shall be interpreted in accordance with the laws of: Nepal.

PC5.2 The ruling language is: English

PC5.3 The language for communications is: English

PC7. Scope of Facilities

PC7.3 The Contractor agrees to supply spare parts for a period of years: 12 years

The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the Radar Plant. Other spare parts and components shall be supplied as promptly as possible, but at the most within six (6) months of placing the order and opening the letter of credit. In addition, in the event of termination of the production of spare parts, advance notification will be made to the Employer of the pending termination, with sufficient time to permit the Employer to procure the needed requirement. Following such termination, the Contractor will furnish to the extent possible and at no cost to the Employer the blueprints, drawings and specifications of the spare parts, if requested.

PC8. Time for Commencement and Completion

PC8.1 The Contractor shall commence work on the Facilities within Thirty (30) days from the Effective Date for determining Time for Completion as specified in the Contract Agreement.

PC8.2 The Time for Completion of the whole of the Facilities shall be 540 days from the Effective Date as described in the Contract Agreement.

PC13. Securities
PC13.3.1 The amount of performance security, as a percentage of the Contract Price for the Facility or for the part of the Facility for which a separate Time for Completion is provided, shall be: US Dollar 260,000 (Two hundred and sixty thousand)

PC13.3.2 The performance security shall be in the form of the Bank Guarantee attached hereto in Section IX, Contract Forms.

PC13.3.3 The performance security shall not be reduced on the date of the Operational Acceptance.

PC13.3.3 The performance security shall be reduced to ten percent (10%) of the value of the component covered by the extended defect liability to cover the Contractor’s extended defect liability in accordance with the provision in the PC, pursuant to GC Sub-Clause 27.10.

PC22 Installation

PC22.2.5 Working Hours

Normal working hours are: 40 hours per week; working hour as suitable for Installation.

PC22.2.8 Funeral Arrangements: The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.

Add Sub-clause 22.2.17 as under:

“During Installation and related works, the Contractor shall fully comply with directives as briefly stipulated in APPENDIX-9: Environment Management Action Plan (EMAP) and also Initial Environmental Examination (IEE) report related to this work provided by DHM.”

In Sub-clause 22.4 at the end of the paragraph, add the following text

“ The Contractor shall provide to workers, supervisors and visitors, all necessary safety gears such as Helmet, hand gloves, safety belt, boots and other safety devices as appropriate for work/site being undertaken/visited. Moreover, adequate amount of standard Safety First aid kit including a health personnel required should be available in short notice in a manner acceptable to DHM Supervising(PM) personnel.”

PC25. Commissioning and Operational Acceptance

PC25.2.2 The Guarantee Test of the Facilities shall be successfully completed within Thirty five days (35) from the date of Completion.

PC26. Completion Time Guarantee

PC26.2

Applicable rate for liquidated damages: 0.05 percent of Contract Price (without VAT and Provisional sum).
Maximum deduction for liquidated damages: Ten (10) percent of Contract Price (without VAT and Provisional sum).

PC26.3 No bonus will be given for earlier Completion of the Facilities or part thereof.

PC27. Defect Liability

PC 27.2 Replace the paragraph 1 as under

“The Defect Liability Period shall be 720 days from the date of Operational Acceptance of the Facilities (or any part thereof), whichever first occurs, unless specified otherwise in the PC pursuant to GC Sub-Clause 27.10.”

PC 27.2 In 2nd Paragraph, 4th line, please replace the word “Promptly” by “15 days and
Add at the end of PC 27.2 the paragraph as under

“Further, In connection with the remedying of defects The maximum downtime (defined as number of days for which the system is not usable because of inability of the bidder/ tenderer to repair it) of radar system for any cause is taken as 15 days. In case the system is not usable beyond the stipulated maximum downtime a deduction of 300 USD per day for duration of period exceeding maximum downtime shall be recovered from bidder’s due amount.”

PC 27.10 “Mechanical parts of the antenna system” has an extended Defects liability period of 360 days.

PC30. Limitation of Liability

PC30.1 (b) The multiplier of the Contract Price is: 1(One)

PC46. Disputes and Arbitration

PC46.1 The DB shall be appointed within [28 days] after the Effective Date.

PC46.1 The DB shall be: One member

PC46.1 List of potential DB members is: None

PC46.2 Appointment (if not agreed) to be made by: NEPCA (Nepal Council of Arbitration)

PC46.5 Procedure to settle disputes in respect of DB’s decisions: UNICITRAL

(a) Appointed arbitration institution: International Chamber of Commerce (ICC)
# Section IX. - Contract Forms

## Table of Forms

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification of Award - Letter of Acceptance</td>
<td>3-94</td>
</tr>
<tr>
<td><strong>Contract Agreement</strong></td>
<td>3-95</td>
</tr>
<tr>
<td>Appendix 1. Terms and Procedures of Payment</td>
<td>3-99</td>
</tr>
<tr>
<td>Appendix 2. Price Adjustment</td>
<td>3-102</td>
</tr>
<tr>
<td>Appendix 3. Insurance Requirements</td>
<td>3-104</td>
</tr>
<tr>
<td>Appendix 4. Time Schedule</td>
<td>3-107</td>
</tr>
<tr>
<td>Appendix 5. List of Major Items of Plant and Installation Services and List</td>
<td>3-108</td>
</tr>
<tr>
<td>Approved Subcontractors</td>
<td></td>
</tr>
<tr>
<td>Appendix 6. Scope of Works and Supply by the Employer</td>
<td>3-109</td>
</tr>
<tr>
<td>Appendix 7. List of Documents for Approval or Review</td>
<td>3-110</td>
</tr>
<tr>
<td>Appendix 8. Functional Guarantees</td>
<td>3-111</td>
</tr>
<tr>
<td><strong>Performance Security Forms – Bank Guarantee</strong></td>
<td>3-113</td>
</tr>
<tr>
<td>Bank Guarantee—Conditional</td>
<td>3-115</td>
</tr>
<tr>
<td>Bank Guarantee Form for Advance Payment</td>
<td>3-117</td>
</tr>
</tbody>
</table>
Notification of Award - Letter of Acceptance

To: __________________________

This is to notify you that your Bid dated ________ for execution of the ____________ for the Contract Price in the aggregate of __________________________, as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms included in Section IX, - Contract Forms, of the Bidding Document

Authorized Signature: __________________________
Name and Title of Signatory: __________________________
Name of Agency: __________________________

Attachment: Contract Agreement
Contract Agreement

THIS AGREEMENT is made the ________ day of ________________________, _____.
BETWEEN

(1) __________________, a corporation incorporated under the laws of __________ and having its principal place of business at ________________ (hereinafter called "the Employer"), and (2) __________________, a corporation incorporated under the laws of ________________ and having its principal place of business at ________________ (hereinafter called "the Contractor").

WHEREAS the Employer desires to engage the Contractor to design, manufacture, test, deliver, install, complete and commission certain Facilities, viz. __________________ ("the Facilities"), and the Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents (Reference GC Clause 2)
The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:

(a) This Contract Agreement and the Appendices hereto
(b) Letter of Bid and Price Schedules submitted by the Contractor
(c) Particular Conditions
(d) General Conditions
(e) Specification
(f) Drawings
(g) Other completed bidding forms submitted with the Bid
(h) Any other documents forming part of the Employer’s Requirements
(i) Any other documents shall be added here

1.2 Order of Precedence (Reference GC Clause 2)
In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions (Reference GC Clause 1)
Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions.

Article 2. Contract Price and Terms of Payment

2.1 Contract Price (Reference GC Clause 11)

The Employer hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of: ______________, ______________ as specified in Price Schedule No. 5 (Grand Summary), and ______________, ______________, or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.2 Terms of Payment (Reference GC Clause 12)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in the Appendix (Terms and Procedures of Payment) hereto.

The Employer may instruct its bank to issue an irrevocable confirmed documentary credit made available to the Contractor in a bank in the country of the Contractor. The credit shall be for an amount of ______________; and shall be subject to the Uniform Customs and Practice for Documentary Credits 1993 Revision, ICC Publication No. 600.

In the event that the amount payable under Schedule No. 1 is adjusted in accordance with GC 11.2 or with any of the other terms of the Contract, the Employer shall arrange for the documentary credit to be amended accordingly.

Article 3. Effective Date

3.1 Effective Date (Reference GC Clause 1)

The Effective Date from which the Time for Completion of the Facilities shall be counted is the date when all of the following conditions have been fulfilled:

(a) This Contract Agreement has been duly executed for and on behalf of the Employer and the Contractor;

(b) The Contractor has submitted to the Employer the performance security and the advance payment guarantee;

(c) The Employer has paid the Contractor the advance payment

(d) The Contractor has been advised that the documentary credit referred to in Article 2.2 above has been issued in its favor.

Each party shall use its best efforts to fulfill the above conditions for which it is responsible as soon as practicable.

3.2 If the conditions listed under 3.1 are not fulfilled within two (2) months from the date of this Contract notification because of reasons not attributable to the Contractor, the Parties shall
discuss and agree on an equitable adjustment to the Contract Price and the Time for Completion and/or other relevant conditions of the Contract.

**Article 4. Communications**

4.1 The address of the Employer for notice purposes, pursuant to GC 4.1 is: ____________________.

4.2 The address of the Contractor for notice purposes, pursuant to GC 4.1 is: ____________________.

**Article 5. Appendices**

5.1 The Appendices listed in the attached List of Appendices shall be deemed to form an integral part of this Contract Agreement.

5.2 Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by, for and on behalf of the Employer

[Signature]

[Title]

in the presence of ____________________________
Signed by, for and on behalf of the Contractor

[Signature]

[Title]

in the presence of

APPENDICES

Appendix 1 Terms and Procedures of Payment
Appendix 2 Price Adjustment
Appendix 3 Insurance Requirements
Appendix 4 Time Schedule
Appendix 5 List of Major Items of Plant and Installation Services and List of Approved Subcontractors
Appendix 6 Scope of Works and Supply by the Employer
Appendix 7 List of Documents for Approval or Review
Appendix 8 Functional Guarantees
Appendix 1. Terms and Procedures of Payment

In accordance with the provisions of GC Clause 12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, on the basis of the Price Breakdown given in the section on Price Schedules. Payments will be made in the currencies quoted by the Bidder unless otherwise agreed between the Parties. Applications for payment in respect of part deliveries may be made by the Contractor as work proceeds.

TERMS OF PAYMENT

Schedule No. 1. Plant and Equipment Supplied from Abroad

In respect of plant and equipment supplied from abroad, the following payments shall be made:

Ten percent (10%) of the total CIP amount as an advance payment against receipt of invoice and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer. The advance payment security may be reduced in proportion to the value of the plant and equipment delivered to the site, as evidenced by shipping and delivery documents.

Seventy percent (70%) of the total or pro rata CIP amount upon Incoterm “CIP”, upon delivery to the carrier within forty-five (45) days after receipt of documents.

Fifteen percent (15%) of the total or pro rata CIP amount upon issue of the Completion Certificate (Site Acceptance Test Certificate), within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata CIP amount upon issue of the Operational Acceptance Certificate, within forty-five (45) days after receipt of invoice.

Schedule No. 2. Plant and Equipment Supplied from within the Employer’s Country

In respect of plant and equipment supplied from within the Employer’s country, the following payments shall be made:

Ten percent (10%) of the total EXW amount as an advance payment against receipt of invoice, and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer. The advance payment security may be reduced in proportion to the value of the plant and equipment delivered to the site, as evidenced by shipping and delivery documents.

Eighty percent (80%) of the total or pro rata EXW amount upon Incoterm “Ex-Works,” upon delivery to the carrier within forty-five (45) days after receipt of invoice and documents.
Five percent (5%) of the total or pro rata EXW amount upon issue of the Completion Certificate, within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata EXW amount upon issue of the Operational Acceptance Certificate, within forty-five (45) days after receipt of invoice.

Schedule No. 3. Design Services

In respect of design services for both the foreign currency and the local currency portions, the following payments shall be made:

Ten percent (10%) of the total design services amount as an advance payment against receipt of invoice, and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer.

Ninety percent (90%) of the total or pro rata design services amount upon acceptance of design in accordance with GC Clause 20 by the Project Manager within forty-five (45) days after receipt of invoice.

Schedule No. 4. Installation Services

In respect of installation services for both the foreign and local currency portions, the following payments shall be made:

Ten percent (10%) of the total installation services amount as an advance payment against receipt of invoice, and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer. The advance payment security may be reduced in proportion to the value of work performed by the Contractor as evidenced by the invoices for installation services.

Eighty percent (80%) of the measured value of work performed by the Contractor, as identified in the said Program of Performance, during the preceding month, as evidenced by the Employer’s authorization of the Contractor’s application, will be made monthly within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata value of installation services performed by the Contractor as evidenced by the Employer’s authorization of the Contractor’s monthly applications, upon issue of the Completion Certificate, within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata value of installation services performed by the Contractor as evidenced by the Employer’s authorization of the Contractor’s monthly applications, upon issue of the Operational Acceptance Certificate, within forty-five (45) days after receipt of invoice.

In the event that the Employer fails to make any payment on its respective due date, the Employer shall pay to the Contractor interest on the amount of such delayed payment at the rate of one half percent (0.5%) per month and (0.25%) for local currency and foreign currency respectively for period of delay until payment has been made in full.
PAYMENT PROCEDURES

The procedures to be followed in applying for certification and making payments shall be as follows:
1. The Contractor shall submit the Payment Statement attaching all relevant documents to substantiate the claim amount.
2. The Project Manager will examine the Payment Statement submitted by the Contractor and certify the payable amount to the Employer by adjusting any omission, deduction, modification and correction in the Payment Statement.
3. The Employer will issue a Withdrawal Order to WB, and will pay the amount by means of Direct Payment from WB at the designated bank accounts of the Contractor at home country for the foreign currency and account in Nepal for the local currency.
Appendix 2. Price adjustment (Not Applicable)

Where the Contract Period (excluding the Defects Liability Period) exceeds eighteen (18) months, it is normal procedure that prices payable to the Contractor shall be subject to adjustment during the performance of the Contract to reflect changes occurring in the cost of labor and material components. In such cases the bidding documents shall include in this Appendix 2 a formula of the following general type, pursuant to GC Sub-Clause 11.2.

Where Contracts are of a shorter duration than eighteen (18) months or in cases where there is to be no Price Adjustment, the following provision shall not be included. Instead, it shall be indicated under this Appendix 2 that the prices are to remain firm and fixed for the duration of the Contract.

Sample Price Adjustment Formula

Prices payable to the Contractor, in accordance with the Contract, shall be subject to adjustment during performance of the Contract to reflect changes in the cost of labor and material components, in accordance with the following formula:

\[ P_1 = P_0 \times \left( a + b \frac{L_1}{L_0} + c \frac{M_1}{M_0} \right) - P_0 \]

in which:

- \( P_1 \) = adjustment amount payable to the Contractor
- \( P_0 \) = Contract price (base price)
- \( a \) = percentage of fixed element in Contract price (\( a = \_\% \))
- \( b \) = percentage of labor component in Contract price (\( b = \_\% \))
- \( c \) = percentage of material and equipment component in Contract price (\( c = \_\% \))
- \( L_0, L_1 \) = labor indices applicable to the appropriate industry in the country of origin on the base date and the date for adjustment, respectively
- \( M_0, M_1 \) = material and equipment indices in the country of origin on the base date and the date for adjustment, respectively

N.B. \( a+b+c = 100\% \).
Conditions Applicable To Price Adjustment

The Bidder shall indicate the source of labor and materials indices and the base date indices in its bid.

<table>
<thead>
<tr>
<th>Item</th>
<th>Source of Indices Used</th>
<th>Base Date Indices</th>
</tr>
</thead>
</table>

The base date shall be the date twenty-eight (28) days prior to the Bid closing date.

The date of adjustment shall be the mid-point of the period of manufacture or installation of component or Plant.

The following conditions shall apply:

(a) No price increase will be allowed beyond the original delivery date unless covered by an extension of time awarded by the Employer under the terms of the Contract. No price increase will be allowed for periods of delay for which the Contractor is responsible. The Employer will, however, be entitled to any price decrease occurring during such periods of delay.

(b) If the currency in which the Contract price, \( P_0 \), is expressed is different from the currency of the country of origin of the labor and/or materials indices, a correction factor will be applied to avoid incorrect adjustments of the Contract price. The correction factor shall correspond to the ratio of exchange rates between the two currencies on the base date and the date for adjustment as defined above.

(c) No price adjustment shall be payable on the portion of the Contract price paid to the Contractor as an advance payment.
Appendix 3. Insurance Requirements

Insurances to be Taken Out by the Contractor

In accordance with the provisions of GC Clause 34, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld.

(a) Cargo Insurance
Covering loss or damage occurring, while in transit from the supplier’s or manufacturer’s works or stores until arrival at the Site, to the Facilities (including spare parts therefor) and to the construction equipment to be provided by the Contractor or its Subcontractors.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>One hundred and ten (110) percent of CIP Surkhet destination</td>
<td>Nil</td>
<td>Contractor and DHM (Survey, Design, Supply, Delivery, Installation and Commissioning of Weather Radar (PPCR/DHM/G/ICB-29))</td>
<td>Place of dispatch</td>
<td>Delivery Site</td>
</tr>
</tbody>
</table>

(b) Installation All Risks Insurance
Covering physical loss or damage to the Facilities at the Site, occurring prior to completion of the Facilities, with an extended maintenance coverage for the Contractor’s liability in respect of any loss or damage occurring during the defect liability period while the Contractor is on the Site for the purpose of performing its obligations during the defect liability period.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>One hundred and ten (110) percent of Contract Price</td>
<td>Nil</td>
<td>Contractor, Subcontractor/s and DHM (Survey, Design, Supply, Delivery, Installation and Commissioning of Weather Radar (PPCR/DHM/G/ICB-29))</td>
<td>Contract Effective date</td>
<td>Up to end of Defects Liability Period</td>
</tr>
</tbody>
</table>
(c) **Third Party Liability Insurance**  
Covering bodily injury or death suffered by third parties (including the Employer’s personnel) and loss of or damage to property (including the Employer’s property and any parts of the Facilities that have been accepted by the Employer) occurring in connection with the supply and installation of the Facilities.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs Two (2) Million per occurrence with unlimited occurrence.</td>
<td>Nil</td>
<td>Contractors and Subcontractors</td>
<td>Commencement of work</td>
<td>Up to end of Defects Liability Period</td>
</tr>
</tbody>
</table>

(d) **Automobile Liability Insurance**  
Covering use of all vehicles used by the Contractor or its Subcontractors (whether or not owned by them) in connection with the supply and installation of the Facilities. Comprehensive insurance in accordance with statutory requirements.

(e) **Workers’ Compensation**  
In accordance with the statutory requirements applicable in any country where the Facilities or any part thereof is executed.

(f) **Employer’s Liability**  
In accordance with the statutory requirements applicable in any country where the Facilities or any part thereof is executed.

(g) **Other Insurances**  
The Contractor also required to may take out and maintain at its own cost the following insurances as necessary:

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 34.1, except for the Third Party Liability, Workers’ Compensation and Employer’s Liability Insurances, and the Contractor’s Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 34.1, except for the Cargo, Workers’ Compensation and Employer’s Liability Insurances. All insurer’s rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.
**Insurances To Be Taken Out By The Employer (Not applicable)**

The Employer shall at its expense take out and maintain in effect during the performance of the Contract the following insurances.

**Details:**

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
</table>

Appendix 4. Time Schedule

The following schedule is for reference only.

Agreed Time Schedule between the Employer and Contractor will be inserted here as a part of the contract Documents.

<table>
<thead>
<tr>
<th>weeks after contract commencement</th>
<th>Check point</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>All surveys completed and detailed construction plans ready</td>
</tr>
<tr>
<td>40</td>
<td>Factory acceptance test of the radar system</td>
</tr>
<tr>
<td>60</td>
<td>Radar tower ready for radar installation. Power station ready.</td>
</tr>
<tr>
<td>64</td>
<td>Site acceptance test of the radar system</td>
</tr>
<tr>
<td>65</td>
<td>Remaining civil works to be completed</td>
</tr>
<tr>
<td>77</td>
<td>Final acceptance</td>
</tr>
</tbody>
</table>
Appendix 5.  List of Major Items of Plant and Installation Services and List of Approved Subcontractors

A list of major items of Plant and Installation Services is provided below.

The following Subcontractors and/or manufacturers are approved for carrying out the items of the Facilities indicated below. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. In accordance with GC Sub-Clause 19.1, the Contractor is free to submit proposals for Subcontractors for additional items from time to time. No Subcontracts shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

<table>
<thead>
<tr>
<th>Major Items of Plant and Installation Services</th>
<th>Approved Subcontractors/Manufacturers</th>
<th>Nationality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 6. Scope of Works and Supply by the Employer

The following personnel, facilities, works and supplies will be provided/supplied by the Employer, and the provisions of GC Clauses 10, 21 and 24 shall apply as appropriate.

All personnel, facilities, works and supplies will be provided by the Employer in good time so as not to delay the performance of the Contractor, in accordance with the approved Time Schedule and Program of Performance pursuant to GC Sub-Clause 18.2.

Unless otherwise indicated, all personnel, facilities, works and supplies will be provided free of charge to the Contractor.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Charge to Contractor (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilities</td>
<td>Charge to Contractor (if any)</td>
</tr>
<tr>
<td>Works</td>
<td>Charge to Contractor (if any)</td>
</tr>
<tr>
<td>Supplies</td>
<td>Charge to Contractor (if any)</td>
</tr>
<tr>
<td>Electricity Source for Tapping within the working Site</td>
<td>None</td>
</tr>
</tbody>
</table>
Appendix 7. List of Documents for Approval or Review

Pursuant to GC Sub-Clause 20.3.1, the Contractor shall prepare, or cause its Subcontractor to prepare, and present to the Project Manager in accordance with the requirements of GC Sub-Clause 18.2 (Program of Performance), the following documents

- General layout of the radar site indicating the locations of the radar tower, the diesel power station, electricity connections between the two
- Drawings of the radar tower and the foundations (not for the offer but before start of building)
- Layout of the equipment room at the radar tower
- Documents related to the safety and security at the building site as required by the Nepalese legislation
- All other documents which DHM needs to get a building permission and also an approval of the completed works.
Appendix 8. Functional Guarantees (Not Applicable)

1. **General**

   This Appendix sets out
   
   (a) the functional guarantees referred to in GC Clause 28 (Functional Guarantees)
   
   (b) the preconditions to the validity of the functional guarantees, either in production and/or consumption, set forth below
   
   (c) the minimum level of the functional guarantees
   
   (d) the formula for calculation of liquidated damages for failure to attain the functional guarantees.

2. **Preconditions**

   The Contractor gives the functional guarantees (specified herein) for the facilities, subject to the following preconditions being fully satisfied:

3. **Functional Guarantees**

   Subject to compliance with the foregoing preconditions, the Contractor guarantees as follows:

   3.1 **Production Capacity**

   and/or

   3.2 **Raw Materials and Utilities Consumption**

4. **Failure in Guarantees and Liquidated Damages**

   4.1 **Failure to Attain Guaranteed Production Capacity**

   If the production capacity of the facilities attained in the guarantee test, pursuant to GC Sub-Clause 25.2, is less than the guaranteed figure specified in para. 3.1 above, but the actual production capacity attained in the guarantee test is not less than the minimum level specified in para. 4.3 below, and the Contractor elects to pay liquidated damages to the Employer in lieu of making changes, modifications and/or additions to the Facilities, pursuant to GC Sub-Clause 28.3, then the Contractor shall pay liquidated damages at the rate of ________________ for every complete one percent (1%) of the deficiency in the production capacity of the Facilities, or at a proportionately reduced rate for any deficiency, or part thereof, of less than a complete one percent (1%).
4.2 Raw Materials and Utilities Consumption in Excess of Guaranteed Level

If the actual measured figure of specified raw materials and utilities consumed per unit (or their average total cost of consumption) exceeds the guaranteed figure specified in para. 3.2 above (or their specified average total cost of consumption), but the actual consumption attained in the guarantee test, pursuant to GC Sub-Clause 25.2, is not more than the maximum level specified in para. 4.3 below, and the Contractor elects to pay liquidated damages to the Employer in lieu of making changes, modifications and/or additions to the Facilities pursuant to GC Sub-Clause 28.3, then the Contractor shall pay liquidated damages at the rate of [amount in the contract currency] for every complete one percent (1%) of the excess consumption of the Facilities, or part thereof, of less than a complete one percent (1%).

4.3 Minimum Levels

Notwithstanding the provisions of this paragraph, if as a result of the guarantee test(s), the following minimum levels of performance guarantees (and consumption guarantees) are not attained by the Contractor, the Contractor shall at its own cost make good any deficiencies until the Facilities reach any of such minimum performance levels, pursuant to GC Sub-Clause 28.2:

(a) production capacity of the Facilities attained in the guarantee test: ninety-five percent (95%) of the guaranteed production capacity (the values offered by the Contractor in its bid for functional guarantees represents 100%).

and/or

(b) average total cost of consumption of all the raw materials and utilities of the Facilities: one hundred and five percent (105%) of the guaranteed figures (the figures offered by the Contractor in its bid for functional guarantees represents 100%).

4.4 Limitation of Liability

Subject to para. 4.3 above, the Contractor’s aggregate liability to pay liquidated damages for failure to attain the functional guarantees shall not exceed ______ percent (___ %) of the Contract price
Performance Security Form – **Bank Guarantee**\(^\text{14}\)

__________________________________________

**Beneficiary:**

**Date:** __________

**PERFORMANCE GUARANTEE No.:** ________________

We have been informed that ________________ (hereinafter called “the Contractor”) has entered into Contract No. ________________ dated __________ with you, for the execution of ________________ (hereinafter called “the Contract”).

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Contractor, we ________________ hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of ________________ (___), upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall be reduced by half upon our receipt of:

(a) a copy of the Operational Acceptance Certificate; or
(b) a registered letter from the Contractor (i) attaching a copy of its notice requesting issuance of the Operational Acceptance Certificate and (ii) stating that the project manager has failed to issue such Certificate within the time required or provide in writing justifiable reasons why such Certificate has not been issued, so that Operational Acceptance is deemed to have occurred.

This guarantee shall expire no later than the earlier of: \(^\text{16}\)

(a) twelve months after our receipt of either (a) or (b) above; or
(b) eighteen months after our receipt of:

(i) a copy of the Completion Certificate; or

---

\(^{14}\) The Employer should insert either the Bank Guarantee (4.1) or the Conditional Guarantee (4.2).

\(^{15}\) The Guarantor shall insert an amount representing the percentage of the Contract Price specified in the Contract and denominated either in the currency(ies) of the Contract or a freely convertible currency acceptable to the Employer.

\(^{16}\) This text shall be revised as and where necessary to take into account (i) partial acceptance of the Facilities in accordance with Sub-Clause 25.4 of the GCC; and (ii) extension of the performance security when the Contractor is liable for an extended warranty obligation pursuant to Sub-Clause 27.10 of the GCC (although in this latter case the Employer might want to consider an extended warranty security in lieu of the extension of the performance security).
(ii) a registered letter from the Contractor, attaching a copy of the notice to the project manager that the Facilities are ready for commissioning, and stating that fourteen days have elapsed from receipt of such notice (or seven days have elapsed if the notice was a repeated notice) and the project manager has failed to issue a Completion Certificate or inform the Contractor in writing of any defects or deficiencies; or

(iii) a registered letter from the Contractor stating that no Completion Certificate has been issued but the Employer is making use of the Facilities; or

(c) the ____ day of _____, 2____.\(^{17}\)

Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded.

[signature(s)]

\(^{17}\) Insert the date twenty-eight days after the expected expiration date of the Defect Liability Period. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: “The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Employer’s written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.”
Performance Security Form- Conditional Bank Guarantee

(Not Applicable)

Date: __________________________

Loan/Credit N°: __________________

IFB N°: _________________________

To: ___________________________________

Dear Ladies and/or Gentlemen,

We refer to the Contract Agreement (“the Contract”) signed on [date] between you and __________________________ (“the Contractor”) concerning design, execution and completion of __________________________.

By this letter we, the undersigned, [name of Bank], a Bank (or company) organized under the laws of ___________ and having its registered/principal office at ____________, do hereby jointly and severally with the Contractor irrevocably guarantee payment owed to you by the Contractor, pursuant to the Contract, up to the sum of ___________, equivalent to __________ percent (%) of the Contract Price until the date of the Operational Acceptance Certificate and thereafter up to a sum of ___________, equivalent to __________ percent (%) of the Contract Price, until twelve (12) months after the date of Operational Acceptance, or eighteen (18) months after Completion of the Facilities, whichever comes first.

Where it is agreed between you and the Contractor that the Facilities are to be accepted in parts, and thus where there are separate Completion and Operational Acceptance Certificates for each part, this Letter of Guarantee shall be apportioned to the value of each such part and shall reduce or expire as provided above on or following Completion or Operational Acceptance of each part.

We shall only undertake to make payment under this Letter of Guarantee upon our receipt of a written demand signed by your duly authorized officer for a specified sum, where such demand sets out the reasons for your claim under this Letter of Guarantee and is accompanied by

(a) a copy of the written notice sent by you to the Contractor before making the claim under this Guarantee, specifying the Contractor’s breach of contract and requesting the Contractor to remedy it

(b) a letter signed by your duly authorized officer certifying that the Contractor has failed to remedy the default within the period allowed for remedial action

(c) a copy of your written notice to the Contractor stating your intent to claim under this Letter of Guarantee because of the Contractor’s failure to remedy the default in accordance with the request referred to in para. (a) above.

Our liability under this Letter of Guarantee shall be to pay to you whichever is the lesser of the sum so requested or the amount then guaranteed hereunder in respect of any demand duly made
hereunder prior to expiry of this Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This Letter of Guarantee shall be valid from the date of issue until the earlier of twelve (12) months after the date of Operational Acceptance or eighteen (18) months after the date of Completion of the Facilities or, where the Facilities are to be accepted in parts, twelve (12) months after the date of Operational Acceptance or eighteen (18) months after the date of Completion of the last part or [date], whichever comes first.

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

If the Defect Liability Period is extended with respect to any part of the Facilities in accordance with the Contract, you shall notify us, and the validity of this Letter of Guarantee shall be extended with respect to the percentage of the Contract Price stipulated in the notification until expiry of such extended Defect Liability Period.

Our liability under this Letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to you shall equal the sums guaranteed hereunder, whichever is the earlier.

All notices to be given hereunder shall be given by registered (airmail) post to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Contractor, and this security may be exchanged or surrendered without in any way impairing or affecting our liabilities hereunder without notice to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be increased or decreased.

No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may have to apply such law, so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

Yours truly,

Authorized Signature
Bank Guarantee Form for Advance Payment

Beneficiary: __________________________

Date: __________________________

ADVANCE PAYMENT GUARANTEE No.: __________________________

We have been informed that __________________________ (hereinafter called “the Contractor”) has entered into Contract No. ___________________ dated ______________ with you, for the execution of __________________________ (hereinafter called “the Contract”).

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum of ______________ (______________________) is to be made against an advance payment guarantee.

At the request of the Contractor, we __________________________ hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of ______________ (______________________) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor used the advance payment for purposes other than toward the execution of the Works.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on his account number ______________ at __________________________.

The maximum amount of this guarantee is valid shall be progressively reduced in proportion to the value of each part-shipment or part-delivery of plant and equipment to the site, as indicated in copies of the relevant shipping and delivery documents that shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of documentation indicating full repayment by the Contractor of the amount of the advance payment or on the ___ day of _______, 2___, whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

[signature(s) name of bank or financial institution]

18 Insert the expected expiration date of the Time for Completion. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: “The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Employer’s written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.”
SAMPLE FORMAT
Invitation for Bids

COUNTRY: NEPAL

NAME OF PROJECT: BUILDING RESILIENCE TO CLIMATE RELATED HAZARDS (BRCH)

Loan No./ Grant No.:T 013557

Grant No.TF 013665

Contract Title: Weather RADAR for Detection of Heavy Precipitation and other Meteorological Phenomenon.

Reference No.: PPCR/DHM/G/ICB-29

1. The Government of Nepal has received financing from the World Bank toward the cost of the Building Resilience to Climate Related Hazards Project (BRCH Project) and intends to apply part of the proceeds toward payments under the contract 19 for Weather RADAR for Detection of Heavy Precipitation and other Meteorological Phenomenon.

2. The Department of Hydrology and Meteorology now invites sealed bids from eligible bidders for: Design, Supply, Installation and Commissioning Weather RADAR at Surkhet.

3. Bidding will be conducted through the International Competitive Bidding procedures as specified in the World Bank’s Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits &Grants by World Bank Borrowers, January 2011, and is open to all eligible bidders as defined in the Procurement Guidelines. In addition, please refer to paragraphs 1.6 and 1.7 setting forth the World Bank’s policy on conflict of interest.

4. Interested eligible bidders may obtain further information from the address mentioned under clause (10) below and inspect the bidding documents during office hours 10:00 to17:00 hours at the address given below 12. A complete set of bidding documents in English may be purchased by interested eligible bidders upon the submission of a written application to the address below and upon payment of a nonrefundable fee20 of NPR Ten thousand (NPR 10,000) or equivalent. The method of payment will be direct deposit to specified account number*. The document may be sent by airmail for overseas delivery and surface mail or courier for local delivery provided if additional separate payment of NPR 12,000 or equivalent is deposited at xxx account number* and information to the effect is received in time. The Department of Hydrology and Meteorology shall not be held

---

19 Substitute “contracts” where bids are called concurrently for multiple contracts. Add a new para. 3 and renumber paras 3 - 8 as follows: “Bidders may bid for one or several contracts, as further defined in the bidding document. Bidders wishing to offer discounts in case they are awarded more than one contract will be allowed to do so, provided those discounts are included in the Letter of Bid.”

20 The fee chargeable should only be nominal to defray reproduction and mailing costs. An amount between US$50 and US$300 or equivalent is deemed appropriate.

21 For example, cashier’s check, direct deposit to specified account number, etc.
responsible/accountable for any event of delay or non-delivery of document, whatsoever the cause thereof.

6. Bids must be delivered to the address below on or before 12.00 Hrs (NST) on 15-09-2016. Electronic bidding will be permitted. Late bids will be rejected. Bids will be publicly opened in the presence of the bidders’ designated representatives and anyone who choose to attend at the address below on 13.00 Hrs (NST) on 15-09-2016. Bid must be valid for a period of 120 days counting from the day of bid opening.

7. If the last date of purchasing, submission and opening falls on a government holiday then the next working day shall be considered the last day. In such a case the bid validity and bid security validity shall be recognized with effect from the original bid submission deadline.

8. All bids must be accompanied by a Bid Security of NPR 7,020,000 (Seven million and Twenty thousand Only or equivalent freely convertible currency). This shall be valid for minimum 30 days beyond the bid validity period.

9. The Bid, as well as all correspondence and documents relating to the bid submitted by the Bidder shall be written in the English language.

   A Pre-bid meeting shall be held at Purchaser’s address below on date 15 – 08 - 2016 in order to clarify any issues or information related to bid.

10. The Employer reserves the right to accept or reject, wholly or partly any or all the bids without assigning reason, whatsoever.

11. The address (es) referred to above is(are):

   Department of Hydrology and Meteorology
   Building Resilience to Climate Related Hazards Project
   Project Management Unit,
   Attn: Mr. Shiva Nepal, chief, Procurement Unit,
   BRCH Project, Nagpokhari, Naxal
   Kathmandu, Nepal
   Tel: +977-1-4433563/4436272 Fax: E-mail: ppcr.brch@dhm.gov.np

---

22 Substitute the address for bid submission if it is different from address for inquiry and issuance of bidding documents.
Appendix 9

Environmental Management Action Plan (EMAP) For Radar Establishment at Ratanagla, Nalakhola Community Forest, Birendra Nagar-24, Surkhet
# EMAP for RADAR Establishment

<table>
<thead>
<tr>
<th>Activity / Environmental Risks / Issues</th>
<th>Impacts</th>
<th>Beneficial Impacts Enhancement Measures</th>
<th>Monitoring Methods</th>
<th>Responsible Implementing Agency</th>
<th>Responsible Monitoring Agency</th>
<th>Associated Costs &amp; its provision</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>During Construction Stage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment of Labours</td>
<td>Opportunities for increased income generation and employment</td>
<td>– Wherever applicable, use local labors for construction activities&lt;br&gt;– Give maximum priority to employ local labors and other manpower first priority for work, with gender equality&lt;br&gt;– Full payment of wages to worker not less than the District Rate.</td>
<td>– Inspect &amp; confirm labour employment related clauses are adequately stated/incorporated in Contractor’s Contract Document&lt;br&gt;– Site inspection &amp; labour interview&lt;br&gt;– Verify with contractors payroll /log books</td>
<td>Contractor and Sub Contractor</td>
<td>Project</td>
<td>No cost</td>
</tr>
<tr>
<td>Knowledge about the Local Weather</td>
<td>Improvement of Technical Knowledge of Local People</td>
<td>– Project shall provide the Knowledge about the climate and weather to the local peoples&lt;br&gt;– Local will know about the weather and disasters caused by the Climate through the Project operation</td>
<td>– Inspect Project’s Plans on improving social awareness&lt;br&gt;– Interactions with representatives of local communities</td>
<td>Half yearly DHM</td>
<td>DHM</td>
<td>No cost</td>
</tr>
<tr>
<td><strong>During Operation and Maintenance Stage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment to the local people</td>
<td>Employment to the local people as security personnel</td>
<td>– The local people will be hired for construction as well as for the Operation period also</td>
<td>–</td>
<td>DHM</td>
<td>DHM</td>
<td>This has been proposed by local people</td>
</tr>
<tr>
<td>Operation of Weather RADAR</td>
<td>Improved Weather Services and Climate data, information system Facility</td>
<td>– Provide the accurate weather&lt;br&gt;– Provide information for the potential disaster&lt;br&gt;– Proper and scientific information about the Weather and Climate Useful for the various measures of Agriculture, disasters and many more safety measures of the people</td>
<td>– Interact with local people using service&lt;br&gt;– Regular Operation of RADAR</td>
<td>Periodically during operation DHM</td>
<td>DHM</td>
<td>No additional costs associated</td>
</tr>
</tbody>
</table>

### Activity / Environmental Risks / Issues

**On Socio-economic and Cultural Environment During Construction Stage**
<table>
<thead>
<tr>
<th>Activity / Environmental Risks / Issues</th>
<th>Impacts</th>
<th>Adverse Impacts Mitigation Measures</th>
<th>Monitoring Methods</th>
<th>Monitoring Schedule and Location</th>
<th>Responsible Implementing Agency</th>
<th>Responsible Monitoring Agency</th>
<th>Associated Costs &amp; its provision</th>
</tr>
</thead>
</table>
| Clearance from the concern Authority   | Clearance for RADAR Establishment |  - Approval letter from the Ministry of Information and Technology regarding the establishment  
  - Approval from the radiation safety  
  - Approval from the CAAN | Letter of Approval | Pre-Construction Stage | DHM | DHM | No Cost |
| Clearing of Sites for construction works | Loss of 8 Trees and shifting of few electric Poles running adjacent to the Radar site |  - Compensation shall be provided to the affected areas and approval from the concern authority  
  - Relocate the Transmission Line together with electric poles near to the site | Get permission/clearance from the Distribution Consumer’s Service (DCS) , NEA for relocating the poles before the construction work commences | Pre-Construction Stage  
  Preconstruction stage  
  Pre-Construction Stage | DHM  
  DHM/Regional office  
  DHM | DHM/Regional office  
  DHM/Regional office | Budget is allocated for compensation |
| Workers living in the construction site | Probability of social conflicts and social pollution due to influx of construction workers |  - Employ local labours to the extent possible  
  - Orientation to labours on importance of maintaining social harmony  
  - Close vigilance of labours in labour camps if established  
  - Prepare a “labors Code of Conduct”, approve it from Project and Strictly enforce the “code of conduct” at work site and labor camp |  - Verify Contractor’s records of labours employed  
  - Verify Contractor’s enforcing strict rules as per “code of conduct”  
  - Interview with local residents on labours’ habits | Half yearly during construction period at Camp sites | Contractor, Local Peoples | DHM | No additional costs associated |
| Establishment of Work Camps | Likely adverse impacts to local community and environment due to establishment |  - If so required,Identify labour camp site such that it does not affect the people residing around the site  
  - Prepare a “Code of Conduct” to be enforced inside labour camp sites and include them in Contractor's Contract Document  
  - Provision water and latrines for site workers |  - Inspect work camp site proposed by Contractor  
  - Interview with local nearby residents of work camp site | Pre-Construction Stage | Contractor | Project | No additional costs associated |
### Activity / Environmental Risks / Issues

<table>
<thead>
<tr>
<th>Activity / Environmental Risks / Issues</th>
<th>Impacts</th>
<th>Adverse Impacts Mitigation Measures</th>
<th>Monitoring Methods</th>
<th>Monitoring Schedule and Location</th>
<th>Responsible Implementing Agency</th>
<th>Responsible Monitoring Agency</th>
<th>Associated Costs &amp; its provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>of Work Camps</td>
<td></td>
<td>- Provide adequate compensation to private land owners for renting their land&lt;br&gt;- Reinstall land to original condition after completion of works</td>
<td>- Inspect &amp; confirm&lt;br&gt;- labour related clauses are adequately stated in Contractor’s Contract Document&lt;br&gt;- Inspect records kept by Contractor&lt;br&gt;- Inspect use of safety gears by workers at site&lt;br&gt;- Interview site workers on the provisions made</td>
<td>Half yearly during construction period</td>
<td>Contractor</td>
<td>DHM</td>
<td>Budget is allocated for Personal Protective Equipment (PPE) and First aid Kits</td>
</tr>
<tr>
<td>Workers living in the construction site</td>
<td>Occupational health and safety issues</td>
<td>- Erect danger signs and signals on the hazardous area&lt;br&gt;- Provide workers with safety gears (helmets, Belts, boots, gloves, masks, goggles, earplugs and reflector jackets etc)&lt;br&gt;- Orientation and training shall be provided to workers on safety measures and work procedures prior to their dispatch to possible dangerous sites&lt;br&gt;- Provide accident insurance for workforce&lt;br&gt;- Study of presence of any local communicable disease from locals to outside workers and immunize labors from outside the area before employing them</td>
<td>- Inspect &amp; confirm&lt;br&gt;- labour related clauses are adequately stated in Contractor’s Contract Document&lt;br&gt;- Inspect records kept by Contractor&lt;br&gt;- Inspect use of safety gears by workers at site&lt;br&gt;- Interview site workers on the provisions made</td>
<td>Pre-Construction Stage and construction stage</td>
<td>Contractor</td>
<td>Project</td>
<td>Contractors work</td>
</tr>
<tr>
<td>Lack of work opportunity to women and issues regarding child labor</td>
<td>Gender involvement and child labor during construction</td>
<td>- Give equal priority to the women while hiring the workers</td>
<td>- Inspect &amp; confirm gender related clauses are adequately stated in Contractor’s Contract Document&lt;br&gt;- Inspect the child labors involve in the work&lt;br&gt;- Interview site workers regarding their age</td>
<td>Construction Stage</td>
<td>Contractor</td>
<td>Project</td>
<td></td>
</tr>
<tr>
<td>Possibility of conflicts between construction workers and locals</td>
<td>Impact due to unsocial activities due to outside workers</td>
<td>- Appropriate preventive mitigation measures will be applied to reduce and avoid unsocial activities&lt;br&gt;- Awareness raising to control such activities&lt;br&gt;- Monitoring of such activities on daily bases</td>
<td>- Inspect the construction site&lt;br&gt;- Establish labor camps far from the settlement area</td>
<td>Construction Stage</td>
<td>Contractor</td>
<td>Project</td>
<td></td>
</tr>
</tbody>
</table>

### On Socio-economic and Cultural Environment During Operation and Maintenance Stage

<p>| Impacts on Air Traffic due to the RADAR Tower | Possibility of Air traffic hazards and issues related to Aviation safety for the Weather | Informed the CAAN Officials in written form about the Height of the Tower and potential routes for the aviation and document&lt;br&gt;- Inform the Surkhet airport on the installation of the Radar&lt;br&gt;- Discuss with CAAN on the type of mitigation measures to be taken&lt;br&gt;- Install marking color balls along the standing ropes of the Tower | - Inspect proper colour ball installation and safety devices are installed&lt;br&gt;- Verify that enough danger and precautionary&lt;br&gt;- Routine monitoring with association with CAAN | Contractor and DHM | Project/DHM | Budget is allocated for installing safety signs and balls |</p>
<table>
<thead>
<tr>
<th>Activity / Environmental Risks / Issues</th>
<th>Impacts</th>
<th>Adverse Impacts Mitigation Measures</th>
<th>Monitoring Methods</th>
<th>Monitoring Schedule and Location</th>
<th>Responsible Implementing Agency</th>
<th>Responsible Monitoring Agency</th>
<th>Associated Costs &amp; its provision</th>
</tr>
</thead>
</table>
| RADAR Tower                            | marking & its timely re-marking when its worn out & invisible by others.  
  − Conduct an information workshop to the air navigation stakeholders of the regions about Radar Tower | signs/symbols are erected  
  − Verify conduction of workshops with the navigation stakeholders  
  − Accident records from the CAAN | and other related Airlines | operation |
| Employment Employment Opportunity      | Give the Employment Opportunity for the local peoples during the operation | Inspect and interview the local peoples and employee | Annually | DHM | No Cost |
| **Physical Environment**  
**During Construction Stage** | | | | |
| Construction Activities, use of machineries etc. | Air and Noise Pollution and Vibration Effect  
  − Ensure good construction practice by the Contractor  
  − Indicate air, water, noise and vibration limits in Contractor’s Contract Document  
  − Prohibit open storage and spillage of loose soil in and around construction site  
  − Appropriately cover or wet the stock piled and spoil materials if it gives rise to dust pollution  
  − Use of face masks to the construction workers in dust prone areas such as crushing plants, excavation sites etc. | Inspect & confirm related safeguard clauses are adequately stated in Contractor’s Contract Document  
  − Site inspection to inspect Contractor’s construction practice during implementation | Pre-construction on annual and Monthly basis during construction stage at construction site  
  − Site inspection to inspect Contractor’s construction practice during implementation | Contracto r  
  − Project, Regional office, DHM | Budget is allocated |
| | Material extracting Possible impacts due to quarrying materials  
  − Restricted to small areas, on sites without trees cover – and located away from cultivable lands and settlements, drinking water intakes  
  − Areas where it will not result slope instability, erosion, disruption of natural drainages, changes in river regimes, river bank cutting, destruction of vegetation, damage of farmland and other physical resources | Verify soundness of quarry site  
  − Verify non-excessive extraction from same site  
  − Verify appropriate decommissioning of extraction site | During construction period and after completion | Contracto r  
  − Project/DHM regional office | Part of civil construction works, No additional costs associated |
### Stockpiling of construction materials

**Possible impacts due to stockpiling of construction materials to nearby residents or natural environment**

- Avoid stockpiling site near cultivable lands and settlements, drinking water intakes, public places, near school, health centres, forest area, sensitive ecosystem, fragile and landslide prone slope or terraces etc. and where natural drainage will be disrupted.
- Site should be cleaned and brought to original condition after closure and removal of the stockpile.

**Adverse Impacts Mitigation Measures**

- Inspect material stockpiling plan made by Contractor
- Interview local people about nuisance caused by material storing or quarrying
- Inspect site after completion of works

**Monitoring Methods**

- Pre-Construction Stage, during construction at stockpiling sites and at project completion

**Monitoring Schedule and Location**

- Pre-construction

**Responsible Implementing Agency**

- Contractor

**Responsible Monitoring Agency**

- Project

**Associated Costs & its provision**

- Part of civil construction works, no additional costs associated.

---

### Disposal of spoils and construction debris and waste

**Possible impacts due to spoil disposal**

- Avoid disposal on:
  - Natural water course posing a threat of or causing choking in its flow and course change
  - Immediately above potential arable land and forest areas
  - Above public utilities and existing services – water supply lines, irrigation canal systems, valley side trails etc.
  - Above local settlements' physical structures, especially house
  - On fresh unstable slopes

  Spoil disposal should be prioritized on:
  - On undulated and low, flat plains
  - Site requiring landfills, especially local play ground, community ground, re-claimed land from rivers, etc.
  - Site requiring value adding landfills, especially reclaiming land for building constructions
  - Broad flat land on the ridge and depressions spread over large areas

**Adverse Impacts Mitigation Measures**

- Inspect spoil disposal plan made by Contractor
- Inspect sites of spoil disposal and its rehabilitation

**Monitoring Methods**

- Pre-Construction Stage and during construction up to the end of the project

**Monitoring Schedule and Location**

- Pre-construction

**Responsible Implementing Agency**

- Contractor

**Responsible Monitoring Agency**

- Project

**Associated Costs & its provision**

- Part of civil construction works, no additional costs associated.

---

### Slope cutting and Drainage Management

**Slope instability, landslides and erosion and drainage management**

- Slope protection measures in and around the site
- Plantation if needed and physical measures for the drainage management
- Civil structures like drains, gabion / retaining wall to be provided as required to protect the foundation of the radar structure

**Adverse Impacts Mitigation Measures**

- Verify effectiveness of these measures post-rainy season

**Monitoring Methods**

- Pre-construction, immediately after construction

**Monitoring Schedule and Location**

- Pre-construction

**Responsible Implementing Agency**

- Contractor

**Responsible Monitoring Agency**

- Project

**Associated Costs & its provision**

- Included in civil works.

---

### During Operation and Maintenance Stage

**Physical Environment**
<table>
<thead>
<tr>
<th>Activity / Environmental Risks / Issues</th>
<th>Impacts</th>
<th>Adverse Impacts Mitigation Measures</th>
<th>Monitoring Methods</th>
<th>Monitoring Schedule and Location</th>
<th>Responsible Implementing Agency</th>
<th>Responsible Monitoring Agency</th>
<th>Associated Costs &amp; its provision</th>
</tr>
</thead>
</table>
| Weather RADAR Tower with height 30m    | Impacts on Aviation and Air Traffic | – Installed colour balls on the angles rope and in towers also  
– Conduct the information workshop with the aviation peoples of that region | – Inspection and Observation  
– Consultation with the aviation peoples | -Half yearly  
once | Contractor  
DHM/CAA | DHM  
DHM | Budget have been allocated and included in CIVIL works |
| Operation of the Weather RADAR         | Radiation Hazards                   | – Identify the impacts and disseminate it to the local peoples  
– Conduct the consultation and disseminate the information  
– Identify the Buffer Area for the potential impacts and restrict the area for human activities | – Inspection | During construction and operation | DHM  
DHM  
DHM | | |
| **Biological Environment During Construction Stage** | | | | | | |
| Clearing of site                       | Loss of forests                      | – 8X25= 200 Nos. of compensatory plantation will be done, by adopting the following steps:  
– Prepare elaborate Action Plan (for cutting of trees, its management, compensatory plantation at 1:25 ratio, establishment of nurseries etc.) in consultation with concerned authorities (CFUG, DOF, DFO)  
– Obtain approval from authorized agency for cutting of the trees  
– Implement the Action Plan jointly by CFUG, DFO  
– and other agencies as per the approved Action Plan as per existing rules and regulations | – Inspect forest clearing and its management methods carried out  
– Verify that all necessary regulations have been adopted  
– Inspect plan for compensatory plantation and available area, along with its management plans | Pre-construction and construction stage at Naikhola Community Forest  
Project, CFUG, DFO  
Project / DFO/DHM regional office | Project, CFUG, DFO  
Project / DFO/DHM regional office | Budget has been allocated for the plantation and caring of them (NRs 2000000.00) |
| Possible disturbance to wildlife        | Disturbance to wildlife by the construction activities | – Disturbance to wildlife and its habitat by the construction works should be avoided as far as possible  
– Contractors should ensure to avoid disturbance to wildlife by the construction workers | – Verify that all necessary regulations have been adopted | Construction stage | Project, CFUG, DFO  
Project / DFO/DHM regional office | Project, CFUG, DFO  
Project / DFO/DHM regional office | No additional costs associated |
| Impact on the wildlife and the forest resources | Impact due to wildlife poaching, illegal tree felling and fire hazards | – Contractor’s document have included provisions to restrict work forces with regard to forest product and wildlife collection and trade  
– Collection of non-timber forest products by the work staff should be prohibited | – Verify that all necessary regulations have been adopted | Construction and operation stage | Project, CFUG, DFO  
Project / DFO/DHM regional office | Project, CFUG, DFO  
Project / DFO/DHM regional office | No additional costs associated |
<table>
<thead>
<tr>
<th>Activity / Environmental Risks / Issues</th>
<th>Impacts</th>
<th>Adverse Impacts Mitigation Measures</th>
<th>Monitoring Methods</th>
<th>Monitoring Schedule and Location</th>
<th>Responsible Implementing Agency</th>
<th>Responsible Monitoring Agency</th>
<th>Associated Costs &amp; its provision</th>
</tr>
</thead>
</table>
| Misuse of forest resources by Labours  | Pressure on forests for fuel wood in labor camps | – The project management should instruct the project officials, labor force, contractors, consultants and other stakeholder not to indulge in such activities  
– Ensure strict penalty and fines for illegal activities  
– Effective patrolling and surveillance from CFUG  
– Establish security check-posts at proper locations  
– Educate and create awareness among local people  
– Contractor to provide kerosene to its labours and prohibit use of wood collected from nearby forests  
– Contractor not to use wood from nearby forest for bitumen heating purpose | – Verify number of labours residing in camp and the physical facilities including fuel used in the camp by the Contractor  
– Interview local residents about labours behaviours | During construction period, twice yearly | Contractor | Project, CFUG | No additional costs associated |
| Biological Environment During Operation Stage | | | | | | | |
| Encroachment of forest area | Encroachment into forest areas for commercial logging, settlements | – Encouragement to local communities and authorities in controlling illegal harvesting of forest resources  
– Strict rules and regulation should be enforced in and around the project area to protect from illegal harvesting of the vegetation and wildlife | – Inspection for felling of trees | During construction and operation | Project, CFUG, DFO | Project / DHM/DFO/CFUGS | No additional costs associated |
<p>| Plantation in and around the site and Maintenance | | – Protection of the site from erosion and landslide | – Inspection | Operation | DHM | DHM?CFUGs | DHM will provide |
| Chemical Environment During Construction Stage | | | | | | | |</p>
<table>
<thead>
<tr>
<th>Activity / Environmental Risks / Issues</th>
<th>Impacts</th>
<th>Adverse Impacts Mitigation Measures</th>
<th>Monitoring Methods</th>
<th>Monitoring Schedule and Location</th>
<th>Responsible Implementing Agency</th>
<th>Responsible Monitoring Agency</th>
<th>Associated Costs &amp; its provision</th>
</tr>
</thead>
</table>
| Use of Chemicals and their storage     | Possible impacts due to use of certain chemicals | - It is recommended not to use the unnecessary chemicals during the construction.  
- If use Adequate care in storing and handling of such chemicals  
- Protective clothing, gloves, boots etc. should be provided to the laborers  
- Should follow the Hazardous Waste Management Guidelines of the DHM  | - Verify the chemicals use during the construction and operation  
- Interview local residents on impacts due to chemicals | During construction | Contractor | Project/DHM | No additional costs associated |
| Issue of Fuel Storage during Operation | Possible impacts due to fuel storage | - Safely Storage of the Fuel required for the operation. Standard safety measures including firefighting devices has to be incorporated  
- Strictly monitor the fuel tank either for leakage and ready for associated precautions  
- Far from the RADAR and settlement site  
- Avoid/ Minimize the potential risk from the leakage and other | - Observation and Inspection | During Operation and Construction | DHM/Contractor | DHM | No cost |