



BIDDING DOCUMENTS

TENDER NO: ZPPA//ORD/037/12

**TENDER FOR THE SUPPLY, DELIVERY, INSTALLATION AND
COMMISSIONING OF A NATIONAL DIGITAL TERRESTRIAL
TELEVISION BROADCASTING SYSTEM IN ZAMBIA**

MINISTRY OF INFORMATION AND BROACATING SERVICES

Financing Agency: Government of the Republic of Zambia

Zambia Public Procurement Authority,
Red Cross House, Ground Floor,
P.O. Box 31009,
Lusaka.

Tel: 260-1-250632

September, 2012



GOVERNMENT OF THE REPUBLIC OF ZAMBIA

ZAMBIA PUBLIC PROCUREMENT AUTHORITY

INVITATION FOR BIDS

ZPPA/ORD/037/12: TENDER FOR THE SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF A NATIONAL DIGITAL TERRESTRIAL TELEVISION BROADCASTING SYSTEM IN ZAMBIA

The Ministry of Information and Broadcasting has set aside funds for the cost of implementing the national digital terrestrial television broadcasting system in Zambia. It is intended that part of the funds will be applied to eligible payments under the contract for which this invitation for bids has been issued.

The Zambia Public Procurement Authority, on behalf of the Ministry of Information and Broadcasting, now invites sealed bids from eligible bidders for the supply, delivery, installation and commissioning of a National Digital Terrestrial Television Broadcasting system in Zambia. International competitive bidding method will be used for this procurement.

Interested eligible bidders may obtain further information and inspect the bidding document at the Zambia Public Procurement Authority, Room 6, Red Cross House, Los Angeles Boulevard, P.O. Box 31009, LUSAKA, ZAMBIA. The telephone numbers are 260-1-250632/250642 and the telefax number is 260-1-250633. **HOWEVER TELEGRAPHIC AND/OR ELECTRONIC OFFERS WILL NOT BE ACCEPTED.** The tender document can also be accessed on the Zambia Public Procurement Authority website: www.ppa.org.zm

A complete set of bidding documents should be purchased by interested bidders upon submission of a written application and upon payment of a non-refundable fee of **K1, 000,000.00** or its equivalent in any freely convertible currency.

The bids must be sent clearly marked: **“ZPPA/ORD/037/12 - Tender for the supply, delivery, installation and commissioning of a National Digital Terrestrial Television Broadcasting system”**, addressed to the Director-General, Zambia Public Procurement Authority, and not sent later than **Friday, 19th October 2012 at 14:00 hours**.

The bids must be appropriately bound, sealed, labeled and must be deposited in the tender box at Zambia Public Procurement Authority, 2nd Floor, Red Cross House, Los Angeles Boulevard, Lusaka, on or before **Friday, 19th October 2012 at 14:00 hours** local time and must be accompanied by a bid security of not less than **K1, 000,000,000.00** of the total bid sum, duly signed and sealed by the Guarantor (s).

The closing date for the receipt of bids is **Friday, 19th October 2012 at 14:00 hours** local time. The bids will be opened in the Conference Room at the Zambia Public Procurement Authority, 2nd Floor, Red Cross House, Los Angeles Boulevard, Lusaka, Zambia, on the same date soon after closing in the presence of all bidders or their representatives who choose to attend. **LATE BIDS SHALL NOT BE ACCEPTED**

Danies K. Chisenda
Director General

ZAMBIA PUBLIC PROCUREMENT AUTHORITY

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PART 1 – Bidding Procedures

OPTION A: Single Stage Bidding

Section I. Instructions to Bidders

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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 Purchaser **indicated in the BDS** has set aside funds towards the cost of the project named in the BDS. The Purchaser intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.
- 3. Fraud and Corruption**
 - 3.1 The Purchaser requires that Bidders, Suppliers, Contractors and their agents (whether declared or not), personnel, subcontractors, sub-consultants, service providers and suppliers, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuit of this policy, the Purchaser:
 - (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 party¹;
 - (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

¹ "Another party" refers to a public official acting in relation to the procurement process or contract execution. In this context, "public official" includes Purchaser staff and employees of other organizations taking or reviewing procurement decisions.

obligation²;

- (iii) “collusive practice” is an arrangement between two or more parties³ 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 party⁴ 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 Purchaser 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 Purchaser’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 contract if it determines at any time that representatives of the Supplier or of a beneficiary of the Contract engaged in corrupt, fraudulent, collusive, or coercive practices during the procurement or the execution of that contract, without having taken timely and appropriate action satisfactory

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.

to the Purchaser to remedy the situation; and

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

3.2 In further pursuance of this policy, Bidders shall permit the Purchaser 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 Purchaser.

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

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

^a A firm or an individual may be declared ineligible to be awarded a contract upon completion of the Purchaser'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.

^b 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 Purchaser.

Contract, during contract execution.

- 4.2 A Bidder, and all partners constituting the Bidder, shall have a nationality of an eligible country as defined by the Zambia Public Procurement Authority (ZPPA), 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 Purchaser

as Project Manager for the contract.

- 4.4 A Bidder that has been sanctioned by the Purchaser accordance with the above ITB 3.1 (d), or in accordance with the ZPPA's Guidelines on Preventing and Combating Corruption, shall be ineligible to be awarded a contract, or benefit from a Purchaser-financed contract, financially or otherwise, during such period of time as the Purchaser shall determine.
- 4.5 Government-owned entities in the Purchaser'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 Purchaser.
- 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 Purchaser's country prohibits commercial relations with that country, provided that the Purchaser 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 Purchaser'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

- 7.1 A prospective Bidder requiring any clarification of the Bidding Document shall contact the Employer in writing at the

**Document, Site
Visit, Pre-Bid
Meeting**

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.
- 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 Installation Services**
- 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.
- 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 Purchaser 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 withdrawals 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. Nonmaterial
Nonconformities**

- 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 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	
ITB 1.1	The Employer is: Ministry of Information and Broadcasting Services
ITB 1.1	<p>The name of the ICB is: Tender for the Supply, Delivery, Installation and Commissioning of a National Digital Terrestrial Television System in Zambia</p> <p>The identification number of the ICB is: ZPPA/ORD/037/12</p> <p>The number and identification of lots this ICB is: Single lot</p>
ITB 2.1	The Purchaser is: Ministry of Information and Broadcasting Services
ITB 2.1	The name of the Project is: Zambia National Digital Migration
ITB 4.1 (a)	The individuals or firms in a joint venture, consortium or association shall be jointly and severally liable.
B. Bidding Document	
ITB 7.1	<p>For <u>clarification purposes</u> only, the Employer's address is:</p> <p>Attention: Manager – Central Tender Committee</p> <p>Street Address: Plot 2837, Los Angeles Boulevard</p> <p>Floor/Room number: Ground Floor</p> <p>City: Lusaka</p> <p>ZIP Code: 10101</p> <p>Country: Zambia</p> <p>Telephone: +260 21 1 250632/42</p> <p>Facsimile number: +260 21 1 250633</p> <p>Electronic mail address -tenders@ppa.org.zm</p>
ITB 7.2	<p>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. The key sites are Lusaka and Kitwe, Zambia National Broadcasting Corporation on dates that are convenient to bidders. The visit to these two key stations is mandatory and bidders will be requested to provide proof.</p>
ITB 7.4	<p>A Pre-Bid meeting will take place at the following date, time and place:</p> <p>Date: 26th September, 2012</p> <p>Time: 10:00hrs Local Time</p> <p>Place: Board Room, Ministry of Information and Broadcasting Services</p>

C. Preparation of Bids	
ITB 10.1	The language of the bid is: English
ITB 11.1 (k)	<p>The Bidder shall submit with its bid the following additional documents:</p> <ul style="list-style-type: none"> (a) Technical Specifications in accordance with applicable standards as specified in technical specifications table and other relevant international standards. (b) Audited Financial Statements for the last three years (c) Certificate of incorporation supported by articles of association (d) Evidence of adequate working capital for this contract (access to lines of credit and availability of other financial resources. (e) The bidder must have supplied similar television broadcasting equipment over the last five years, with a minimum of two (2) contracts similar in value and complexity to the proposed contract. (f) The Bidder who is not a manufacturer will be required to submit with the bid an original and authenticated manufacturer's authorization from the Manufacturer (no scanned copies will be accepted). If an agent submits bids on behalf of more than one manufacturer, unless each such bid is accompanied by a separate bid form for each bid and a separate bid security when required, for each bid, and authorization from the respective manufacturer, all such bids will be rejected as non responsive.
ITB 13.1	Alternative bids are not permitted.
ITB 13.2	Alternatives to the Time Schedule are not permitted.
ITB 13.4	Alternative technical solutions shall not be permitted for the following parts of the Plant and Installation Services:
ITB 17.1	Bidders shall quote for the entire components or services on a single responsibility basis (single lot).
ITB 17.5(a)	Named place of destination Port of entry: Lusaka.
ITB 17.5(d)	Named place of final destination is: All places named in Section VI
ITB 17.7	The prices quoted by the Bidder shall be CIP named place of destination as above and should be exclusive of duty and other local taxes. Incidental local services shall include handling services, delivery and other services contingent to the delivery of the equipment to the final destination. The prices shall be Fixed.

ITB 18.1	<p>The currency(ies) of the bid shall be as follows:</p> <ul style="list-style-type: none"> (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 accordingly, but use no more than three currencies from any country. (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.
ITB 19.1	The bid validity period shall be 120 days.
ITB 20.1	Bid shall include a bid security issued from a reputable commercial bank in the Purchaser's Country or the Bidder's country and the amount of the bid security shall be two (2) percent of the total bid sum in conformity with the sample form provided and its validity shall be 150 days.
ITB 20.3 (d)	Other types of acceptable securities: None
ITB 20.10	Not Applicable
ITB 21.1	In addition to the original of the bid, the number of copies is: Five (5)
ITB 21.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: Power of Attorney issued and signed by a legal practitioner
D. Submission and Opening of Bids	
ITB 22.1	Bidders will not have the option of submitting their bids electronically.
ITB 22.1 (b)	If bidders shall have the option of submitting their bids electronically, the electronic bidding submission procedures shall be: N/A
ITB 23.1	<p>For <u>bid submission purposes</u> only, the Employer's address is :</p> <p>Attention: Director General – Zambia Public Procurement Authority Street Address: Plot 2837, Los Angeles Boulevard Floor/Room number: 2nd Floor City: Lusaka ZIP Code: 10101 Country: Zambia</p>

	Telephone: +260 21 1 250632/42 Facsimile number: +260 21 1 250633 The deadline for bid submission is: Date: Friday, 19th October 2012 Time: 14:00hrs Local Time
ITB 26.1	The bid opening shall take place at: Street Address: Plot 2837, Los Angeles Boulevard Floor/Room number: 2nd Floor City: Lusaka Country: Zambia Date: Friday, 19th October 2012 Time: 14:00hrs Local Time
ITB 26.1	If electronic bid submission is permitted in accordance with ITB 22.1, the specific bid opening procedures shall be: Not Applicable
E. Evaluation and Comparison of Bids	
ITB 33.1	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: the Zambia Kwacha The source of exchange rate shall be: Bank of Zambia The date for the exchange rate shall be: Date of Bid Opening

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 shall be between **12 months minimum and 18 months maximum**. The adjustment rate in the event of completion beyond the minimum period shall be 0.5 % for each month of delay from that minimum period. No credit will be given for completion earlier than the minimum designated period. Bids offering a completion date beyond the maximum designated period shall be rejected.

(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: **ten (10) years**
- (ii) operating costs: all inputs, unit costs for annual and total operational requirements
- (iii) maintenance costs, including the cost of spare parts for the initial period of operation,
- (iv) rate, in percent, to be used to discount to present value all annual future costs calculated under (ii) and (iii) above for the period specified in (i): **8%**

(c) Functional Guarantees of the facilities

The minimum (or maximum) requirements stated in the Specification for functional guarantees required in the Specification are:

Functional Guarantee	Minimum (or Maximum, as appropriate) Requirement
1. Studio system	100% operational
2. signal distribution	100 % coverage
3. communication network	100% coverage
4. outside broadcasting	100% operational
5. performance	100%
6. system efficiency	100%
7. accuracy	100%

For the purposes of evaluation, for each percentage point that the functional guarantee of the proposed Plant and Installation Services is below the norm specified in the Specification and in the above table, but above the minimum acceptable levels also specified therein, an adjustment of **0.2%** will be added to the tender price. If the drop below the norm or the excess above the minimum acceptable levels is less than one percent, the adjustment will be prorated accordingly.

(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

The relevant evaluation method, if any, shall be as follows:

Preliminary Evaluation

- Certificate of Incorporation
- Valid Tax Clearance Certificate for Zambian firms
- Bid Form signed by person(s) duly authorized to do so by a Written Power of Attorney. The Power of Attorney must come from a legal practitioner representing the Bidder
- Bid validity period of at least 120 days from date of Tender Closing
- Bid Security – not less than 2% of the bid sum duly signed and sealed by the guarantors.
- Written Power of Attorney or Letter of authorization for the signatory to the Bid.
- Manufacturers Authorisation.
- Proof of bid security in the correct amount and format
- Bidders should quote for all the items making a lot. Bids quoting partial quantities will be deemed non-responsive
- Contradictions in model numbers or designations of critical importance will be deemed non-responsive
- Presence of joint venture agreement where applicable

Detailed Evaluation

- Satisfying the technical specifications provided in Section VI
- Warranty – twelve (12) months.
- Experience of having undertaken not less than two similar projects in the last five years. Bidders shall be required to provide a list of such works including names of institutions and contact details.
- Average turnover in the last three years should be not less than the total value of the bid under consideration
- Certified technical staff supported by signed curriculum vitae

Commercial Evaluation

- Cost - CIP to the respective sites

Any adjustments in price that result from the above procedures shall be added, for purposes of comparative evaluation only, to arrive at an “Evaluated Bid Price.” Bid prices quoted by bidders shall remain unaltered.

1.3 Technical alternatives

Technical alternatives, if invited in accordance with ITB 13.4, will be evaluated as follows: **Not Applicable**

2. Qualification

Factor	2.1 Eligibility					
Sub-Factor	Criteria					Documentation Required
	Requirement	Single Entity	Bidder			
			Joint Venture, Consortium or Association			
			All partners combined	Each partner	At least one partner	
2.1.1 Nationality	Nationality in accordance with ITB 4.2.	Must meet requirement	Existing or intended JVA must meet requirement	Must meet requirement	N / A	Form ELI –1.1 and 1.2, with attachments
2.1.2 Conflict of Interest	No- conflicts of interests as described in ITB 4.3.	Must meet requirement	Existing or intended JVA must meet requirement	Must meet requirement	N / A	Letter of Bid
2.1.3Ineligibility	Not having been declared ineligible by the Purchaser as described in ITB 4.4.	Must meet requirement	Existing JVA must meet requirement	Must meet requirement	N / A	Letter of Bid
2.1.4 Government Owned Entity	Compliance with conditions of ITB 4.5	Must meet requirement	Must meet requirement	Must meet requirement	N / A	Form ELI –1.1 and 1.2, with attachments
2.1.5 Ineligibility based on a United Nations resolution or Purchaser’s country law	Not having been excluded as a result of the Purchaser’s country laws or official regulations, or by an act of compliance with UN Security Council resolution, in accordance with ITB 4.8	Must meet requirement	Existing JVA must meet requirement	Must meet requirement	N / A	Letter of Bid

Factor	2.2 Historical Contract Non-Performance					
Sub-Factor	Criteria					Documentation Required
	Requirement	Bidder				
		Single Entity	Joint Venture, Consortium or Association			
			All partners combined	Each partner	At least one partner	
2.2.1 History of non-performing contracts	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.	Must meet requirement by itself or as partner to past or existing JVA	N / A	Must meet requirement by itself or as partner to past or existing JVA	N / A	Form CON - 2
2.2.2 Pending Litigation	All pending litigation shall in total not represent more than sixty percent (60%) of the Bidder’s net worth and shall be treated as resolved against the Bidder.	Must meet requirement by itself or as partner to past or existing JVA	N / A	Must meet requirement by itself or as partner to past or existing JVA	N / A	Form CON – 2

Factor	2.3 Financial Situation					
Sub-Factor	Criteria					Documentation Required
	Requirement	Bidder				
		Single Entity	Joint Venture, Consortium or Association			
	All partners combined		Each partner	At least one partner		
2.3.1 Historical Financial Performance	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 three (3) years to demonstrate the current soundness of the bidders financial position and its prospective long term profitability	Must meet requirement	N / A	Must meet requirement	N / A	Form FIN – 3.1 with attachments
2.3.2 Average Annual Turnover	Minimum average annual turnover of US\$40m , calculated as total certified payments received for contracts in progress or completed, within the last three (3) years	Must meet requirement	Must meet requirement	Must meet Fifty percent (50%) of the requirement	Must meet Thirty percent (30%) of the requirement	Form FIN –3.2

Factor	2.3 Financial Situation					
Sub-Factor	Criteria					Documentation Required
	Requirement	Bidder				
		Single Entity	Joint Venture, Consortium or Association			
	All partners combined		Each partner	At least one partner		
2.3.3 Financial Resources	<p>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:</p> <p>(i) the following cash-flow requirement: US\$5 per month and</p> <p>(ii) the overall cash flow requirements for this contract and its current commitments.</p>	Must meet requirement	Must meet requirement	Must meet Fifty percent (50%) of the requirement	Must meet Twenty percent (20%) of the requirement	Form FIN –3.3

Factor	2.4 Experience					
Sub-Factor	Criteria					Documentation Required
	Requirement	Bidder				
		Single Entity	Joint Venture, Consortium or Association			
			All partners combined	Each partner	At least one partner	
2.4.1 General Experience	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.	Must meet requirement	N / A	Must meet requirement	N / A	Form EXP-2.4.1
2.4.2 Specific Experience	(a) Participation as contractor, management contractor, or subcontractor, in at least two (2) contracts within the last _three (3) years , each with a value of at least US\$20, that have been successfully and substantially completed and that are similar to the proposed 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.	Must meet requirement	Must meet requirements for all characteristics	N / A	Must meet requirement for one characteristic	Form EXP 2.4.2(a)

Factor	2.4 Experience					
Sub-Factor	Criteria					Documentation Required
	Requirement	Bidder				
		Single Entity	Joint Venture, Consortium or Association			
			All partners combined	Each partner	At least one partner	
2.4.2 Specific Experience	(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: As per technical requirements	Must meet requirements	Must meet requirements	N / A	Must meet requirements	Form EXP-2.4.2(b)

2.5 Personnel

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

No.	Position	Total Work General Experience (years)	In Similar Works Experience – networks (years)
1	Project Manager	10	5 (3 in DTT)
2	Telecommunication Engineers	10	5 (3 in DTT)
3	ICT Engineer	10	5 (3 in DTT)
4	Network Engineer	10	5 (3 in DTT)
5	Studio Engineer	10	5 (3 in DTT)
6	Broadcasting Engineer	10	5 (3 in DTT)
7	Civil Engineer	7	5
8	Riggers	5	5

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:

No.	Equipment Type and Characteristics	Minimum Number required
1	4X4 Motor vehicles	2
2	Heavy Duty Trucks	2
3	Tipper truck	2
4	Containerized trucks for haulage of sensitive equipment	3
5	Power Metre with capacity to measure reflective power	2
6	cable continuity metres	2
7	Signal strength metres	2

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:

Item No.	Description of Item	Minimum Criteria to be met
1	Telecommunication towers	Five years similar experience
2	Transmission Equipment	Five years similar experience
3	Television Broadcast Studios	Five years similar experience

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.

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Letter of Bid

Letter of Bid – Single Stage Bidding

Date: _____

ICB No.: _____

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, including any of our subcontractors or manufacturers for any part of the contract, have not been declared ineligible by the Bank, under the Employer's country laws or official regulations or by an act of compliance with 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;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:

Name of Recipient	Address	Reason	Amount
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

(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 _____, _____

⁵ Bidder to use as appropriate

Schedules of Rates and Prices

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

Item	Description	Code ¹	Qty. (1)	Unit Price ²		Total Price ² (1) x (3)
				(2)	CIP (3)	
TOTAL (to Schedule No. 5. Grand Summary)						
			Name of Bidder _____ Signature of Bidder _____			

¹ Bidders shall enter a code representing the country of origin of all imported plant and equipment.

² Specify currency. Create and use as many columns for Unit Price and Total Price as there are currencies.

Country of Origin Declaration Form

Item	Description	Code	Country

Schedule No. 2. Plant and Mandatory Spare Parts Supplied from Within the Employer's Country

Item	Description	Qty. (1)	EXW Unit Price ¹ (2)	EXW Total Price ¹ (1) x (2)
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

Item	Description	Qty. (1)	Unit Price ¹		Total Price ¹ (1) x (2)
			Local Currency Portion (2)	Foreign Currency Portion (optional)	
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

Item	Description	Total Price ¹	
		Foreign	Local
	Total Schedule No. 1. Plant, and Mandatory Spare Parts Supplied from Abroad		
	Total Schedule No. 2. Plant, and Mandatory Spare Parts Supplied from Within the Employer's Country		
	Total Schedule No. 3. Design Services		
	Total Schedule No. 4. Installation and Other Services		
	TOTAL (to Bid Form)		
<div style="margin-top: 40px;">Name of Bidder _____</div> <div style="margin-top: 40px;">Signature of Bidder _____</div>			

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. Create and use as many columns for Foreign Currency requirement as there are foreign currencies

Schedule No. 6. Recommended Spare Parts

[illegible]

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

Method Statement

Mobilization Schedule

Construction Schedule

Plant

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.

Item of equipment		
Equipment information	Name of manufacturer	Model and power rating
	Capacity	Year of manufacture
Current status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

Omit the following information for equipment owned by the Bidder.

Owner	Name of owner	
	Address of owner	
	Telephone	Contact name and title
	Fax	Telex
Agreements	Details of rental / lease / manufacture agreements specific to the project	

Form FUNC

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.

Required Functional Guarantee	Value of Functional Guarantee of the Proposed Plant and Equipment
1.	
2.	
3.	
...	

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.

1.	Title of position*
	Name
2.	Title of position*
	Name
3.	Title of position*
	Name
4.	Title of position*
	Name

*As listed in Section III.

Resume of Proposed Personnel

Position		
Personnel information	Name	Date of birth
	Professional qualifications	
Present employment	Name of employer	
	Address of employer	
	Telephone	Contact (manager / personnel officer)
	Fax	E-mail
	Job title	Years with present employer

[illegible]

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

Major Items of Plant and Installation Services	Proposed Subcontractors/Manufacturers	Nationality

Others - Time Schedule

(to be used by Bidder when alternative Time for **Completion is invited in ITB 13.2 – Single Stage Bidding only**)

Others – Commercial or contractual aspects of the bidding documents that the Bidder would like to discuss with the Employer during clarifications (to be used by Bidder – Two Stage Bidding only)

Form ELI 1.1
Bidder Information Sheet

Date: _____

ICB No.: _____

Invitation for Bid No.: _____

Page _____ of _____ pages

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: <input type="checkbox"/> Articles of Incorporation or Registration of firm named in 1, above, in accordance with ITB Sub-Clauses 4.1 and 4.2. <input type="checkbox"/> 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. <input type="checkbox"/> 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: <input type="checkbox"/> Articles of Incorporation or Registration of firm named in 1, above, in accordance with ITB Sub-Clauses 4.1 and 4.2. <input type="checkbox"/> 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: _____

Date: _____

JVA Partner Legal Name: _____

ICB No.: _____

Page _____ of _____ pages

Non-Performing Contracts in accordance with Section III, Evaluation Criteria			
<input type="checkbox"/> Contract non-performance did not occur during the stipulated period, in accordance with Sub- Factor 2.2.1 of Section III, Evaluation Criteria			
Pending Litigation, in accordance with Section III, Evaluation Criteria			
<input type="checkbox"/> No pending litigation in accordance with Sub-Factor 2.2.2 of Section III, Evaluation Criteria			
<input type="checkbox"/> Pending litigation in accordance with Sub-Factor 2.2.2 of Section III, Evaluation Criteria, as indicated below			
Year	Outcome as Percent of Total Assets	Contract Identification	Total Contract Amount (current value, US\$ equivalent)
_____	_____	Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	_____
_____	_____	Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	_____

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.

Name of contract	Employer, contact address/tel/fax	Value of outstanding work (current US\$ equivalent)	Estimated completion date	Average monthly invoicing over last six months (US\$/month)
1.				
2.				
3.				
4.				
5.				
etc.				

Form FIN – 3.1

Financial Situation**Historical Financial Performance**

Bidder's Legal Name: _____

Date: _____

JVA Partner Legal Name: _____

ICB No.: _____

Page _____ of _____ pages

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

Financial information in US\$ equivalent	Historic information for previous _____ (____) years (US\$ equivalent in 000s)						
	Year 1	Year 2	Year 3	Year ...	Year n	Avg.	Avg. Ratio
Information from Balance Sheet							
Total Assets (TA)							
Total Liabilities (TL)							
Net Worth (NW)							
Current Assets (CA)							
Current Liabilities (CL)							
Information from Income Statement							
Total Revenue (TR)							
Profits Before Taxes (PBT)							

- ☐ 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

Annual turnover data (construction only)		
Year	Amount and Currency	US\$ equivalent
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
*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 FIN 3.3
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

Source of financing	Amount (US\$ equivalent)
1.	
2.	
3.	
4.	

Form EXP 2.4.1**Experience - General Experience**

Bidder's Legal Name: _____ Date: _____

JVA Partner Legal Name: _____ ICB No.: _____

Page _____ of _____ pages

Starting Month / Year	Ending Month / Year	Years *	Contract Identification	Role of Bidder
_____	_____		Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____
_____	_____		Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____
_____	_____		Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____
_____	_____		Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____
_____	_____		Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____
_____	_____		Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____

*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

Similar Contract Number: ____ of ____ required.	Information		
Contract Identification	_____		
Award date	_____		
Completion date	_____		
Role in Contract	<input type="checkbox"/> Contractor	<input type="checkbox"/> Management Contractor	<input type="checkbox"/> Subcontractor
Total contract amount	_____		US\$_____
	_____		_____
If partner in a JVA or subcontractor, specify participation of total contract amount	_____ %	_____	US\$_____
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: _____

Similar Contract No. __[insert specific number] of [total number of contracts] __ required	Information
Description of the similarity in accordance with Sub-Factor 2.4.2a) of Section III:	
Amount	_____
Physical size	_____
Complexity	_____
Methods/Technology	_____
Physical Production Rate	_____

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

	Information		
Contract Identification	_____		
Award date	_____		
Completion date	_____		
Role in Contract	<input type="checkbox"/> Contractor	<input type="checkbox"/> Management Contractor	<input type="checkbox"/> Subcontractor
Total contract amount	_____		US\$_____
If partner in a JVA or subcontractor, specify participation of total contract amount	_____ %	_____	US\$_____
Employer's Name:	_____		
Address:	_____		
Telephone/fax number:	_____		
E-mail:	_____		

Form EXP – 2.4.2 (b)(cont.)**Specific Experience in Key Activities (cont.)**

Bidder's Legal Name: _____ Page _____ of _____ pages

JVA Partner Legal Name: _____

Subcontractor's Legal Name: _____

	Information
Description of the key activities in accordance with Sub-Factor 2.4.2b) of Section III:	

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)

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 _____⁶ (_____), 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.

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

As provided under the UN Declaration

PART 2 –Employer's Requirements

Section VI. Employer's Requirements

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Scope of Supply of Plant and Installation Services by the Contractor

The scope of work for the Supply, Delivery, Installation and Commissioning of a National Digital Terrestrial Television Broadcasting System in Zambia shall include, but not be limited to, Survey, Project Management, Design, Engineering, Supply of all related goods and providing all related services including installation of equipment, testing, commissioning, integration and related work, training and preparation of the related drawings and documents. The system to be deployed shall be the second generation Digital Video Broadcasting Terrestrial (DVB-T2) standard with MPEG-4 compression.

The bidder shall carry out design and network planning to ensure 100 percent national coverage. Currently, the broadcasting coverage by population is about 80%. The signal distribution network shall utilise satellite and a combination of existing optic fibre and microwave networks where possible. Therefore, the bidder is required to provide necessary interfaces. Information on the existing terrestrial transmission network shall be provided.

The bidder shall be responsible for all the works to ensure provision of a complete solution and thus shall provide all special tools and test equipment required for successful implementation of the project.

Specification

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Acronyms and Glossary of Terms

Acronym	Description
ATM	Automated Teller Machine
CRM	Customer Relations Manager
DSS	Decision Support System
HTTP	Hypertext Transfer Protocol
IDP	Institutional Development Plan
LAN	Local Area Network
MICR	Magnetic Ink Character Recognition
OLTP	Online Transaction Processing
RF	Radio Frequency
SQL	Structured Query Language
TCP/IP	Transmission Control Protocol/Internet Protocol
WAN	Wide Area Network
OB	Outside Broadcasting
VHF	Very High Frequency
UHF	Ultra High Frequency
ASI	Asynchronous Serial Interface
DTT	Digital Terrestrial Television
STB	Set Top Box
CCTV	Closed Circuit Television
DVB-T2	Digital Video Broadcast Terrestrial 2 nd Generation
PAL-B/G	Phase Alternate Line

1. Introduction

The equipment to be supplied shall be in conformity with the relevant clauses of the technical specifications in this invitation to tender. The specific technical requirements are given hereunder. The Bidder shall ensure that the minimum requirements specified are met and any additional requirements to make the designed system complete are included. In this specification, requirements are given for the turnkey project roll-out.

2. Technical Specifications and Compliance Statement

The technical specification defines the technical requirements for equipment to be offered and services to be rendered.

The bidder shall respond to the technical specifications clause by clause, demonstrating the substantial responsiveness of the overall design of the system and the individual equipment, goods, and services offered to those requirements using the acceptable compliance statements. The description of the acceptable compliance statements to be used is shown in Table 1.1 below.

Compliance Statement	Qualification	Meaning
Fully comply		The offered equipment is fully compliant with the requirement of the clause and the BOQ shall be understood to include the feature or service to which the bidder has indicated full compliance.
Not comply		The offered equipment does not strictly comply with the requirements of the clause.

Table 1.1: Acceptable Compliance Statements Description

The bidder shall complete in full the technical compliance table using the acceptable compliance statements described in Table 1.1 above. The format of the technical compliance table shall be as shown in Table 1.2 below. The response shall be in sequential order, the same as is given in this specification. An example of a response to a specification is included in the table below.

Clause	Description	Compliance statement	Cross-Reference	Comment/Notes
1.1	The Bit Error rate shall be better than 1×10^{-3}	Fully Comply	Chapter 2, Page 3, item 1a	The bit error rate we offer is better than the specification.

Table 1.2 Sample Format of Technical Compliance Table

The compliance column of the technical compliance table shall contain one and only one of the acceptable compliance statements.

If no acceptable compliance statement is given for any clause, the equipment will be assumed not compliant.

For purpose of compliance verification, a document and page number cross-reference must be given in the reference column of the compliance summary statement. Failure to do so shall be considered a deviation.

Any clause marked with “fully comply” in the bidders’ technical compliance table is binding on the successful bidder to supply equipment that meets the requirements of that clause. This shall apply for the lifetime of the awarded contract.

The bidder is required to provide detailed explanatory materials (documents) in order to make the proposal given as clear as possible. The document should include detailed technical description of all the elements of the proposed equipment, highlighting all essential technical, performance and other relevant characteristics. If there is disparity between these support documents and the compliance statement, the service or equipment will be taken to be Not Compliant. Particular attention should be given to clearly state the version of the proposed equipment to avoid confusion in equipment features (e.g., version, release, and model numbers).

3. Technical Standards

In proposing the system the bidder shall ensure that equipment to be supplied will comply with necessary standards as shown in Table 3 below. Notwithstanding the above, the table is not conclusive. The bidder is required to list the relevant international standards of equipment to be supplied and to ensure that all equipment to be supplied complies with relevant international standards from recognized standardisation bodies.

Item	Technical Standards
1.	ETSI EN302 755 (for DVB-T2 standard)
2.	ETSI EN300 744
3.	ETSI TR 101190

4.	ETSI TR 101191
5.	ETR 290
6.	EN 60950
7.	EN 60215
8.	EN 55011
9.	Low Voltage Directive, 73/23/EEC
10.	EMC Directive, 89/336/EEC
11.	EC Marking Directive, 93/68/EEC
12.	RoHS Directive 2002/95/EC
13.	WEEE Directive 2002/96/EC

Table 1.3: Technical Standards

4. Background Information

Zambia is located in the southern part of Africa east side of Angola with geographical coordinates at 15 00 S, 30 00 E. It is a landlocked country that has a total border line stretching for 5,664 Km bordering Angola 1,110 km, Democratic Republic of Congo 1,930 km, Malawi 837 km, Mozambique 419 km, Namibia 233 km, Tanzania 338 km and Zimbabwe. Zambia has a total area of 752,614 sq Km of which 11,890 sq Km is covered with water and 740,742 sq km is land. It experiences a tropical climate modified by altitude and the rainy season falls between October and April. It is considered that 58 per cent of Zambia's total land area has a high potential for agricultural production, of which only 14 per cent of the total agricultural land is currently under cultivation. The terrain is mostly plateau with some hills and mountains in some parts of the country. The lowest point in Zambia is the Zambezi River at 329m and the highest point is located in Mafinga Hills at 2301m. Zambia's natural resources are copper, cobalt, zinc, lead, coal, emeralds, gold, silver, uranium, rivers and lakes.

The population of Zambia is presently at 13.4 million people with about 65% of the population living in the rural areas. The administration of the country comprises 10 Provincial Administrative centres and 83 Districts.

4.1 *Present Analogue TV and Radio in Zambia*

4.1.1 **Television**

The Broadcasting sector is liberalized. There are about seven licensed operational television terrestrial broadcasters, though television (TV) broadcasting in Zambia is mainly provided by the national broadcaster, the Zambia National Broadcasting Corporation (ZNBC). The television coverage by the national broadcaster is about 80% by population as shown in figure 1.1.

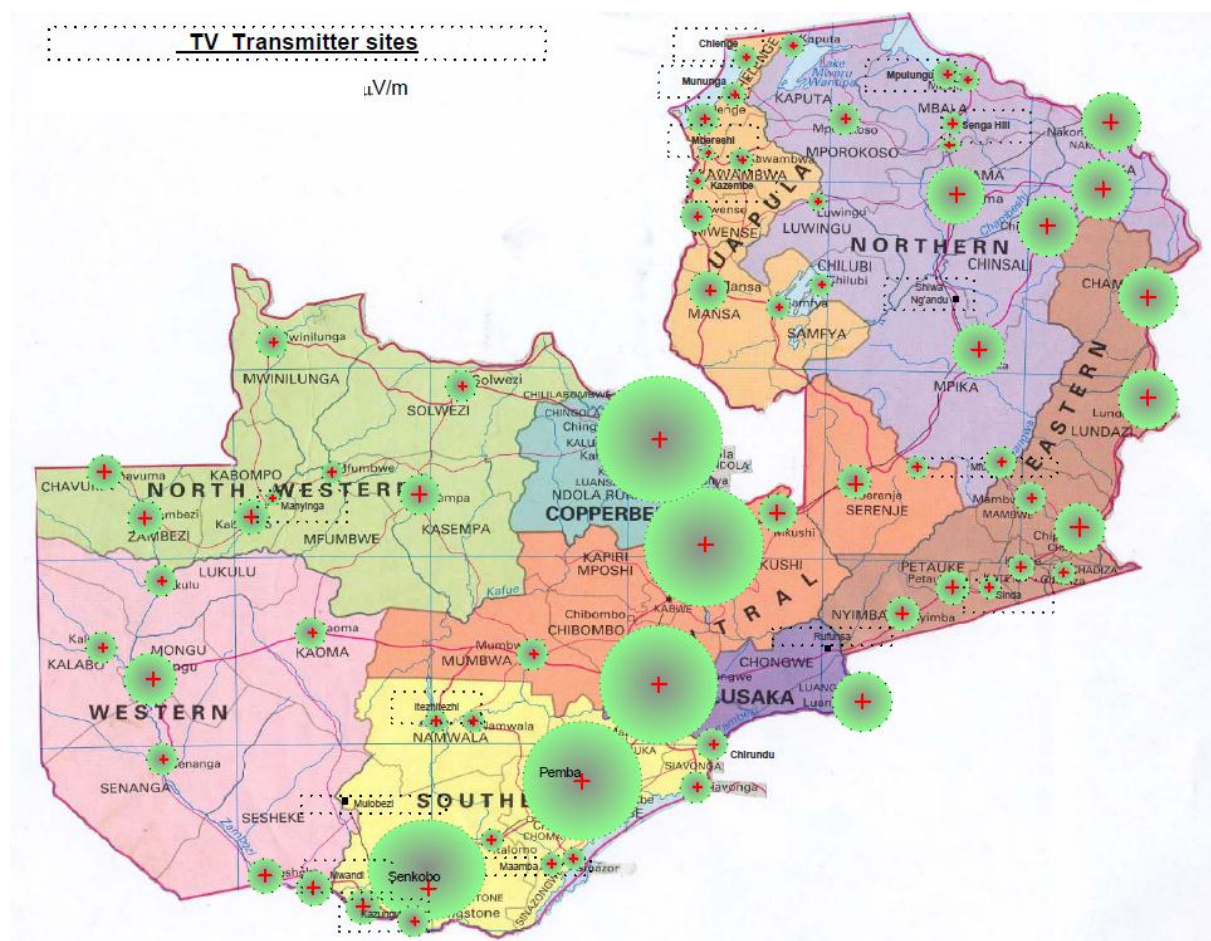


Figure 1.1: ZNBC TV Coverage in Zambia

The national public broadcaster has sixty seven (67) broadcasting transmitter sites which are located as shown above and as listed in Table 1.6. The country-wide distribution of transmitter stations by television broadcasters is as given below.

Broadcaster		No. of Transmitter
1	ZNBC	67
2	North west	1
3	Muvi TV	3
4	Mobi TV	1
5	CBC	1
6	TBN	3

Table 1.4: Number of Transmitter Stations by Broadcasters

4.1.2 Terrestrial Television Transmitter Relays

The current status in terms of Analogue Terrestrial Television Transmitters is that the National Broadcaster is running sixty-three (67) relay stations countrywide. These are categorized as High Power, Medium Power and Low Power.

The group of **high power**, comprises five stations along the line of rail, commissioned at 20KW each in the early 1980's. The five (5) are Kitwe, Kapiri - Mposhi, Lusaka, Pemba and Senkobo. The original design was intended to allow for transmissions from adjacent sites to overlap thereby giving seamless coverage along the Line of Rail.

The second group comprises the **medium power** transmitters at provincial capitals, rated between 500Watts to 1KW. These were meant to cover most of the population around the provincial capitals within a radius of about 30 to 40 km. Like the high power transmitters these were also commissioned in the early 1980's.

The third category, which is the biggest number, consists of relay stations established under the *Rural TV* Project after the year 2000. These transmitters are all in the **low power** range not exceeding 150Watts, and meant to service small populations such as are found at rural district centres and other smaller population concentration settlements.

In terms of the number of relay sites, the low power stations form the largest percentage at 68%, followed by the medium power stations ,24% and the high power stations at 8%.

4.1.3 Television Coverage

In the years 2006 to 2008, the National Broadcaster spread the TV coverage to beyond the Provincial centres by using the satellite distribution platform. This basically led to the availability of the Television signal across the entire continent of Africa for viewers who could afford satellite receiving kits. The fact that the footprint of the satellites on which ZNBC rides has presence over the entire Zambian territory implies that ZNBC TV has 100% coverage over the whole of Zambia by Satellite. However, a larger sector of the Zambian population cannot afford satellite receiving hardware and so a realistic measure of coverage is that of terrestrial transmission reach.

There are no official figures as to what percentage population is covered by terrestrial transmission coverage after the terrestrial transmission expansion but the extent of coverage can be perceived from the number of cities, towns and other population settlements where terrestrial transmitters have been installed. Hence, the estimation of 80% coverage.

4.1.4 Transmitter Technology

All television transmitters are transmitting analogue signals. Of these, all the medium and high power transmitters that were installed in the early 1980's have no parts capable of successfully processing a digital signal except for some antenna systems.

4.1.5 Programme Distribution

ZNBC TV base-band programme signals are dispatched from Lusaka Master Control Room for distribution to all relay transmitters. Before October 2006, distribution of ZNBC TV programme signal was achieved through the ZAMTEL Terrestrial Microwave network. This network had limited capacity to take the program beyond the provincial capitals and this partly contributed to the long delay in expanding television coverage to other parts of the country. All the newly installed and a larger proportion of the old terrestrial transmitters are now utilizing the satellite delivery system for program signal inputs.

In October 2006, ZNBC and Multichoice agreed for the former to use some available bandwidth on satellite for the delivery of ZNBC TV and one stereo audio program. This development resulted in the availability of the ZNBC TV signal on two satellite beams namely Pas4 C-Band and Pas7/10 Ku-Band. The Pas4 C-Band was meant for backhauling into Multichoice South Africa for packaging onto the Multichoice Pay TV bouquet which is on Pas7/10 Ku-Band. The Pas 4 C-Band program was not encrypted and was therefore available free-to-air over the entire African continent.

Due to a directive by Intelsat for DSTV to migrate to another satellite, ZNBC like five other national broadcasters were requested to migrate to another satellite namely IS904 on 30th May 2012.

4.1.6 ZNBC Television Studio Infrastructure in Lusaka

ZNBC at Lusaka Headquarters has three Television Studios. Two of the three are large production studios whose dimensions are $16.5 \times 10.75 \times 9.3 \text{ m}^3$ (Lx Wx H) whilst the third is a continuity studio whose volume is $7.75 \times 6.65 \times 3.53 \text{ m}^3$ (Lx Wx H).

One of the two large studios is serviced by a 3 camera chain whilst the other is using 2 camera chains.

4.1.7 ZNBC Television Studio Infrastructure in Kitwe

The TV Studios are operating using a 2 camera chain placed in a space of $12.5 \times 9.5 \times 4.5 \text{ m}^3$. The rest of the transmission sites do not have studio infrastructure. This also means that new studios will need to be constructed at the Head Ends in order for government's intention of providing provincial television studios to be fulfilled.

4.1.8 Radio Stations

In Zambia the present analogue system uses PAL-B/G and the operating radio frequency (RF) bandwidth is 8MHz. ZNBC operates both in the VHF and UHF bands of the broadcasting frequencies. The main 5 TV broadcasting transmitters which are along the line of rail were designed to operate at 20kW whereas 5 TV transmitters located in provincial centres were designed to operate at 1kW. The remaining transmitters are rated between 20 – 200W and these are located in districts and small populated centres.

5. Description of System Requirements

5.1 Overview of System Requirements

The overall system layout is as depicted in figure below

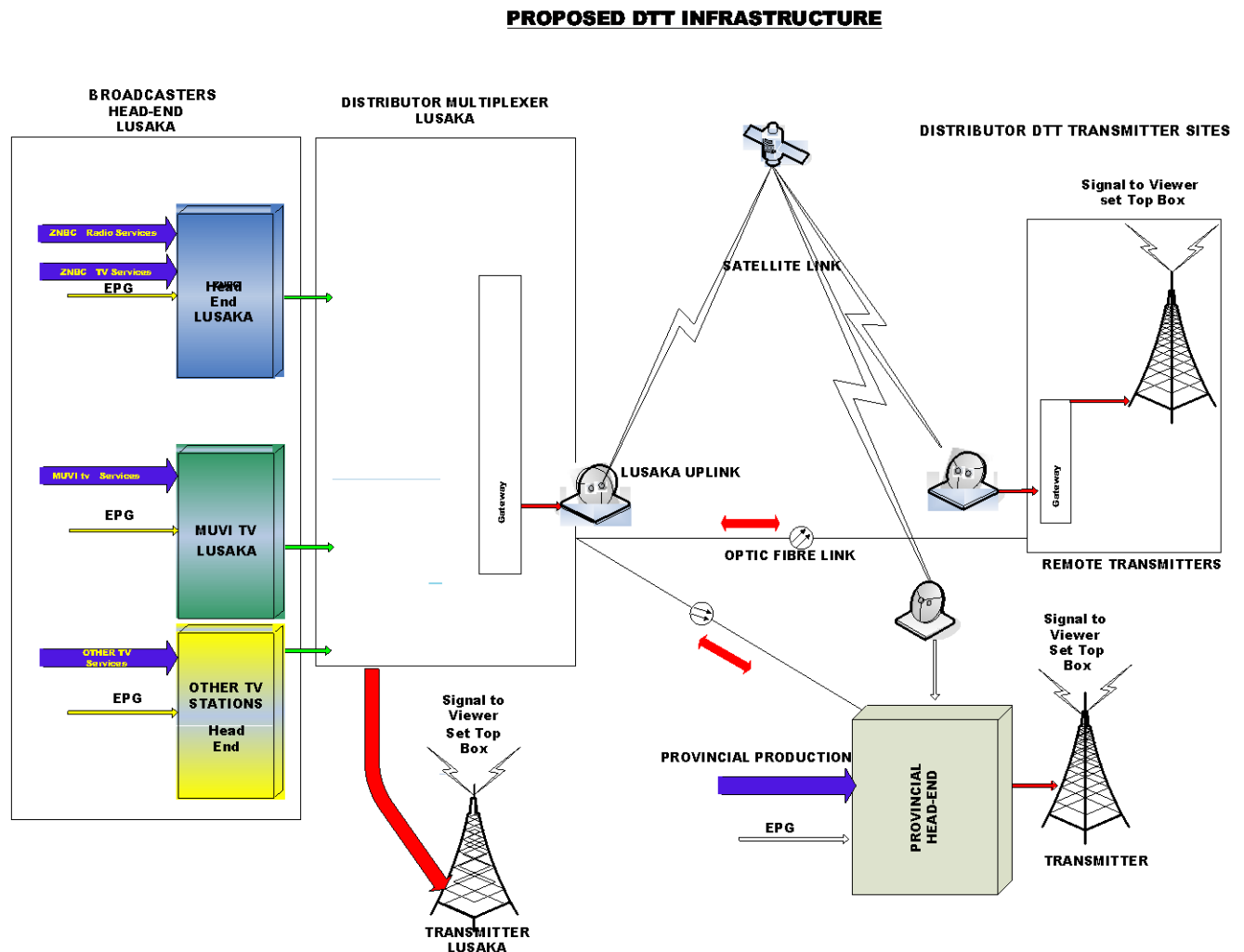


Figure 1.2: Proposed Network Architecture

The system shall be scalable to accommodate new functions and tasks and to allow for extension of geographic coverage.

The network shall have a multimedia facility for voice, data, image and computer communications.

The system requirements shall include the following;

5.1.1 Studio System

- (a) Refurbishment of the existing two production studios and one continuity studio for Lusaka and one production studio for Kitwe.
- (b) Construction of two new studios in Lusaka and one in Kitwe
- (c) Replace current studio lighting system with cool lighting system for both Lusaka and Kitwe studios
- (d) Supply and installation of Head-End at all provincial centres and associated multiplexing equipment
- (e) Supply, installation of On Air Server System for all the (9) studio production centres
- (f) Supply and installation of Video Archiving system at all (9) Head- Ends
- (g) Supply and installation of Virtual Studio for all Head ends Centres
- (h) Supply and installation of Ingest Server System at all production Centres.
- (i) Supply of Flyaway Kit for each Regional Broadcasting Centre
- (j) Supply of 4 Wireless Camera systems for Lusaka.
- (k) Overhaul of the cooling system for Lusaka and Kitwe.
- (l) Provide Backup Power for Lusaka and Kitwe.
- (m) Intercom system to link all broadcasting centres.
- (n) Supply of specialised broadcast test equipment

5.1.2 Signal Transmission and Distribution

- (a) Supply and Installation of DVB-T2 digital transmitter equipment and accessories complete with associated RF Antenna system at all existing sites including green fields.
- (b) Supply and Installation of backhaul transmission digital microwave links for the Transmitter sites that do not have available digital transmission systems.
- (c) Supply and Installation of Satellite Uplink to be installed at the Central Head End to be located in Lusaka.
- (d) Build support infrastructure including towers and equipment containers on sites without adequate space and Greenfields.
- (e) Link all Regional Head Ends through Optical Fibre/Digital Microwave and satellite.

- (f) Supply and Installation of CCTV for all the nine (9) Head Ends
- (g) Supply and Installation of Media Converters at all the nine (9) Studio production Centres to convert from SDI to Optical and Vice-versa.
- (h) Supply of DVB-T2, M-PEG4 set top boxes

5.1.3 Outside Broadcasting

Supply of two (2) state of the art OB vans

5.1.4 Communication Network

The network shall use a combination of Satellite, fibre optic and microwave links.

5.1.5 Other Requirements

- 5.1.5.1 Supply and install Conditional Access System
- 5.1.5.2 Supply and install Subscriber Management System
- 5.1.5.3 Supply and install Network Management System (alarms)
- 5.1.5.4 Standards Compliance
- 5.1.5.5 Supply and install Surveillance System
- 5.1.5.6 Supply and install an Intercom System
- 5.1.5.7 Installation of complete DC Power Plants for Greenfield sites and in existing sites that do not have adequate power capacity, according to the proposed equipment's power requirements.
- 5.1.5.8 Supply of all related goods and engineering services necessary for the turnkey project.
- 5.1.5.9 Provision of sufficient technical documentation (system manuals) for configuration, operation, monitoring and maintenance of the system.
- 5.1.5.10 Carry out Plant and Installation Site Performance Testing and commissioning of all the supplied goods (main and related equipment including software).
- 5.1.5.11 Supply sufficient spares that will cater for 3 years of normal operation of the equipment.
- 5.1.5.12 Transportation of all equipment and materials from the port of entry to the central storage areas and from the central storage areas to project sites prior to commencement of the project roll out.
- 5.1.5.13 Training (Foreign and Local) for Purchaser's staff in the planning, configuration, operation and maintenance of the proposed system.
- 5.1.5.14 Project Management Team which shall take care of delivery of all goods, installation and performance of the aforementioned services, within the scheduled time.

5.2 Detailed Description of the System Requirements

5.2.1 Studio System

Currently, the National Broadcaster has three production studios located in Lusaka, Livingstone and Kitwe. These shall require refurbishment to capacitate production of Standard Definition (SD) and High Definition (HD) programming. The project entails deployment of nine (9) new Head Ends to be located as shown in Table 1.5 below, including Lusaka and Kitwe. This will allow for regional broadcasting and widen the coverage of Broadcasting in Zambia. At each Head End a production studio shall be constructed for SD programming and upgradable to HD at a later stage apart from the line of rail, where there shall be 4 HD channels.

The Head-End should have the following functionality:

- (a) Receive programs from local studios.
- (b) Receive satellite services (clear / scrambled)
- (c) Decoding and Encoding services
- (d) Scramble service by Conditional Access System (CAS)
- (e) Inject the Electronic Programing Guide (EPG) information in the multiplexer using MHEG-5 middleware
- (f) Connect to the Subscriber Management System (SMS) for operation management
- (g) Network Management
- (h) Service monitoring

The bidder must provide all equipment necessary to obtain the content processing system for distribution: RF distribution, Integrated Receiver Decoder (IRD), Encoding devices, Connectivity and all ancillary equipment necessary for the acquisition of Digital TV content, digital compression and distribution to an IP network.

In the Head-End, 64 SD video services will be broadcasted. Considering both bandwidth and quality, MPEG-4/H.264 shall be used as the compression technique.

The encoder in the Head-End will encode all programs and deliver them to the central distribution network. Each program data rate will be around 2 Mbps for MPEG-4 SD Channel.

The requirements and specifications for studios and equipment in the Head Ends is as given in Annex I.

No.	Head – End	Province	Location	
			Lat.(S)	Long.(E)
1	Lusaka Main	Lusaka	15.40639	28.32242
2	Kitwe	Copperbelt	12.22678	28.22678
3	Chipata	Eastern	13.643964	32.625639
4	Kasama	Northern	10.2061	31.18756

5	Mansa	Luapula	11.230361	28.883684
6	Solwezi	North Western	12.18381	26.40424
7	Mongu	Western	15.271561	23.128603
8	Kabwe	Central	14.44408	28.4422
9	Choma	Southern	16.8105	26.9844
10	Chinsali	Muchinga	10.551991	32.068485
11	Livingstone	Southern	17.8578	25.8583

Table 1.5: Location and Names of Head-Ends

5.2.2 Signal Transmission and Distribution

The current broadcasting coverage by population in Zambia is about 80%. The bidder is expected to come up with 100% network coverage planning which should include the current sixty Seven (67) sites and Greenfields. Therefore, the bidder is expected to adjust the transmitting power to the actual conditions and power to achieve the desired coverage at current sites and the already identified new sites as in table 1.6 below. The transmitter powers shall fall within the DTT recommended transmitter power. The bidder will ensure that where transmitters of 3kW and above are installed, the liquid cooling system shall be used. The signal distribution in the country shall be achieved through satellite, fibre optic and microwave. The bidder is required to quote for all options and for each option to indicate the time to implement. The required specifications for transmitters are as specified in Annex II. The bidder shall assess current infrastructure at the sites and will propose best solution for shelters at existing sites where equipment space is not sufficient. Notwithstanding the above, existing shelters in good condition shall be utilized. The digital transmitters to be installed for signal distribution shall comprise but not limited to the following;

- (a) DVB-T2 dual Exciter in 1+1 Mode with auto change over, control and monitoring.
- (b) The required number of power amplifier units necessary to provide the rated DVB-T2 RMS power measured after the output filter.
- (c) Professional Grade Standard 19" equipment rack
- (d) Liquid Cooling System including Heat Exchanger System with Redundant pumps, fans, etc and all other associated accessories and diagrams.
- (e) RF Coaxial indoor system and necessary patch panels including all required reject and test loads.
- (f) Calibrated RF power measurement/Metering System.
- (g) Input and Monitoring Equipment.
- (h) 40KVA on-line UPS together with Isolation Transformer and Battery Banks.
- (i) RF coaxial feeder cable with associated Dehydrator and all necessary connectors

- (j) RF antenna panels and associated splitter with necessary cables and connectors.
- (k) 2-Way Modular combiner unit.
- (l) Measuring Instruments and tools

The bidder shall be expected to undertake physical site visits of existing transmission sites listed below at own cost to establish the status of existing facilities to facilitate submission of a comprehensive bid that is responsive to the purchaser's requirements.

No.	Station Name	Transmitter Power (W)	Antenna Height/HASL(M)	Antenna Type	LOCATION Coordinates	
					Lat. (S)	Long. (E)
1	Kaputa	50	30/922	4-Stack Folded Dipole	08S28.281	29E39.703
2	Chiengi	50	30/1019	4-Stack Folded Dipole	08S39.208	29E10.703
3	Nchelenge	100	55/943	4-Stack 3 element Yagi	09S20.888	28E44.201
4	Kawambwa	100	32/1342	4-Stack 3 element Yagi	09S47.708	29E04.630
5	Kasembe	50	30/973	4-Stack 3 element Yagi	09S49.277	28E46.352
6	Mwense	100	35/995	4-Stack 3 element Yagi	10S23.341	28E42.125
7	Sanfya	100	60/1190	4- Stack Folded Dipole	11S22.310	29E33.459
8	Chilubi Island	50	64/1178	4- Stack Folded Dipole	11S06.907	29E56.771
9	Mansa	2000	60/1250	VHF B III Antenna Panels	11.230361	28.883684
10	Mbereshi	150	80/955	4- Stack Folded Dipole	9.762367	28.80668
11	Mununga	150	80/947.01	4- Stack Folded Dipole	9.034659	29.048659
12	Luwingu	50	40/1464	3-Element Yagi, 4- Stack Folded Dipole	10S14.989	29E55.158
13	Mporokoso	100	40/1435	4-Stack Folded Dipole	09S22.013	30E07.292
14	Mungwi	50	30/1376	4-Stack Folded Dipole	10S10.316	31E22.072
15	Mbala	100	30/1646	4-Stack Folded Dipole	08S50.632	31E22.375'
16	Mpulungu	20	30/785	9-Element Yagi	08S45'50.73"	31E06'23.04
17	Nakonde	100	37/1673	4-Stack Folded Dipole	09S19.364	32E45.721
18	Isoka	20	27/1310	9-Element Yagi	10S09.323	32E38.109
19	Chinsali	100	65/1283	4-Stack Folded Dipole	10S33.119	32E04.108
20	Kasama	1000	50/1393	VHF B III Antenna Panels	10.2061	31.18756
21	Mpika	100	50/1644	VHF B III Antenna Panels	11.845519	31.467038
22	Nondo	20	60	9-Element Yagi		
23	Senga Hill	125	80/1589	2 Stack Dipole	9.358881	31.24696
24	Mupepetwe	100	15	1 Folded dipole		
25	Serenje	20	22/1640	4-Stack Folded Dipole	13S14.935	30E11.375
26	Mkushi	100	27/4183ft	4-Stack Folded Dipole	13S37.649	29E23.682
27	Luangwa	100	24/365	4-Stack Folded Dipole	15S37'31.85	30E24'33.13
28	Lusaka	20000	100/1267	VHF B III Antenna Panels	15.40639	28.32242
29	Chirundu	100	36/400	4-Stack Folded Dipole	16.035669	28.85102
30	Siavonga	20	45/626	UHF Dipole	16.529964	28.707702
31	Namwala	20	50/990	9-Element Yagi	15.755221	26.433027
32	Kapiri Mposhi	20000	70/1310	VHF B III Antenna Panels	14.01478	28.68148
33	Pemba	20000	70/1256	VHF B III Antenna Panels	16.523832	27.324352
34	Mumbwa	100	50/1183	4-Stack Folded Dipole	14.983824	27.060789
35	Itezhitze	20	30/1087	9-Element Yagi	15.74756	26.019327
36	Nyimba	100	72/721	4-Stack Folded Dipole	14S33'31.14	30E49'10.17
37	Petauke	100	45/1017	4-Stack Folded Dipole	14S14'40.72"	31e20'06.28"
38	Katete	50	24/1364	4-Stack Folded Dipole	14S04'54.20"	32E05'46.81"

39	Mambwe	100	24/600	9-Element Yagi	13S17'34.28"	32E05'20.93"
40	Mfuwe	20	24 558	4-Stack Folded Dipole	13S15'02.69"	31E56'11.74"
41	Lundazi	20	24/1136	9-Element Yagi	12S17'42.38	33E10'29.60"
42	Chama	100	36/770	4-Stack Folded Dipole	11S12'55.60"	33E09'15.90"
43	Chipata	1000	70/1409	VHF B III Antenna Panels	13.643964	32.625639
44	Chadiza	150	30/1065	4-Stack Folded Dipole	14.067101	32.439917
45	Sinda	150	50/1075	4-Stack Folded Dipole	14.209458	31.758412
46	Mwinilunga	100	24/1062	4-Stack Folded Dipole	11S43'56.03	24E25'50.48"
47	Zambezi	100	36/1068	4-Stack Folded Dipole	13S32'47.97"	23E06'34.58"
48	Mufumbwe	50	24/1348	4-Stack Folded Dipole	13.15037	25.034164
49	Kasempa	100	36/1237	3-Element Yagi, 4- Stack Folded Dipole	13S27'37.80"	25E49'54.43"
50	Kabompo	100	36/1090	2-Stack Dipole	13S36'17.31"	24E12'29.94
51	Solwezi	1000	50/1356	VHF B III Antenna Panels	12.18381	26.40424
52	Chavuma	125	50/1072	2 Stack Dipole	13.086745	22.689115
53	Manyinga	20	80/1098	9-Element Yagi	13.408486	24.334838
54	Lukulu	20	30/1052	9-Element Yagi	14S24'27.37"	23S15'31.68"
55	Mongu	1000	60/1030	VHF B III Antenna Panels	15.271561	23.128603
56	Kaoma	100	36/1182	4-Stack Folded Dipole	14.824934	24.797968
57	Kalabo	20	30/1026	9-Element Yagi	14.9985	22.67935
58	Senanga	20	30/1014	9-Element Yagi	16.110053	23.294805
59	Mwandi	125	80/939	2 Stack Dipole	17.512349	24.823836
60	Sesheke	100	30/952	4-Stack Folded Dipole	17.470691	24.293975
61	Maamba	50	36/599	4-Stack Folded Dipole	17.357614	27.214242
62	Sinazongwe	50	30/536	4-Stack Folded Dipole	17.263293	27.457596
63	Kazungula	150	80/934	4-Stack Folded Dipole	17.775156	25.274796
64	Kalomo	20	50/1248	9-Element Yagi	17.029194	26.49148
65	Senkobo	20000	70/1174	VHF B III Antenna Panels	17.602139	25.977913
66	Livingstone	1000	72/972	UHF Antenna Panels	17.83949	25.85501
67	Kitwe	20000	120/1247	VHF B III Antenna Panels	12.22678	28.22678
68	Shiwa Ngandu		1470		11°12'06.54"	31°44'14.97"
69	Shangombo		1015		16°32'27.63"	22°48'38.04"
70	Munyumbwe (Gwembe Valley)		1240		16°29'47.67"	27°36'03.53"
71	Kawambwa Tea Estates					
72	Lumwana Mine					
73	Lufunsa					
74	Chingola		1360		12°32'38.82"	27°51'28.54"
75	Chililabombwe		1320		12°22'07.01"	27°50'20.32"
76	Ndola					
77	Milenge		750		10°38'48.21"	32°48'36.55"
78	Sinjembela					
79	Sinazeze		576		17°08'43.73"	27°24'22.96"
80	Malole		1300		10°07'25.75"	31°34'15.24"
81	Matumbo		1430		10°57'43.80"	32°02'02.72"
82	Musonda Falls					
83	Mulundu					
84	Lukwesa		940		10°09,59.17"	28°38'10.84"

Table 1.6: List of Transmitter site Locations

5.2.3 Outside Broadcasting (OB) Vans

In order to cater for real time and recorded programming during special events away from Head-Ends, the bidder shall supply two state of art OB vans for the purpose.

These shall be located at the main Head-Ends namely Lusaka and Kitwe. The OB vans shall be equipped with capabilities to handle SD and HD programme production. The OB vans shall have a satellite uplink to be able to uplink programming to any of the Head-Ends for re-broadcasting and also shall be equipped with microwave transmission links. The set up for working spaces in the Van shall be set up as shown in figure 1.3

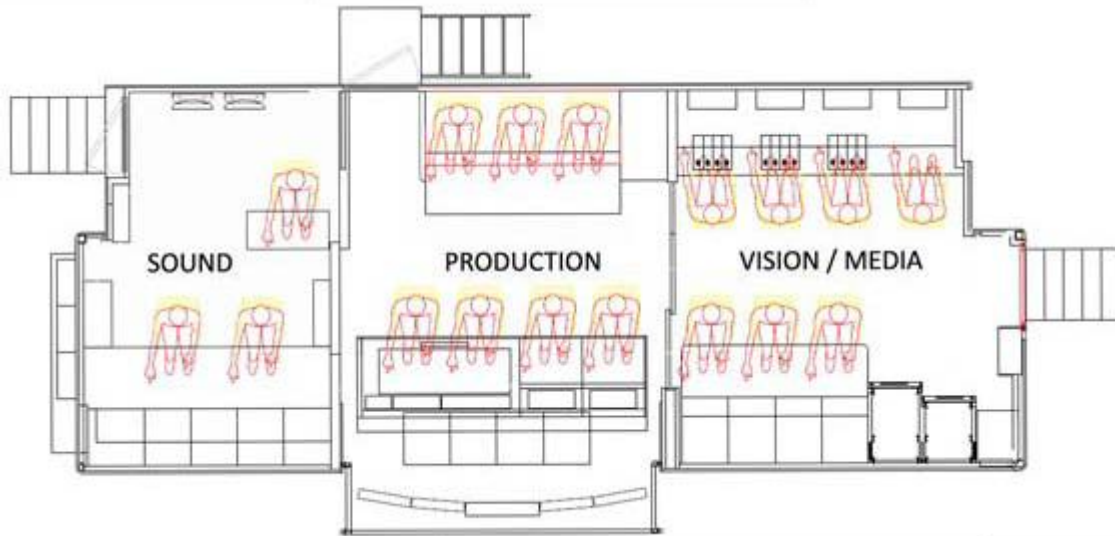


Figure 1.3: OB Van setup

5.2.3.1 OB Van Technical Features

The Outside Broadcasting Vans shall consist of but not limited to the following:

- (a) Dimensions for the housing the studio shall be at least (12m x3m x4m)
- (b) Cameras up to 8 High/Standard Definitions
- (c) Video Switcher-SD/HD Switchable 32 Inputs, 24 Outputs with Chroma Key
- (d) Matrix 128 x 128 SD/HD
- (e) Headsets for Video Cameras
- (f) Professional DVD/CD Player/Recorder and Printer
- (g) Monitor Wall- 16 Source Monitors
- (h) Rec/Play- Up to 14 VTR: Digital Betacam, HD CAM, Betacam SP
- (i) Mixer- 48 Mic Line Inputs pre-cabled for multi-recording
- (j) Matrix 32 x32 Analog Stereo 64x64 AES Stereo
- (k) Stereo Headphones
- (l) Boom Microphones with Floor Stands

- (m) Dynamic Microphones
- (n) Main Audio Loud Speakers Monitoring
- (o) Rec/Play-CD, Minidisk, DAT, Hard Disk
- (p) Professional Intercom System-Wireless Intercom system
- (q) ISDN/PSTN-Telephone Hybrid
- (r) Character Generator-Dual Channel
- (s) Wireless COFDM Camera Transmitter – Complete with camera control and COFDM receiver.
- (t) Capable of Covering sports events (Slow-motion) -Up to 3 EVS XT-2 with 6 operator positions
- (u) Mobile Standard Standby Three Phase Power Generator
- (v) Portable Microwave Link for O.B Van
- (w) Standard Hand Lights with Full Accessories
- (x) Fully Air Conditioned

Note that it shall be the responsibility of the bidder to verify that all specifications and requirements are complete to ensure completeness of the installation.

5.2.4 Set-top-box

The bidder shall supply 200,000 DVB-T2, MPEG-4 set-top-boxes and receiving antennas as a starting point to enable viewership of digital terrestrial television. This should include the RCA cable required to connect between the STB and TV. The digital terrestrial television system to be installed shall be open to allow for different set-top-boxes of similar standards from various manufacturers to interoperate. As minimum, basic STBs will have the following features;

- (a) DVB-T2, MPEG4
- (b) VHF/UHF TUNER
- (c) RF Input/Output
- (d) Analog composite video output (Female RCA)
- (e) Analog Stereo Audio Output (Female RCA)
- (f) Remote control
- (g) EPG decoding Capability
- (h) Should also operate on 12 Volts DC
- (i) Signal strength bar for digital transponders
- (j) Automatic and manual channel scan options
- (k) Low power consumption

For high end STBs, the following specifications will apply;

- (a) Supports MPEG-2, MPEG-4 / H.264 and fully DVB-T2
- (b) Digital sound through coaxial output (S/PDIF)
- (c) Display showing channel number or time
- (d) Max. 100 channels memory capacity
- (e) Favourite lists for TV-and Radio program me
- (f) Quick and easy installation & user-friendly menu
- (g) Excellent Audio & Video quality
- (h) Parental lock function for menu and selectable per channel
- (i) Support Teletext , Full multi-lingual DVB subtitling and audio track support
- (j) Support 480i,480P,576i,576P
- (k) Electronic Programme Guide (EPG) for present/following event information and up to 7 days for on screen programme information
- (l) Multi-lingual support on screen menu (OSD): English, etc.
- (m) Signal strength bar for digital transponders
- (n) Automatic and manual channel scan options
- (o) Power on with last viewed channel
- (p) User-friendly remote control with coloured function buttons
- (q) Low power consumption
- (r) Connections: RF IN, Loop OUT, RCA, S/PDIF, USB2.0, RF Modulate Out
- (s) USB function: MEDIA PLAYBACK AND USB PVR (USB STICKERS AND MOBILE HDD with external power supply);
- (t) Timers recording and Time shift supported
- (u) Support USB&OTA Upgrade
- (v) Support Novel-Supertv CA

The supplied STBs will conform to the following technical standards;

Tuner & Band Switching	
Frequency Range	174~230,474~858 Mhz(VHF~UHF)
RF Input level	-80 ~ -10 dBm
Demodulation	
Modulation	256QAM,64QAM,16QAM,QPSK
Bandwidth	8M
Carriers	1K ,2K ,4K ,8K, 8KE , 16K , 16KE , 32K ,32KE
Demodulation	DVB-T2
Transmission mode	COFDM
Video Decoder	
Profile Level	MPEG-2 MP@ML (max to 15Mbps) AVC/H.264MP@L3(max to 8 Mbps)
Aspect Ratio	4:3, 16:9
Video Decoder	ISO/IEC 13818-1 MPEG-2, H.264/AVC Transport stream Specification
Video Resolution	PAL, NTSC

Audio Decoder				
Audio Decod	MPEG1 Layer2(max to 384kbps)			
Sampling rate	32,44.1,48kHz			
Audio Channel	Mono, Stereo			
Chip & Mermory				
CPU	MSD7819			
Memory	Flash	4MB		
	DDR	64MB		
A/V & Data In/Out (optional or component)				
RCA	CVBS,AUDIO L/R			
RF In	IEC 169-2 Female			
LOOP OUT	IEC 169-2 Male			
RFModulate Out	To TV and Loop In			
S/PDIF	Digital Audio output			
USB	USB2.0(PVR and upgrade software)			
Power Management				
Input Voltage	100—240VAC 50/60Hz			
Front Panel buttons	Power,	Volume	-,	Volume +,
	Channel -,	Channel +		
LEDs	Power-on / Standby; indicator of signal			
Smart card	Standard ISO7816			
Power Consumption	Running	< 8 W	Standby	< 2W
Size	230*152*40mm			
Accessories	RCU, AAA x 2 battery, user manual, A/V Line			

Table 1.7: STB Technical Specification

5.2.5 Communications Network

All Head-ends shall be linked through primary and secondary links for backup by either satellite or optic fibre, which is readily available in provincial centres. This will allow for real time broadcasting from regional Head-ends to the Main Head end in Lusaka. The remote transmitter stations in districts and small populated areas shall receive signal feeds through satellite network and Digital Microwave Radio where possible. The satellite uplink earth station feeding the remote transmitter sites shall be installed at the main Head-End in Lusaka. The bidder shall also ensure that all the remote broadcasting transmitter stations are capable to receive signal feed at a later stage by either through optic link or microwave apart from satellite feed.

5.2.6 Conditional Access System (CAS)

The bidder shall ensure that the system supplied has a conditional access platform. This is to allow for non free-to-air conditional programme access by authorised

viewers. The proposed platform for CAS should include EMMG, EMMS, Router, Database, Encrypter and console.

5.2.6.1 CA Library

CA software module should be embedded in the STB to fulfil the following tasks: parsing the CA private sections, communicating with the smart card, and transferring the data required by application for descrambling, etc. Furthermore, this software should also support applications such as On Screen Display, email and so on.

5.2.6.2 Smart Card

The smart card to decrypt ECM, EMM data should fully meet ISO7816 standard and cooperate with the CA library to implement security functions.

System Functions Requirement

The bidder shall ensure that the following functionalities will be part of the system that will be supplied;

- (a) Open an account to activate the smart card in the system.
- (b) Close an account to revoke all the entitlements on a smart card or to deactivate the card.
- (c) Provide entitlements of available products to a smart card to enable the smart card descramble specified transmitted programs.
- (d) Revoke entitlements specified entitlements on a smart card.
- (e) Enhanced security features such fingerprint display and lock and un-clock card.

5.2.6.3 Subscriber Management System (SMS)

The bidder shall include in the proposal an operation management software platform for Subscriber Management. The system proposed will provide for an integrated and effective management and support system for the comprehensive operation management. The functions of the Subscriber Management System should include but not limited to the following functionalities;

- (a) Open an account
- (b) Migration
- (c) Device suspension
- (d) Service reactivation
- (e) Account revocation

- (f) Replace devices
- (g) Product subscription
- (h) Subscription cancellation
- (i) Account recharging
- (j) Refund to accounts
- (k) Modification to subscriber info
- (l) Media Information System (MIS)
- (m) STB Boot Advertising
- (n) EPG Interface Advertising
- (o) Corner Advertising
- (p) Subtitle Advertising
- (q) System Configuration
- (r) Service Configuration
- (s) Content Management

5.2.7 Media Information System (MIS)

Media Information System (MIS) is a multi-media integrated service operational platform. Based on the MIS, a service provider can realize full time covering all users' channel and release multi-media information content in a precise and secure way.

5.2.7.1.1 STB Boot Advertising

After the set-top box start-up, the system shall automatically play picture advertising content, after the completion of the automatic display, it went into the channel display screen.

5.2.7.1.2 EPG Interface Advertising

When the subscriber do the volume adjusting, channel changing or fast channel choosing operation, the corresponding set-top box EPG interface will synchronously display real-time advertising message

5.2.7.1.3 Corner Advertising

Automatic display of advertisement information at the corner of the screen.

5.2.7.1.4 Subtitle Advertising

Automatic display scroll subtitles on any position of the screen when the user are watching the authorized program.

Long subtitle display, do not disappear while switching the channel, until that text subtitle is over.

5.2.7.1.5 System Configuration

The system shall have the Channel's broadcasting data with specific channel information before they are broadcasted. The Channel information shall be uploaded before adding the multimedia information.

The system shall have the Index configuration in order for the STB to find the corresponding multimedia application according to the index information.

5.2.7.1.6 Service Configuration

MIS shall be configured the following services rules:

- (a) Banning rules: this is to ban according to certain rules such as specific week banning, time slot banning and channel banning.
- (b) Rule configuration is to broadcast the application according to certain rules such as specific week and time slot.

5.2.7.1.7 Content Management

MIS content management shall include the following modules:

- (a) Application management: this is to manage the broadcasting MIS data.
- (b) AD management: this is to manage the image data, upload EPG AD and boot screen

5.2.7.1.8 Schedule Management

MIS schedule management shall include the following modules:

- i. Application scheduling: this is to edit and review the content player scheduling such as the normal application and STB boot application.
- ii. EPG AD scheduling: this is to edit and check the content of the EPG Ads.
- iii. Subtitle scheduling: this is to realize the subtitle content broadcasting control, display time control and time length control.
- iv. Corner AD scheduling: this is to broadcast the corner application data; it could realize corner AD display time control, etc

5.2.7.1.9 Mux Interface

In order to insert the MIS data to the transport streams, there would be the interface for communication the MIS and MUX.

5.2.8 Network Management (NMS)

In order to allow for the purchaser to management the digital terrestrial television system to be installed from one / two locations most preferably from the Lusaka Head-ends, the bidder will propose and supply on award of the contract a Network Management System to monitor and management the entire system. The features and functionalities of this NMS will include but not limited to the following;

- i. Adding, reconfiguring, or removing services and/ or equipment should be fast, easy, and error-free with NMS. Templates, wizards, consolidated data views and powerful cut-and-paste functions should be available for both the service and system modifications.
- ii. The management system must allow remote configuration of all the operative parameters of the equipment in the Head End via a GUI. The underlying equipment should automatically be reconfigured to accommodate the new operating parameters. The bidder must detail the exact features of the configuration tool.
- iii. The system must be capable of handling alarms generated by the different equipment in the chain. All the equipment included in the proposal must be monitored by the management system.
- iv. In response to certain events, the management system should automatically switch over to spare devices based on the defined high availability policies. The bidder will specify these procedures and the way of configuring them and their limitations.
- v. The management system will be able to report alarms/events to higher hierarchy network management systems (northbound interface). It will be the responsibility of the bidder to describe in detail the set of available interfaces for that purpose.
- vi. System should be able to connect and control fire detecting device and generates fire alarms by receiving alarm signals from smoke sensors and temperature sensors. The system shall have the capability to access the controller and able to send fire control alarms to the video to allow the user to view through onsite videos.

- vii. Redundancy system must support priority configuration. If many coders present fail at the same time the redundancy system must be able to identify the priority of each channel for the spare coders to assume the position of the channel coders with bigger priority.
- viii. The switchover to spare equipment must be done without interrupting equipment in perfect condition.
- ix. The Bidder must provide to the purchaser the proprietary MIBs of the equipment offered in the proposal which support SNMP management on the moment of the contract.

5.2.9 Media Asset Management System

- I. Media assets management system shall be the management and data search tool and calling tool of large amount of video and audio files for TV station, works up to be the application of the rich media object oriented integration management.
- II. Media asset management system shall be the overall platform of media data storage, management and issuing of the whole station, providing comprehensive services such as historic data digitalization, data filing, data search/calling, program broadcasting preparation and multi-format code transformation to various production business systems.
- III. MAM shall also provide data and information support to new media businesses such as DVB, studio, IPTV and website. Media asset management system has built-in editor-in-chief office editing bill, program code management and warehouse management functions, and realizes automatic file broadcasting preparation based on program code.

5.2.10 Electronic Program Guide (EPG)

The successful bidder shall provide versatile performing EPG software which can cater for the capacity of the HE. The EPG shall have capability to get integrated to the existing systems and equipment. The EPG shall have seamless handshaking with the supplier provided STBs or other STBs from other manufacturers of similar standards. The functionalities expected are the following;

- (a) Measuring up all the DVB standards
- (b) Uniformly distributing resources, including standard codes, networks, transport streams, services, elementary streams and Events.

- (c) Supporting flexible scrambling types among services, transport streams and Events and different TSs could contain the same services to meet the service needs of EPG system around the world.
- (d) Supporting the multi-hierarchical management of scrambling of services, elementary streams and Events
- (e) Inserting subscriber's personal descriptor to different arrangements in different tables; The personnel descriptor support loading automatically; Update automatically to transport related PSI/SI tables
- (f) Supporting the browsing of the visualization schedulers of single channel, multi-channel, etc.
- (g) Supporting Event descriptor with length of 200 bytes and extended Event descriptor with length of 1024 bytes.
- (h) Supporting standard and user-defined program classification, parental rating, and cast list.
- (i) Supporting dispatching program information perfectly; supporting automatically load and dispatch playbill to ensure to update the contents of EIT in time.
- (j) Supporting assigning transport rate for each table separately and flexibly selecting the tables, including PAT, PMT, CAT, NIT, SDT, BAT, EIT, TDT and TOT, to transmit via each transport stream; Supporting selecting various descriptors in the above tables to transmit. The tables, NIT, SDT, and EIT include Actual and Other types. EIT includes Schedule and P/F types as well.
- (k) Supporting managing multiple broadcasting devices at the same time. Each device supports multiple ASI broadcasting cards to transmit transport streams at the same time.
- (l) Supporting the transportations of both ASI and IP
- (m) Supporting real-time monitoring function for broadcasting status
- (n) Having well ability of the control of the authorization and specific application log record; only the administrator has the authorization to modify the configuration of the system so that to guarantee the security of the system.

5.2.11 Intercom System

The bidder shall be expected to provide reliable Intercom system for communication between Head Ends.

5.2.12 Surveillance System

In ensuring that all Head-ends and transmitter stations are monitored 24 /7, the bidder shall propose and quote for a surveillance system. The system shall include real time video monitoring of the head-ends and transmitter stations in all the provinces. The system shall have capacity to run recording for events in order to replay.

5.3 Energy

5.3.1 Fixed Station

The sites will normally use the 240 VAC, 50 Hz, commercial supply, which may fluctuate by $\pm 10\%$. The successful bidder shall provide a back-up system configured for UPS service and with a four-hour autonomy for each of the fixed remote monitoring stations.

The energy supply system shall incorporate protective devices against voltage surges or tumbles, lightning discharges and random fluctuations.

The supplier shall abide by the current Zambian electrical code of practice in all matters related to this installation.

5.4.1.1 Diesel Engine Generating Set

- i. This specification covers the design, manufacture, supply, delivery and testing of the diesel engine driven generating set arranged for automatic starting and stopping in the event of mains failure operation.
- ii. The successful bidder shall install, provide and fix all equipment, cables, connections, etc, and all other requisite accessories needed for the safe and satisfactory operation of the plant, to the satisfaction of Purchaser.
- iii. Exhaust system supplied with industrial type silencer and flexible bellows.
- iv. Fuel system shall be set mounted enough capacity complete with accessories.
- v. Guards' protection for all rotating parts.
- vi. Manuals x 04 per engine written in English.
- vii. Given below is the specification summary:
 - (a) Rating: To be specified by the bidder
 - (b) Duty: Continuous rating
 - (c) Voltage: 380V/220V $\pm 10\%$, 3 – phase/Single phase and 50 Hz $\pm 1\%$ at a power factor of 0.8 lagging for standby applications with continuous rating.
 - (d) Mounting: Steel Skid base frame
 - (e) Starting: Electric start unit
 - (f) Cooling: Natural air or water cooled
 - (g) Noise: provide acoustic enclosure/weather protected
 - (h) Provision of voltage & frequency control systems
 - (i) Provision of auto mains failure control system
 - (j) Provision of local and remote alarm systems.
 - (k) Noise: 58db or better
 - (l) Enclosure: Indoor

Control Cubicle

- (a) The cubicle shall be front access, surface mounted type and is required to monitor the output of the Generator set.
- (b) It shall consist of the static voltage regulator, measuring instruments such as Voltmeter, ammeter, frequency meter, output circuit breaker, starter motor battery charger, local and remote alarm configuration, indications.
- (c) Latest auto mains failure control unit and hours counter
- (d) The following alarms shall be provided;
 - (i) Generator set failed
 - (ii) Low lubricating oil pressure
 - (iii) High engine temperature
 - (iv) Engine over/under speed
 - (v) High generator output voltage over load
- i. Should the fuel level in the service tank fall to the "low fuel Level" alarm point, the alarm should be indicated, self reset
- ii. AC input power of battery charger shall be supplied both from the Generator set and other AC source.
- iii. The starter battery charger provided shall use modern Technology
- iv. When the Generator set is running, should the following alarms occur:
 - (i) Low lubrication oil pressure
 - (ii) High engine temperature
 - (iii) Engine over speed
 - (iv) High/low generator output voltage
 - (v) overload
 - (vi) Engine over cranking i.e. on starting

Then the engine generator set shall be shut down and locked out until after resetting.

Timers

- (a) start delay - 5 seconds setting
- (b) start pulse -10 seconds
- (c) start pulse reset period-10 seconds
- (d) mains return delay -180 seconds
- (e) engine protection lockout - 4 seconds
- (f) over speed protection lockout - 2 seconds
- (g) start solenoid delay -1 second
- (h) run on timer - 6 minutes

The bidder shall provide the following in the tender proposal:

- (a) Type of Diesel engine generator and manufacturer
- (b) Fuel consumption at full load operation
- (c) Lubricating oil consumption at full load
- (d) Number of cylinders used and configuration
- (e) Effective output of AC generator at 0.8 pf lag
- (f) Efficiency of AC generator
- (g) Waveform distortion factor of AC generator
- (h) Insulation grade of AC generator
- (i) Weight and size of diesel engine generator
- (j) Electrical circuit diagram for the Generator set and control.
- (k) Detailed Maintenances, Controls and Installation

5.3.2 Mobile Station

The OB vans shall alternatively admit to commercial-energy, vehicle-system and rechargeable-battery energy supplies, for maximum application flexibility.

- (a) The system shall be capable of operating from internal vehicle-supplied power or external (240 VAC) shore power. The vehicle power system shall allow hot switching between shore power and vehicle power (and vice versa) with no interruption in equipment operation.
- (b) The system shall operate without limit (time or load) while the vehicle engine is running, without need for an auxiliary motor generator.
- (c) When the vehicle engine is not running, the system shall operate for a minimum of 3 hours from an on-board auxiliary power system, which may be battery and/or motor generator. For quiet mode operation, the system shall operate for a minimum of 2 hours on battery power alone.

6. General Requirements

6.1 General Equipment Design Requirement

- i. The successful bidder will carry out the system engineering and design in order to ensure that all the requirements of this Tender are met. The result of this activity shall be the production of the Design Document, which shall be presented at the Design Review Meeting.
- ii. The system design shall be flexible enough to meet future expansion program up to the maximum capacity without deteriorating the performance of the system.

- iii. The system shall be designed to accommodate changes and upgrades with minimum disruptive effects. The equipment and the software shall be modular, scalable and upgradable. Software updates and upgrades shall be realisable without interfering with the daily system operation. The documentation shall facilitate the hardware and software updates and the maintenance activities.
- iv. The equipment make-up shall be compact and light. The MTBF of electronic, individual units will be of the order of years. Uniformity of equipment types will be appreciated, as it will entail a simplification of the spare-part contingent and of the maintenance activities.
- v. All components and assemblies having the same manufacturer's part number shall be functionally interchangeable.
- vi. The system, the equipment and the software shall comply with the pertinent ISO qualifications and standards.
- vii. Equipment shall conform to the similar housing standards and shall preferably be integrated in one 19" slim rack (ETSI standard).
- viii. Design and construction shall be of high quality and, for the equipment, of fine finishing, the surface treatments being in accordance with established practices. Equipment units, towers, shelters and components shall be resistant to weather conditions of the three seasons that prevails in Zambia.
- ix. The transmitter station design, layout and engineering shall be standardised, applicable to all sites indistinctly, and shall provide for maximum flexibility in the redeployment of stations to other locations. The sites shall be prepared to identical installation conditions, each ready to receive a container / similar build and a mast of uniform characteristics throughout. In addition to the redeployment quality just indicated, this concept opens the option of setting up an installation-ready site with its attendant container, access and utility facilities, enabling fast deployment of the broadcasting system overnight, by merely carrying equipment and antennas to it.
- x. The equipment shall be fully based on solid-state technology. The system hardware shall be modular to have flexibility to meet any demand for expansion or modification with minimum changes.
- xi. Parts requiring dust proofing shall be protected with dust-proof covers.

6.2 *Project Management*

6.2.1 Project Method and Organization Structure

- i. The Bidder must prepare a Preliminary Project Plan describing, among other things, the methods and human and material resources that the Bidder proposes to employ in the design, management, coordination, and execution of all its responsibilities, if awarded the Contract, as well as the estimated duration and completion date for each major activity.
- ii. The Preliminary Project Plan should including the proposed Management Organization, the Work Organization, the proposed Communication Organization between the Bidder and the Purchaser, and any other involved third parties in System supply and installation, as well as the Bidder's proposed means for coordinating activities by each of the involved parties to ensure the project is delivered on time.

6.3 *Reliability*

- i. The performance of individual components, units of equipment and the system as a whole shall ensure very high standard of reliability and stability.
- ii. The bidder shall, as part of his proposal, submit the guaranteed Mean Time Between Failure (MTBF) in hours for the various components of equipment. Bidders are required to show how the MTBF figures are calculated.
- iii. The equipment and the system shall satisfy the reliability requirements of Table 1.8. Besides featuring high reliability, the equipment and the system design shall achieve efficiency in the maintenance routines and the repairs, supported by built-in-testing (BIT) provisions throughout. The concept shall be fault tolerant, a failure of one part being containable to its domain without propagating to the remainder of the system, which will be able to continue performing through the reconfiguration of sites, equipment and functions.

TABLE EQUIPMENT RELIABILITY (MIL HBIS 217-F)	
UNIT	MTBF
Transmitter	15,000 hours
Remote Station (excluding GUI, but including processor)	8,000 hours

Table 1.8: Specification of Mean Time

6.4 *Environmental Conditions*

The equipment units shall comply with environmental and mechanical stipulations in accordance with three classes of environment, depending on the unit application: office, remote shelter, and outdoor/mobile. These classes will call for limits that reflect the meteorological characteristics and the road conditions in Zambia, as given in Table 1.9 below. The bidder shall state in its offer the temperature, humidity and vibration constraints of its various types of units and shall demonstrate that such constraints fit within the aforementioned class limits, as applicable.

TABLE 1.9: ENVIRONMENTAL REQUIREMENTS			
Parameter	Class of environment		
	Indoor, office or shelter	Outdoor	Mobile
Temperature			
Operating (guaranteed performance)	0 to 40 °C	-10 to 60 °C	-10 to 60 °C
Storage	-20 to 65 °C	-20 to 65 °C	-20 to 65 °C
Humidity	Up to 80%	95% @ 40 °C	95% @ 40 °C
Altitude	60 to 3,500 meters	60 to 3,500 meters	60 to 3,500 meters
Other		Exposed to sun and dusty environments	
Vibration DIN IEC68-2-6 , sinusoidal			5-55 Hz, 0.15mm 55-150 Hz, 0.5 g
Vibration DIN IEC 68-2-36, random MIL-STD 810C			10-500Hz, 1.9 g 5-200 Hz, 1.5 g
EMI/EMC	MIL-STD 461/462 – EN 50081/82		
Other applicable standards: MIL-STD 810 D, E, and ETS 300-019			

6.5 Civil works and Associated Infrastructure

- i. The Contractor shall supply and install towers and equipment containers for Greenfield sites with all the associated civil works.
- ii. The contractor shall propose the height of the towers according to the requirements of the radio access network.
- iii. Purchaser shall be responsible for the following land acquisition and extension of commercial AC power supply, where possible, as will be determined in the survey.
- iv. The Contractor shall be responsible for complete site building including:
 - (a) Building of engine and air conditioner bases (if required) in Greenfield sites
 - (b) Construction of palisade fence and gate.
 - (c) Guard House
 - (d) Landscaping/earthworks

- v. All design details of the proposed earthworks, fence and Guard house shall be given in the technical proposal and quoted in the BoQ as options per site.
- vi. The bidder shall state in its offer the minimum area requirements per site based on the designed shelter / housing, antenna and earthing-system layout data and other relevant recommendations.
- vii. The bidder shall offer and construct a palisade fence around each site.
- viii. The successful bidder shall also offer and fill the sites areas with crushed stones. The fill shall be of not less than 12cm deep.
- ix. The structures in general will feature provisions for vandalism deterrence.

6.5.1 Equipment Shelter

- i. The remote, transmitter sites shall include a shelter to house the transmitters and the auxiliary equipment. The shelters shall be properly protected against insects and rodents, weatherproofed, protected against electrical discharges, and protected against theft and vandalism, including pertinent alarm systems.
- ii. In addition to the equipment rack, each shelter shall accommodate a working desk and stool, and shall be adequate for occasional attended operation and for maintenance tasks. Also, the shelter / housing shall include a filing and storage cabinet for the storage of documents and of essential supplies and parts. Liquid cooling system shall be used in all transimtter stations.
- iii. The container shall be a rugged weather proof telecommunications equipment room. The Bidder shall submit the specific design details of the containers proposed, complete with drawings and pictures of the outside and inside views.

6.5.2 Towers

The Bidder shall be required to quote for the construction of support infrastructure that includes towers on sites without adequate space and Greenfield.

Structural standards for steel antenna towers shall be according:

- (a) Tower and Masts – Manufacturing SABS 0162: 1- 1993
- (b) Design Code SABS 0160 – 1989
- (c) Steel SABS 0162 W 300
- (d) Galvanising SABS 763/1997

In all cases, the specifications in this standard shall be applied unless they are superseded superior specifications.

Summary of self-supporting tower structural specifications

- 1. All the towers be galvanized to a minimum thickness of 85mm

2. Reinforced concrete shall be used for the foundation and the characteristic strength of the foundation shall not be less than 20 N/mm² (MPa)
3. The towers shall be self-supporting towers of triangular or square base with dimensions dependent on the height of the tower to be proposed according to the requirements from the radio access network plan.
4. Each tower leg shall be bonded to a tower earth ring.
5. The tower down conductor shall be 70mm² stranded copper cable and no bends in this cable shall exceed 45°. It shall be terminated on the lightning spike.
6. The tower shall have Aircraft Warning lights at intermediate and top points and shall be switched on permanently.
7. Internal rest-landings/platforms shall be installed at every interval not exceeding 10 meters of vertical climb.
8. Working/rest landings shall have guard/safety rails all around the perimeter of the platform.
9. All working and climbing facilities on the tower shall be designed to support minimum load of 250Kg and 250Kg/m² for platforms.
10. All towers shall have lightning rods/spikes installed at the very top of the mast and is to extend not less than 1.5m above the tower.
11. All towers shall have climbing/access ladders installed along the entire length of the tower. Either inside or outside mounting shall be adopted. The ladder rungs shall be evenly spaced with a minimum spacing of 250mm and width of 350mm.
12. Safety hoops shall be installed along the climbing ladders. The Diameter of safety hoops shall be between 700mm – 750mm.
13. Rack for running wave guide/feeder cables from any height on the tower to the base of the tower shall be provided.
14. Horizontal feeder cable trays/rack shall be extended to the equipment room/containers as horizontal cable runways.
15. The tower painting shall be done with alternate bands of red and white paints.
16. The tower to be supplied shall have special warrant for a minimum of 20 years.
17. A plate indicating the name of the Site, tower serial number, manufacturer's identity, year of manufacture/construction and the maximum load capacity of the tower shall be supplied for display at the bottom of the tower.
18. Detailed design documentation for towers and foundations shall be included in the technical proposal to be submitted by the bidder with the following data:
 - i. Analysis of the tower under maximum loading (survival conditions) with reference to antennas, poles, etc.
 - ii. Complete site earthing system design drawings for the tower including the materials to be used.

6.6 Earthing

- i. The supplier shall verify the existing values of the earthing resistance and shall advise Purchaser if any improvement is required. The Purchaser shall carry out the improvement work.
- ii. The design of equipment shall take into consideration that it may be installed in areas with high incidence of lightning strikes. The Bidder shall state protection measures taken to prevent damage of equipment.
- iii. All transmitter stations shall have an earthing system, following the best practices, in order to protect the operating personnel and the equipment. The earthing resistance shall not exceed 2Ω . In particular, for the case of transmitter sites, both tower and building earthing shall be jointly considered in the design. Recognised codes of practice, for instance, those applied by telecommunications operators in the country, shall be respected. Electrical and coaxial cable ingress to the shelters shall have protective, discharge devices.
- iv. The antennas, external structures and electronic equipment shall be protected against lightning by means of lightning-arrester devices, earthing drops, passive circuits and connections which effectively short high voltage transients to ground and reduce damage to active circuits.

6.7 Documentation

The successful bidder shall supply:

- (a) Documentation for all the equipment and services to be supplied. The documentation shall provide sufficient information for full comprehension of the software and hardware features of the system and for its proper operation and maintenance.
- (b) General documentation, as-built drawings, detailed descriptions of Operation and Maintenance Manuals, drawing and other necessary documentation for each appropriate unit of the proposed equipment.
- (c) The as-built system drawings and diagrams, reflecting the installation up-dates in order to register any discrepancies between the original documents and the actual implementation.

The drawings and diagrams must at least include:

- (a) Floor and elevation plans
- (b) Wiring diagrams with details of panels, connection points, cables, and energy, audio and video and RF connection and distribution boxes

- (c) Functional and operation software diagrams, database structure diagrams, database dictionary, data type structures, data definitions and logical relationships.
- (d) System diagrams including the system overall functional profiles, the location of the hardware and software resources, the logical relationships between them, the location of the human and operational interfaces, the operational flow diagrams, etc.

All documentation and human interfaces shall exclusively use the English language

6.7.1 Operation and Maintenance Manuals

The successful bidder shall supply the following operation and maintenance manuals, in the English language:

- (a) System Manual, four hard copies plus electronic version
- (b) Transmitters Manual, four hard copies plus electronic version
- (c) OB van and their associated accessories Manual, four hard copies plus electronic version
- (d) Equipment and Unit Manuals, four sets plus electronic versions

The Bidder shall detail, in its offer, the organisation of the manual package and the number of volumes per Manual.

6.8 General Tools, Testers, and Measuring Equipment

- i. The bidder shall include in its offer the tools and instruments that are required in order to properly maintain and operate the system and hence must be part of the mandatory proposal items.
- ii. The Bidder shall supply a separate list per system & per Head-End and quote for all essential "Tools, Testers and Measuring Equipment" for proper operation and maintenance of the system.

6.9 Spares

- I. The bidder shall quote for supply of a stock of adequate spares for proper and efficient operation of the system over a period of three (3) years. All modules/cards that are critical and necessary for resolving common problems should be supplied.
- II. The stock quantities to be included and priced shall be based on calculations based on the following input data: failure rates, time to repair, local or factory repair cycle, and delay to repair/recover a faulty part removed from service.

The output of the calculation will be the probability that the system runs out of spares and the impact of such event on the availability of the system functions.

- III. The bidder shall state in its offer the part failure rates based on individual-component λ 's (fits) or on documented part field-performance. The bidder shall define the maintenance unit-level at which replacements will be effected (for instance, replacement at the level of a whole receiver or of just a receiver card) and shall submit a maintenance philosophy and plan that will consider the system MTTR, and the delays associated with site, Lusaka-local and factory faulty-part repairs.
- IV. The purchaser's requires that the system meets minimum availability conditions, such conditions in turn calling for the ability of the stock of spares to make up for the faulty-part repair times. Further, the replacement level philosophy indicated in these calculations must be consistent with the MTTR that the bidder will use for the establishment of its system availability. The documentation and proof of assumptions related to the establishment of the stock size is paramount in the price comparison exercises, as part of the bid evaluation. The purchaser will review the adequacy of the stock and the results of the maintenance philosophy in terms of failure rates, time to repair and availability after the one-year warranty period.
- V. The bidder shall guarantee availability of spares for a minimum period of 10 years after the acceptance. The Bidder shall indicate the number of years that it can ensure availability of spares, per category since this information will be taken into account in the bid-evaluation process. The successful bidder will be required to notify of any discontinuance in spare availability.
- VI. The successful bidder shall advise the purchaser well ahead of time if the production of the purchased equipment is to be terminated due to technology change or any other reason so that the purchaser can hold adequate stock of spares. The bidder shall guarantee that this will not happen in the first 10 years of the equipment life. Any deviation shall be clearly indicated in the proposal.
- VII. Notwithstanding the above, in the event of the termination of production of an O&M's spare part, the supplier shall guarantee that it shall support the purchaser in the identification of proper substitutes or in the establishment of economically efficient work-around solutions.

6.10 Spare Parts Guarantee

The Bidder shall provide a separate guarantee form to the effect that, he shall guarantee the flow and availability of all spare parts and units with or without major

design changes during the life time of the system i.e., at least 10 years from the issuance of Final Acceptance Certificate (FAC).

6.11 Warranty

The Bidder warrants that the equipment to be supplied under the contract will be new and unused and complies in all respects with the quality and specifications stipulated in the technical specification. If the goods are found not compliant with the stipulations the technical specification in the contract, the Purchaser has the right for free replacement with new goods, replenishment of shortage. All losses and expenses, such as inspection charges, freight for returning the goods and for sending the replacement, insurance premium, interest, storage and loading and unloading charges etc., shall be borne by the Contractor.

The successful bidder shall be responsible for the proper operation of the system and for its maintenance, as well as for the supply of the required spare parts, and will assign a resident specialist during the period. This specialist shall have to have been employed by the supplier for at least three years.

The warranty period of the System shall be twelve (12) months commencing on the date of Provisional Acceptance. During this period, the Contractor warrants that the System, including its spares shall be free from defects in material, workmanship and design, and shall conform fully over the design life (to be defined by the Bidder), to the requirements of the Contract or such other performance levels agreed upon as acceptable by Purchaser and that no pattern of failure or pattern of degradation shall develop that is likely to cause the System to fail to meet the requirements of (Technical Specification) over the design life.

- a) The Contractor shall promptly perform any repair required to restore the System to the requirements of the Contract or such other performance levels agreed upon by Purchaser, if the System should fail to meet such requirements at any time during the warranty period or has developed a pattern of failure or pattern of degradation that is likely to cause the System to fail to meet such requirements.
- b) The Contractor shall bear the total cost of each repair required during the warranty period.

Any defective part repaired or replaced during the warranty period shall itself be subject to a further warranty period of twelve (12) months.

If during the warranty period defects are found on repeated occasions in any part or parts of the System or if a pattern of failure or pattern of degradation is likely to cause any part or parts to fail to meet the specified requirements over the design life, such part or parts shall not be repaired but shall be replaced by new part(s) at the request of Purchaser, including all the appropriate spares.

For the purposes of this Clause, a failure or pattern of degradation shall be deemed to exist if :

- a. Purchaser has notified the Contractor that in their reasonable opinion failures or defects of the same or similar mechanisms have occurred which show a deterioration of System performance that will render the System outside its specification during its design life, and
- b. the Contractor, having carried out investigation, cannot demonstrate to the reasonable satisfaction of Purchaser that :
 - (i) the failures/deteriorations are within the predictions of the reliability model or MTBF figures;
 - (ii) the failures/deteriorations are not due to a design defect in the component or its application; or
 - (iii) the failures/deteriorations only apply to a limited number of parts, for example, as a result of a manufacturing (or batch) related inconsistency; or
 - (iv) the root cause of the failures/deteriorations is fully known and understood; and
 - (v) the expected impact and magnitude of the failures/deteriorations on future System performance will be eliminated.

The investigation into the cause of any failures/deteriorations and any associated remedial action shall be carried out by the Contractor within a reasonable time-scale with regular progress reports as requested by Purchaser.

The Contractor shall make every reasonable effort to minimise the period of time that the System is out of service for repair and testing. For failures or any situations which cause or risk to cause an outage of the System, the Contractor undertakes to initiate a corrective intervention immediately but in any case no later than two (2) days after receipt of a notice from Purchaser.

The Contractor shall effect all repairs of the System through the use of repair materials supplied by it. However, the Contractor with the agreement of Purchaser may use the materials needed to effect a repair from Purchaser's available spare materials, components or equipment. The Contractor shall replace, in kind, within a period of six months, such material supplied from Purchaser's spare stock.

The repair or replacement of any faulty unit or equipment includes the delivery to Purchaser of a descriptive report of the fault found and, when appropriate, of the repair carried out on such faulty unit or equipment.

6.12 Maintenance Support

- I. The successful Bidder may be required to operate the system after acceptance for a period to be agreed with the Purchaser in order to allow for efficient operation and transfer of skills. The Bidder is therefore required to quote and submit a proposal for build operate and transfer.
- II. Post Guarantee Maintenance Assistance (Subsequent "On Demand Maintenance Support". This is not a Yearly Maintenance Assistance service). The Bidder shall provide a separate and detailed price quotation (on unit basis of hardware/software repair, man-day and per journey etc.) and terms & conditions for maintenance support, to be provided on demand to the Purchaser, after the end of warranty period and up to the life-time of the system. It shall also include Telephonic assistance. This shall be the basis for the maintenance agreement that would be signed at the end of the warranty period and shall be effective from the date of signing.

6.13 Project Start-up and Acceptance

The project execution and Acceptance starts with a Design review Meeting, scheduled to occur early in the Project development and before the shipment of the equipment. The sequence of acceptance events is:

- Design Review Meeting
- Factory Acceptance Testing (FAT)
- Shipment of Equipment
- Installation check-up
- Initial Tests
- Provisional Acceptance Testing (PAT)
- Final acceptance

6.13.1 Design Review Meeting

The Design Review Package shall be submitted to the purchaser at least two weeks before the Meeting. The purpose of the meeting is to demonstrate, by means of design reports, analyses and prototype tests, that the system that has been designed to satisfy every requirement of the specification.

6.13.2 Factory Test (FT)

There shall be a Factory Test (FT) for the system supplied Subsystem. The FT includes production tests, as well as tests on a factory system mock-up that includes, as a minimum, mobile station and a fixed station. The supplier shall demonstrate compliance with the equipment and system functional and performance specifications. The supplier shall propose the FT Test Plan for acceptance by the

purchaser. The Test Procedure shall be delivered to purchaser one week before the test and shall include the witness and conformance sheets to be signed by the purchaser.

6.13.3 Installation Check-up

The installation check-up consists of the verification of the security and the integrity of the installations. The successful bidder shall carry out these verifications in the presence of the purchaser, who may request additional visual examinations.

6.13.4 Provisional Acceptance Test (PAT)

- I. Upon completion of the Installation of the system, the Contractor will notify the Purchaser thereof and invite in writing the Purchaser to have the Provisional Acceptance Tests (PAT) carried out in order to check that the system complies with the Technical Specifications.
- II. Acceptance Tests shall be performed by the Contractor's personnel in presence of Purchaser's representative when the Equipment is ready for provision of services. The Acceptance Tests shall be based on a mutually agreed acceptance manual.
- III. Before acceptance of the installed equipment, on site, detailed tests of all equipment will be conducted to ascertain their working reliability, concurrence to technical and other specifications, inventory checking of installed equipment etc. Such tests shall be termed as "Provisional Acceptance Test (PAT)". Prior to commencement of such tests, the contractor shall submit a proposed procedure for the PAT to be subsequently approved by Purchaser. The PAT will be done by a joint team of Purchaser's Engineers and the Contractor's Engineers. The contractor shall be solely responsible for the test and the test results.
- IV. Provisional Acceptance Test shall satisfy all the requirements stated in the Technical Specification. If any portion of the work fails to pass the test, the Contractor shall quickly correct the failure and test of the said portion shall be repeated under the same terms and conditions.

6.13.5 Provisional Acceptance Certificate (PAC)

The System Provisional Acceptance Certificate will be issued by the Purchaser provided that:

- (a) The results of the tests of the System Acceptance Test Programme indicate compliance of the System throughout its Design Life with the requirements of the Technical Specification.

- (b) The Contractor has provided all the deliverable items required by the Contract (except those which do not affect the normal operation and maintenance of the System, if any).
- (c) Nothing has developed that is likely to cause the System to fail to meet the requirements of the Technical Specification or other performance requirements which have been agreed between the Purchasers and the Contractor for the Design Life.
- (d) Upon successful completion of the PAT for any, many or all equipment covered by this purchase, Purchaser shall issue a "Provisional Acceptance Certificate" (PAC) for the equipment concerned. The exact breakdown of the purchase into various PAC components and the number of PACs to be issued shall be agreed upon between Purchaser and the bidder during contract negotiation.

6.13.6 Final Acceptance Test (FAT)

- (a) At the end of the "Guarantee Period", the overall performance of all equipment will be reviewed and this review shall be termed as "Final Acceptance Test (FAT)".
- (b) The review shall include (but not limited to) the required working reliability and performance standards of the equipment to meet tender specifications, the bidder's responsiveness to resolve all shortcomings mentioned in PAT reports and the bidder's removal of all pending & outstanding fault or shortages encountered during the guarantee period.

6.13.7 Final Acceptance Certificate

One Final Acceptance Certificate (FAC) covering the entire purchase will be issued by the Purchaser after the expiration of the Contractor's Guarantee Period provided that, at the expiration of the Contractor's Guarantee Period,

- a) All outstanding issues have been resolved.
- b) The results of the Final Acceptance Tests indicate the compliance of the System with the requirements of the Technical Specification or the System fully meets such performance requirements as may be agreed between the Purchasers and the Contractor.
- c) No pattern of failure or pattern of degradation has developed that is likely to cause the System to fail to meet the requirements of the Technical Specification or such other performance requirements which may have been agreed between the Purchasers and the Contractor for the fifteen year design life of the System.

6.13.8 Final System Commissioning

The systems shall, generally, be put into commercial service after successful completion of the PAT described above. But Purchaser shall reserve the right to put any or all portion of any or all systems to commercial service, under special circumstances, even if such portion(s) have not successfully passed the PAT. Under such circumstances, the bidder shall not be relieved of his responsibilities of successful completion of the PAT for the relevant portion(s).

6.14 *Transportation of Equipment and Materials to Site*

The bidder shall transport all equipment and materials from the port of entry to the central storage areas and from the central storage areas to project sites in Lusaka, Kitwe, Livingstone and transmitter stations indicated in table 1.6 above, prior to commencement of the project roll out.

6.15 *Training*

- I. The bidder shall include in its offer training for the purchaser's engineers, specialists and technicians that will take on the system responsibility. The training curriculum shall be sufficient to facilitate transfer of technology for planning, designing, expanding and proper operation & maintenance of all the systems elements covered by this purchase.
- II. The training programs shall incorporate both classroom instruction and equipment familiarization, followed by hands-on practice for operation and maintenance and fault locating.
- III. The bidder's cost shall provide for all the attendant items, including travel fares, instructor fees, trainee manuals, presentation materials, projectors, demonstration units, multimedia aids, logistic support and any others required by the successful bidder to impart the training. The main part of the training will take place in Lusaka, the purchaser will provide the classroom and desk facilities only. Additionally, appended to the factory acceptance tests and immediately preceding them, the supplier will organise, at its premises factory on-the-job training program for at least ten engineers, the exact number will be agreed prior to concluding the contract based on the unit prices offered in the bid. The bidder shall quote itemised cost elements in the price-forms that cover the project-associated services.
- IV. In its offer, the bidder shall describe the training courses, including hands-on workshops and formal lectures. The bidder's careful plan to transfer the key concepts and abilities, in order to realise the system's full potential when left

to the independent responsibility of the purchaser's staff, shall be key and highly regarded.

7. Labeling and Packaging

The successful bidder shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract.

Annex I: Studio Centres requirements

General requirements for studios at all the Head-ends

Item	Specification	Quantity
LUSAKA STUDIO CENTRE REQUIREMENTS(
1	<p>4x CAMERA CHAIN</p> <ul style="list-style-type: none"> • HD/SD capable camera system <ul style="list-style-type: none"> ○ SDI Output ○ HD/SD-SDI Input ○ Signal Format : Selectable from 1080i/50, 720p/50 ○ Prompter output or Genlock Input ○ XLR 3-pin audio input x2 ○ Line/Mic/ +48 V Selectable ○ Earphone • Camera Control Units (CCU): <ul style="list-style-type: none"> ○ Assignable buttons ○ Intercom I/O & control block ○ Camera power indicator ○ Panel lock switch ○ HDMI monitor output ○ Trunk connector (RS-232C) ○ Reference input ○ Prompter input ○ Ethernet port • Accessories <ul style="list-style-type: none"> ○ With Colour LCD View Finder ○ Tripod adaptor • Pedestal for each studio <ul style="list-style-type: none"> ○ Capable of supporting 100kg ○ Steering Ring ○ Maximum height at 160cm ○ Total Weight – 150kg 	4
2	<p>2 x CAMERA CHAIN</p> <ul style="list-style-type: none"> • HD/SD capable camera system <ul style="list-style-type: none"> ○ SDI Output ○ HD/SD-SDI Input ○ Signal Format : Selectable from 1080i/50, 720p/50 ○ Prompter output or Genlock Input ○ XLR 3-pin audio input x2 ○ Line/Mic/ +48 V Selectable ○ Earphone • Camera Control Units (CCU): <ul style="list-style-type: none"> ○ Assignable buttons ○ Intercom I/O & control block ○ Camera power indicator ○ Panel lock switch ○ HDMI monitor output ○ Trunk connector (RS-232C) ○ Reference input ○ Prompter input ○ Ethernet port • Accessories 	1

	<ul style="list-style-type: none"> ○ With Colour LCD View Finder ○ Tripod adaptor • Pedestal for each studio <ul style="list-style-type: none"> ○ Capable of supporting 100kg ○ Steering Ring ○ Maximum height at 160cm ○ Total Weight – 150kg 	
4 WIRELESS SD CAMERA LINK		
3	<ul style="list-style-type: none"> • Transmitter System <ul style="list-style-type: none"> ○ HD/SD Camera Transmitter : SD-SDI, ASI ○ Modulation : COFDM ○ Bandwidth : 5,6,7 & 8 MHZ ○ Input Formats: PAL, SDI ○ Frequency Band- 2GHz ○ Bandwidth – 400MHZ ○ Maximum Output Power- 100Mw • Omnidirectional Linear Flexi <ul style="list-style-type: none"> ○ Gain: 3dBi ○ Bandwidth – 700MHZ • Receiver System <ul style="list-style-type: none"> ○ Demodulation: COFDM ○ Bandwidth: 5,6,7,8 MHZ • Down Converter Mini <ul style="list-style-type: none"> ○ Frequency range : 2.0 to 22.7GHZ ○ Noise Figure < 1.5Db ○ Conversion Gain > 25Db • Sector Antenna 2GHZ, <ul style="list-style-type: none"> ○ Frequency band : 2GHZ ○ Bandwidth – 500MHZ ○ Gain: 13dBi ○ Radiation pattern : 90 H – 20 V • Active IF Distributor <ul style="list-style-type: none"> ○ Frequency Range: 50MHZ to 1GHZ ○ Number of Outputs – 4 ○ Level of Outputs: Same as input level • Intercom Base Station <ul style="list-style-type: none"> ○ Digital • Intercom Mobile Radio 	1

	<ul style="list-style-type: none"> ○ UHF Mobile radio • Omni UHF Intercom Base Station <ul style="list-style-type: none"> ○ Bandwidth- 50MHZ ○ Gain: 2dBi 	
PORTABLE DATA TERMINAL(COMPLETE SYSTEM – TX & RX)		
4	<p>Features :</p> <ul style="list-style-type: none"> • X, Ka and Ku bands • 60cm reflector • Fully integrated man portable design • Interchangeable modem options • 5Mbps data rate • Graphical interface control <p>X-Band Specification</p> <ul style="list-style-type: none"> ○ Tx Frequency Band.....7.9-8.4 GHz ○ Rx Frequency.....7.25-7.75 GHz ○ EIRP (sat) @ 8.15GHz.....45.3 dBW ○ G/T @ 7.5GHz.....10.1 dB/K ○ Polarisation..... ○ Tx – RHCP or LHCP configurable ○ Rx – Orthogonal to Tx ○ Axial Ratio.....<2dB (Tx), <1.21dB (Rx) ○ Tx Spurious (Carrier Related)..... <-60dBc ○ Tx Spurious (Non Carrier Related)..... ○ <-60dBm ○ Intermodulation Products.....<-25dBc ○ SSPA Power.....25W ○ Sidelobes.....MIL-STD-188-164A <p>Ka-Band Specification</p> <ul style="list-style-type: none"> ○ Tx Frequency Band.....30-31 GHz (Option 29.5 – 31GHz) ○ Rx Frequency Band.....20.2-21.2 GHz (Option 18.7GHz – 20.2GHz) ○ EIRP (sat) @ 30.5GHz.....55.3dBW ○ G/T @ 20.7GHz.....17.7dB/K ○ Polarisation..... ○ Tx – RHCP or LHCP configurable ○ Rx – Orthogonal to Tx ○ Linear (Option) ○ Axial Ratio.....<1.0dB (Tx), 1.5dB (Rx)dB ○ Tx Spurious (Carrier Related)..... <-60dBc ○ Tx Spurious (Non Carrier Related)..... <p><-70dBc</p> <ul style="list-style-type: none"> ○ Intermodulation Products.....<-25dBc ○ SSPA Power.....16W ○ Radiation Pattern Compliance..... ETSI EN 301.358 MIL-STD-188-164A ITU-R S.465.5 and S.580-6 FCC 25.209 <p>Ku-Band Specification</p> <ul style="list-style-type: none"> ○ Tx Frequency Band.....13.75 – 14.5 GHz ○ Rx Frequency Bands.....10.95 – 11.70 GHz 11.70 – 12.20 GHz 12.25 – 12.75 GHz ○ EIRP (sat) @ 14.125GHz.....50.2dBW ○ G/T @ 11.7GHz.....14.1dB/K 	10

	<ul style="list-style-type: none"> ○ Polarisation.....Linear H/V ○ Tx orthogonal to Rx ○ Axial ratio..... ○ <20 (29dB cross polar isolation) ○ Tx Spurious (Carrier Related)..... ○ <-60dBc ○ Tx Spurious (Non Carrier Related)..... ○ <-70dBc ○ Intermodulation Products.....<-25dBc ○ SSPA Power.....20W 	
5	190CM PORTABLE DATA TERMINAL(Complete System)	
	Features <ul style="list-style-type: none"> • C-Band <ul style="list-style-type: none"> ○ Transmit Frequency : 5.85GHZ ○ Receive Frequency : 3.4GHZ ○ Gain:39.15dBi@5.85GHZ ○ Linear Polarisation 1 tx port, 1 rx port / Circular-LH/RH CP ; Tx port LH, rx port RH ○ Power(W) CW: 650 • Ku-Band <ul style="list-style-type: none"> ○ Transmit Frequency: 13.75 GHZ ○ Receive Frequency : 10.7GHZ ○ Gain: 46.3 dBi ○ Polarisation : Linear Orthogonal/ Circular ○ Feed: 1 tx port, 1 rx port • Azimuth <ul style="list-style-type: none"> ○ $\pm 90^\circ$ with segment case fixed to mount case ○ $\pm 90^\circ$ with mount case sited independently of the segment case • Elevation <ul style="list-style-type: none"> ○ 0 to 90° to 0 • Polarisation : $\pm 95^\circ$ 	1
6	Teleprompter for each studio Camera <ul style="list-style-type: none"> • Auto Tele Prompter Software Complete with Q Box with BNC, SDI and VGA Output • Foot Control for Wincue Multi-button Hand Control • MSP 17" on Camera Unit Complete with Hood, Glass, Bracket, Cables & fixing Plate • USB Hand Control With Forward/Reverse and Marker Buttens • Computer (PC) with PCIE or PCIX slots 21" LCD Computer Monitor	10

7	ON AIR SERVER SYSTEM (with active redundancy) 1 + 1 MULTI FORMATS DV25 MPEG2/4 + AUTOMATION <ul style="list-style-type: none"> • 4GB RAM • HDD-2TB • 20" TFT Monitor • SDI- I/O , Composite I/O Cards • KVM Extenders • CG application as part of the playout Annual Software Maintenance and standard technical Support	12
8	Networked NEWS Edit Stations <ul style="list-style-type: none"> • RAM 4GB or better • HDD- 2 TB • SDI- I/O , Composite I/O Cards • Tape Drives / DVD for external back up • Adobe Premiere Pro Editing Software 	8
9	Networked NEWS Edit Stations <ul style="list-style-type: none"> • RAM 4GB or better • HDD- 2 TB • Tape Drives / DVD for external back up • SDI- I/O , Composite I/O Cards • Final Cut Editing Application 	8
10	VIDEO ARCHIVING <ul style="list-style-type: none"> • Networked Attached Storage capacity 100TB • LTO Video Archiving Recorder for 5 yrs storage 	2
11	NETWORKED EDIT STATIONS Video Editing Software (Adobe Premier Pro) Workstation <ul style="list-style-type: none"> • 4GB RAM • 20inch TFT Monitor • HDD: 4TB • Quad Core Processor, • DVD Super Multi Drive • IEEE 1394 PCI Card • SDI- I/O , Composite I/O Cards • Stereo powered speakers PC I Interface Card with SDI I/O and Composite video I/O	30
12	NETWORKED EDIT STATIONS <ul style="list-style-type: none"> • 4GB RAM • 20" TFT Monitor • HDD: 4TB • Quad Core Processor, • DVD Super Multi Drive • IEEE 1394 PCI Card • Final Cut Video Editing Application • Stereo powered speakers PC I Interface Card with SDI I/O and Composite video I/O	12
13	SCHEDULING MACHINE 20" Dual Display, Quad Core Processor, 4GB RAM, 4 TB- HDD	8

14	PROFESSIONAL CG SYSTEM <ul style="list-style-type: none"> • Advanced Character Generation • Windows-Based System • Supports Multiple Resolutions & Formats • 24-Bit Color • Animation capable • Character Attributes & Style Galleries • Multiple Typefaces • Digital Time Display • Logo Customization • Title Composer • Display List Editor • Banner Crawl 	8
15	WIRELESS STUDIO MICROPHONES SYSTEM COMPLETE WITH TX/RX AND ACCESSORIES <ul style="list-style-type: none"> • RF Output -50Mw • S/N > 100dB • Carrier range- 470 to 870MHZ • Maximum Deviation 75khz • Distortion < 0.3% • Phase reversible • Rechargeable batteries • Long battery life approx.. 6 hrs 	180
16	STUDIO MICROPHONES (Condenser) <ul style="list-style-type: none"> • RF Output -50Mw • S/N > 100dB • Carrier range- 470 to 870MHZ • Maximum Deviation 75khz • Distortion < 0.3% • Phase reversible • Rechargeable batteries • Long battery life approx.. 6 hrs 	180
17	STUDIO MICROPHONES (Dynamic) <ul style="list-style-type: none"> • RF Output -50Mw • S/N > 100dB • Carrier range- 470 to 870MHZ • Maximum Deviation 75khz • Distortion < 0.3% • Phase reversible • Rechargeable batteries • Long battery life approx.. 6 hrs 	180
18	Tapeless Video Cameras: ENG <ul style="list-style-type: none"> • HD/SD capable • Video out: BNC,HD-SDI/SD-SDI/HD-SDI/SD-SDI: 0.8 Vp-p, 75Ω • Composite: 1.0 Vp-p, 75Ω • Monitor out: BNC x 1, HD-SDI/HD-Y switchable, HD-SDI: 0.8Vp-p, 75Ω, HD-Y: 1.0Vp-p, 75Ω • Signal Format : Selectable from 1080i/50, 720p/50 • Utilises at least two(2) 32 GB Flash memory card 	60

	<ul style="list-style-type: none"> Capable of recording at least 120mins 6-pin x 1, IEEE 1394 standard digital Interface XLR Interfaces Complete kit of camera accessories including tripods, Hard carrier case, Four Channel Charger, Tripod adaptor 	
19	Video Cameras <ul style="list-style-type: none"> HD/SD capable Video out: BNC,HD-SDI/SD-SDI/HD-SDI/SD-SDI: 0.8 Vp-p, 75Ω Composite: 1.0 Vp-p, 75Ω Monitor out: BNC x 1, HD-SDI/HD-Y switchable, HD-SDI: 0.8Vp-p, 75Ω, HD-Y: 1.0Vp-p, 75Ω Signal Format : Selectable from 1080i/50, 720p/50 Utilises at least two(2) 32 GB Flash memory card Capable of recording at least 120mins 6-pin x 1, IEEE 1394 standard digital Interface XLR Interfaces Complete kit of camera accessories including tripods, Hard carrier case, Four Channel Charger, Tripod adaptor 	60
20	ON-AIR RECORDING SERVERS <ul style="list-style-type: none"> SDI I/O Composite Output 24x 7 x 365 storage x 3 years Tape Drives (TO) 	8
21	INGEST SERVERS (INDEXED SYSTEM) <ul style="list-style-type: none"> 20" Dual Display, Quad Core Processor, 4GB RAM, 4 TB- HDD SDI I/O Composite I/O 	12
Switcher System		
22	2 M/E HD Switcher,Includes: 2 M/E Compact Control Panel & GUI. 6U Mainframe. Consists of 40 inputs, 4 Keyers per M/E, 8 outputs and 8 Aux outputs, 8 Source Aux outputs. 3D DVE, Chroma Key, Resize Engines, Key Border, Still & Clip Store, Programmable Output, External Control, GPI/GPO's, Safe Area Generator and Mainframe and Control Panel redundant PSUs.	6
23	Virtual Studio features : <ul style="list-style-type: none"> Channels : 32 8 Simultaneous inputs Video Input : <ul style="list-style-type: none"> HD-SDI, HD Component, SD-SDI, SD Component, Y/C (BNC) or Composite HD-SDI video conforms to SMPTE 292M and SD video conforms to SMPTE 259M and ITU-R BT.656 Video Output : 	4

	<ul style="list-style-type: none"> ○ HD-SDI, HD Component, SD-SDI, SD Component, Y/C (BNC), or Composite ○ HDMI, DVI and VGA output for monitors and/or projector ○ Output sources include Program and AUX (configurable for Program, Program clean, Preview, any input, Effects, any frame store, alpha out) ● Recording : <ul style="list-style-type: none"> ○ Full HD recording of Program or AUX output in all resolutions up to 1080p ○ Multiformat Capable : MPEG 2, MPEG4-H.264 ,AVI, MP3 ○ Adjustable audio headroom ○ ISO recording of any live input or output with IsoCorder™ ○ Multi-track, multi-format video recording capability ○ Native HD/SD up to 8 simultaneous channels in all resolutions ○ Source per channel: Program output, AUX output or camera inputs ● M/E-Bus- Style Virtual Inputs: <ul style="list-style-type: none"> ○ 8 independent mix/effect-style channels, each with presets, dedicated upstream overlay channel with transition control, and independent source effects; positioning, scaling, cropping and 3D rotation ● Live Streaming <ul style="list-style-type: none"> ○ HD/SD live streaming in resolutions up to 720p (16:9 aspect ratio), with simultaneous archive ○ Streaming Profile Manager with integrated Web browser to manage or view streams, and access online CDN accounts ● Analog Inputs: <ul style="list-style-type: none"> ○ 8 SDI Embedded ○ 8 AES3/EBU ○ 8 x 2 Balanced XLR (Mic/Line) ○ Analog audio levels conform to SMPTE RP-155 ○ Phantom Power Support ● Analog Output : <ul style="list-style-type: none"> ○ Seven-band equalizer and full stereo compressor/limiter per output ● Video Processing : <ul style="list-style-type: none"> ○ 4:4:4:4 ○ 32-bit Floating Point ● Audio Processing : <ul style="list-style-type: none"> ○ 4 channels, 96 kHz ○ 32-bit Floating Point ● Supported Formats: <ul style="list-style-type: none"> ○ PAL 1080/25p, 1080/50i, 720/50p, 720/25p, 576/25i ○ NTSC/SECAM: 1080/30p, 1080/24p, 1080/60i, 720/60p, 720/30p, 720/24p, 480/60i ● Recording durations: 200hrs or better for 1080i ● Transition effects: <ul style="list-style-type: none"> ○ Animated transitions with full-color, embedded overlay, audio 	
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	<p>and alpha channel on all 11 effects channels</p> <ul style="list-style-type: none"> • Virtual Sets : <ul style="list-style-type: none"> ○ live virtual sets with multiple camera angles, animated zoom, real-time reflections and specular highlights not less than 24 sets for HD • Playback Media Formats: <ul style="list-style-type: none"> ○ Movie files: AVI, DV, DVCPro, DVCProHD, FLV, F4V, H.263, H.264, MOV, MKV, MJPEG, MPEG (1, 2 in all profiles, program or transport streams), MP4, WMV, WebM and more ○ Image files: PSD, PNG, TGA, BMP, JPEG, EXR, RAW, TIF and more ○ Audio files: AIFF, MP3, WAV and more • Import media application for batch copying with optional transcoding of files (including Apple Pro Res) • Exported Media Format : <ul style="list-style-type: none"> ○ Export media applications for batch copying with optional transcoding of files to compatible formats for different applications and devices ○ Media types: AVI, DV, DVCPro, DVD, H.264, MOV, MPEG-2, MJPEG, MP4, WebM and more ○ Presets for external NLEs: Adobe Premiere®, Avid® Media Composer®, Apple® Final Cut Pro®, and more ○ Presets for all mobile platforms: Android®, iPad®, iPhone®, iPod Touch® and more • Multiview: <ul style="list-style-type: none"> ○ Configurable for All Monitors, External Monitors, Internal Monitors • Video Ingest: <ul style="list-style-type: none"> ○ eSATA • Monitor Output <ul style="list-style-type: none"> ○ Program, Preview, Effects, Preview/Program and Waveform/Vectorscope • Tally : <ul style="list-style-type: none"> ○ DB 15 connector for 8 PGM row tally lights • Power Supply: <ul style="list-style-type: none"> ○ Provision for redundant and removable PS required 	
25	6 input Analogue to SDI converter boards	10
32x 32 HD/SD Video Router		
26	32x32 SDI Routing Switcher, w/ external power supply	4
27	Redundant Power Supply	4
28	Remote Control Panel	4
29	Programmable Contact Closure Interface, 1RU, 32 inputs/outputs	4

Video Server		
30	Digital Video Server 40 TB <ul style="list-style-type: none"> • 4GB RAM • 20" TFT Monitor • HDD: 4TB • Quad Core Processor, • DVD Super Multi Drive • IEEE 1394 PCI Card • Final Cut Video Editing Application • Stereo powered speakers PC I Interface Card with SDI I/O and Composite video I/O	4
Test Signal Generator		
31	<ul style="list-style-type: none"> • 8 video test patterns • 1 & 10KHz audio tones • 0dBu & +4dBu levels • Video & S-video outs • 2 x balanced audio out • Text book accurate • Battery powered 	8
PROFESSIONAL SPG System		
32	VIDEO GENERATOR MAINFRAME	4
33	CHANGEOVER UNIT	4
Waveform System		
34	Waveform / Vector / Sub- Carrier to Horizontal (SCH) Monitor-4 Inputs with Picture Display	10
Monitor System		
Monitor		
35	4.3" 800x480 Multi-Format Quad LCD Rack Mount. HD/SD SDI and Composite inputs with loop-Thru. 2RU x 19" rack. Embedded audio metering. Waveform/vectorscope	12
36	4.8" 800x480 Multi-Format Triple LCD Rack Mount. HD/SD SDI and Composite inputs with loop-Thru. 2RU x 19" rack. Embedded audio metering. Waveform/vectorscope	12
37	17" Multi-Format LCD Monitor HD/SD, Audio Disembeder, Internal speaker, DVI, HDMI input/output	30
38	24" Multi-Format LCD Monitor HD/SD, Audio Disembeder, Internal speaker, DVI input:	20
39	42" LCD Monitor , DVI input	30
Multiviewer		

40	Quad multiviewer + frame, DVI and HDSDI outputs. Autosensing HD (1080i/720p), SDI (625/525), Composite (PAL/), Embedded audio monitoring. GPI inputs. Features : Autosensing HDSDI, SDI, Composite, Embedded audio monitoring. GPI inputs. Fifth loop input for cascading, Ethernet, and accessories for auto sensing input , UMD/Tally and alarms	24
41	Optional second power supply for dual redundancy	10
TALLY/UMD System		
42	TallyMan ® extended UMD control system (2RU)	8
43	Under Monitor Display. Dynamic 8 Characters.	
44	Programmable source controller	
Peripheral Device		
45	Analog Video Distribution Amplifier, with 10 I/O rear connector	8
46	Single 1x8 distribution amplifier, SD/ASI non-reclocking, 2 slots	8
47	Single 1x4 distribution amplifier, non-reclocking,SD/ASI, 1 slots	8
48	Single 1x8 distribution amplifier, ASI/SD non-reclocking, 2 slots	8
49	AES Digital Audio Multiplexer, 4 channel, balanced, with double-slot rear connector	8
50	SD to Analog Video 12-bit Digital Encoder with line sync, with double-slot rear connector, with features for customizable alarms	8
51	SD-SDI A/V frame sync and processing amplifier, HD & 3D ready , includes double-slot backmodule and breakout cable	8
52	1RU Up/Down/Cross Converter & Synchronizer, Video and 16 Channel Audio, Local Control Panel, Redundant Power Supply (Dual Channel .27/1.5 Gb/s Conversion)	8
Video Tape Recorder		
53	HDCAM VTR :	50
54	HD/SD-SDI Output The HD/SD-SDI output that allows straight duplication to a deck with HD/SD-SDI input. Multi-format Playback/Recording Capability <ul style="list-style-type: none">• supports HDV native progressive recording modes and has a 60i/50i switchable function, so it can playback/record:•HDV1080i: 60i/50i/24p/30p/25p•DVCAM/DV:60i/50i•The HDV720p(24/25/30p) tape playback is available for a simple viewing.* Standard and Mini Size Cassette Tape Compatibility Supports both standard and mini size cassette tapes and accepts standard cassettes shot from other VTRs 2.7-inch Wide Clear Photo LCD plus Screen and Monaural Speaker A built-in 2.7-inch type wide Clear Photo LCD plus screen and built-in monaural speaker to allow quick and convenient checking of video and	

	audio.	
	<ul style="list-style-type: none">• Be able to convert material from HD down to SD, and output the SD video signal through its i.LINK, SD-SDI, analogue component, S-video, and composite connectors.• Should be able to down-convert signals from the aspect ratio of 16:9 to 4:3. Display modes can be selected from Squeeze, Letterbox, and Edge Crop*16.	
SD Character Generator		
55	PROFESSIONAL CG SYSTEM <ul style="list-style-type: none">• Advanced Character Generation• Windows-Based System• Supports Multiple Resolutions & Formats• 24-Bit Color• Animation capable• Character Attributes & Style Galleries• Multiple Typefaces• Digital Time Display• Logo Customization• Title Composer• Display List Editor• Banner Crawl	12
Clock System		
56	GPS Clock System Driver Unit, with GPS receiver and antenna(Master)	2
57	GPS Clock System Driver Unit, with GPS receiver and antenna(Slave)	2
58	High stability quartz crystal oscillator Clock System Driver Unit	2
59	Timecode distribution,EBU,1x12	2
60	LED Digital Clock,2RU	2
61	Clocks: to be placed in all studios.	120
• InterCom System to Link all 10 x Provincial Centres Control Rooms and TV Operational Areas.		
62	Intercom Matrix Frame. Frame with user menu and RJ-45 programmable panel/4-wire ports and 4 4-wire in/ out ports. Has Dual-redundant PSUs.	1
63	V-Series 2RU 24 Lever Key Display Panel with XLR-4 Male headset connector	
64	V-Series 1RU 12 Lever Key Display Panel with XLR-4 Male headset connector.	
65	Standard Length Mic - Gooseneck (340mm or 12 inches). for use V-Series panels	
Audio System		
Digital Mixing System		

66	Main Digital Mixing Console, Comprehensive interface with 24 touch-sensitive 100-mm motor faders. Generous mixing capacity with up to 32 simultaneous inputs and 22 mix buses	6
67	Peak Meter Bridge	6
68	Digital I/O Card for Digital Mixers, 16 AES I/O In One Card	6
69	Digital I/O Card for Digital Mixers, 8 Analog Ins + 8 Analog Outs In One Card	6
Digital Mixing System (Backup)		
70	Backup Digital Mixing Console, Comprehensive interface with 16 touch-sensitive 100-mm motor faders. Generous mixing capacity with up to 40 simultaneous inputs and 20 mix buses (20 buses: a main stereo program bus, 8 individual mixing buses, 2 solo buses, and 8 auxiliary buses) in a compact rack-size mixer.	6
71	Expansion cards for use in the option I/O slots of the digital mixers and mixing engines: Digital I/O Card for Digital Mixers, 16 AES I/O In One Card	6
Player and Recorder		
72	<p>CD Player:</p> <p>Support disk- CD-DA, CD-ROM ISO9660 Level 1/2/ROMEO/JOLIET</p> <p>Single loader</p> <p>Digital Output :</p> <p>AES-3id- BNC</p> <p>AES3-2003/AES-3id-2001</p> <p>Analog Output :</p> <p>RCA</p> <p>Output impedance – 200 Ohms</p> <p>Line Output : XLR-3-32(1:GND, 2:HOT, 3:COLD)</p> <p>CF : FAT32/16 @ 4GB</p> <p>Audio performance :</p> <p>Frequency Response- 20Hz-20kHz, ± 0.5dB</p> <p>S/N Ratio- Greater than 100dB (20kHz LPF, a-weighted)</p> <p>Less than 0.005% (+22dBu, 1kHz, 20kHz LPF)</p> <p>Phones : 6.3mm 1/4-inch stereo phone jack</p> <p>Power Consumption: 18w</p>	12
73	<p>CD Recorder :</p> <ul style="list-style-type: none"> • High-quality stereo recording at up 192kHz/24-bit or DSD format • Records to Built-in 60GB hard drive, DVD+RW, CD-R/RW media • Archives to DVD-R, DVD-RW, DVD+R and DVD+RW discs • Multiband compression and 3-band EQ mixdown effects • USB 2.0 connection to PC for use as DVD data drive • Balanced XLR and unbalanced RCA inputs and outputs • Balanced AES/EBU inputs and outputs, running at normal, double-speed and double-wire formats • SDIF-3 DSD input and output for external conversion and processing of DSD audio 	12

	<ul style="list-style-type: none">• Word Sync In, Out, Thru• RS-232C serial control• PS/2 keyboard connector for title editing																													
74	<p>Professional Broadcast Digital Telephone Hybrid Type A</p> <p>Transmit : All measurements referenced at –15dBm level on the phone line. FREQUENCY RESPONSE: +/- 1dB from 250Hz to 3.5 kHz DYNAMIC RANGE: >70dB DISTORTION: <0.15%</p> <p>Receive : All measurements referenced at –15 dBm level on the phone line with caller processing options bypassed. FREQUENCY RESPONSE: +/- 1dB from 250Hz to 3.5kHz DYNAMIC RANGE: >70dB DISTORTION: <0.1%</p> <p>19” Rack Mounted</p> <p>AES/EBU IN: XLR pin 1= ground, pin 2= +phase, pin 3= -phase; 32, 44.1, or 48kHz sample rate AES/EBU OUT: XLR pin 1=ground, pin 2=+phase, pin 3= -phase; 32, 44.1, or 48kHz sample rate</p> <p>Power : Auto Adjusting, 100-240VAC,</p>	6																												
75	<p>Professional Broadcast Analogue Telephone Hybrid Type B</p> <table><tr><td>Input Impedance – Line Mode (Clean Feed)</td><td>10kΩ balanced 0dB</td></tr><tr><td>Input Impedance-Microphone Mode</td><td>200Ω balanced</td></tr><tr><td>Clean Feed Limiting Input</td><td>+4dBu</td></tr><tr><td>Microphone Level Range by preset pots</td><td>74Db to 40Db adjusted</td></tr><tr><td>Bandwidth to telephone line ref 1kHz</td><td>250Hz - 4kHz, -3dB</td></tr><tr><td>Telephone Line Impedance:</td><td>Nominally 600Ω</td></tr><tr><td>Telephone Line Impedance Range:</td><td>300Ω to 1500Ω</td></tr><tr><td>Output Impedance: 0dBu</td><td>50Ω balanced floating</td></tr><tr><td>Output Level Range: adjusted by preset pot</td><td>+8dB to -14dB</td></tr><tr><td>Rejection Ratio:</td><td>45dB on 1kHz tone, typically 28dB on complex waveforms, reference peak level of 0dB</td></tr><tr><td>Mic/Line Input:</td><td>XLR 3 pin female with push button mic/line selection</td></tr><tr><td>Line Output:</td><td>XLR 3 pin male</td></tr><tr><td>Telephone Line:</td><td>RJ11 6/4 socket</td></tr><tr><td>Telephone Handset/Instrument:</td><td>RJ11 6/4 socket</td></tr></table> <p>19” Rack Mounted</p>	Input Impedance – Line Mode (Clean Feed)	10kΩ balanced 0dB	Input Impedance-Microphone Mode	200Ω balanced	Clean Feed Limiting Input	+4dBu	Microphone Level Range by preset pots	74Db to 40Db adjusted	Bandwidth to telephone line ref 1kHz	250Hz - 4kHz, -3dB	Telephone Line Impedance:	Nominally 600Ω	Telephone Line Impedance Range:	300Ω to 1500Ω	Output Impedance: 0dBu	50Ω balanced floating	Output Level Range: adjusted by preset pot	+8dB to -14dB	Rejection Ratio:	45dB on 1kHz tone, typically 28dB on complex waveforms, reference peak level of 0dB	Mic/Line Input:	XLR 3 pin female with push button mic/line selection	Line Output:	XLR 3 pin male	Telephone Line:	RJ11 6/4 socket	Telephone Handset/Instrument:	RJ11 6/4 socket	6
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	Power : Auto Adjusting, 100-240VAC	
PORTABLE COMMUNICATION		
	<ul style="list-style-type: none"> • Walkie- Talkie System 	
InterCom System		
76	<p>Intercom Matrix Frame.</p> <ul style="list-style-type: none"> • Frame with user menu and RJ-45 programmable panel/4-wire ports and 4 4-wire in/ out ports with Dual-redundant PSUs. • 19" rack mount Central Processor • Rack mount Ethernet based Communication Controllers to interface to the local control racks • Surge protection and lightning protection is required • Digital Voice Recording System located within an equipment rack • Alarm calls capability shall be incorporated • Tamper calls : initiated when an attempt is made to gain unauthorized access to intercom station electronics • Data Integrity: In times of power failure, the actual status information in the system at the time of the failure shall not be lost. When the power is reconnected, all status information at the time of the power failure shall be retrievable. • The System shall be capable of automatically detecting excessive Audio Levels, • The system is expected to link all the studio facilities with provision for expansion to other areas of operations 	
Other Equipment for system		
77	Broadcast Loudness Meter	10
78	D21-Master Sync Generator	10
79	Volume Controller	10
80	On-Line Broadcast Delay	12
81	Stereo Reverb/Effects Processor	10
82	AES/EBU digital audio distribution amplifier (1:4)	26
83	Analog audio distribution amplifier(mono 1:8)	26
84	2RU Frame, capable of housing any mix of signal types, including 3G\HD\SD-SDI, DVB-ASI, single- and multimode fiber optics, AES/EBU (balanced and unbalanced), analog video and analog audio.	13
85	Redundant AC power supply Multiformat Unit	13
86	DI Box	26
87	16 XLR female to 16 BNC female	
88	16 XLR male to 16 BNC female	

89	8 channels, pre-selection from 1 of 2 groups of 16 analog inputs, independent selection of 1 of 4 mono-sources to left and right output. 8 analog inputs by "Phoenix" connectors, XLR output of selected channels. 4 x 53 segment high-resolution level meters showing simultaneous PPM over VU. Push button channel selection and summing of analog channels.	13
90	1RU, Self-Powered Speaker System, 2 HD/SD-SDI Auto-Sensing Inputs on BNC, 1 Re-Clocked HD/SD-SDI Output on BNC, Front Panel Selection of any 2 of 4 SDI Groups for monitoring and conversion, Unbalanced AES/EBU Outputs on HD-15 de-embedded from any 2 selected groups of HD/SD-SDI, 4 unbalanced AES/EBU Inputs on BNC, 8 Balanced Analog Inputs on DB-25, 8 Balanced Analog Outputs of Metered Audio, 2 Analog Outputs of selected channels on XLRs, 8 x 26-Segment, High-Resolution Level Meters showing multaneous PPM over VU, LCD display of system status and Phase Correlation.	13
Monitor Equipment		
91	Two-way Active Nearfield Monitor	26
92	Compact active studio monitor	26
93	Active subwoofer	26
94	Headphone	60
Microphone		
95	short gun interference tube microphone,with Microphone wind muff,Pistol Grip,Blimp windscreen Comment:	130
96	Electret condenser lavalier microphones	100
97	Omni-Directional Handheld Dynamic ENG Microphone with Extended Handle	100
Closed Circuit Television		
98	<p>The solution should provide for complete surveillance of the broadcast station</p> <p>Features:</p> <ul style="list-style-type: none"> • 20 x Optical Zoom • Extremely low light capture • Megapixel resolution (1600 x 1200) to capture small details and better identify subjects • Quad streaming MPEG4/JPEG video • Up to 30 frames per second • Pan range of -175° to +175° • Tilt range of +90° to -23° • 4X digital zoom • Auto Pan • Auto Patrol • Preset • The recording software should allow for viewing and recording up to sixteen cameras. • Two-way audio • Micro SD card slot for local recording for 1 week • 0.2 lux minimum illumination 	3

	Storage : Capable of storing images for 3 months after which the info is achieved.	
Console and Racks		
99	Giant display wall 4 x 42" Display 5mm seam gaps between screens	4
100	Standard Video Console	4
101	Standard Audio Console	4
102	Equipment Racks based on the equipment to be supplied	
MEDIA CONVERSION		
103	Integrated Multimedia Data Management System <ul style="list-style-type: none"> • :Umatic Machines, x 6 • Betacam Machines for Conversions x 6 • Digital Catalogue Computing System, • Disk Array for Data Storage to store 6000hours of archive material, • Indexing Server System for the 6000hrs 	2
	System Integration	
104	For the audiovisual system	
OUTSIDE BROADCASTING VANS		
105	<ul style="list-style-type: none"> • State of the Art Outside Broadcast Technology • 8 Camera Chain • 3 x Slow Motion Equipment System • 32 x 32 Vision Mixer • 32 x 32 Audio Mixer • In built Power conditioning • Air-conditioned • 2 x Microwave links • 12 m x 3m x 4m (Lx WxH) Studio structure • DVD R/W 	2
REHABILITATION OF EXISTING OUTSIDE BROADCASTING VAN		
106	<ul style="list-style-type: none"> • Modernize existing OB Van to state of Art • 6 Camera Chain • 2 x Slow Motion • 32 x 32 Vision Mixer • 32 x 32 Audio Mixer • In built Power conditioning • Air-conditioned 	1

TWO(2) NEW STUDIOS FULL HOUSE		
107	<ul style="list-style-type: none"> • Build 1200m² Studio • 4 Camera Chain Studio • Professional Pedestal • Cool lighting system • All studio accessories 	2
AIRCONDITIONING SYSTEM FOR STUDIOS		
	<ul style="list-style-type: none"> • All Head – End Require Air Conditioning • Lusaka : 3 X 4 X 30 Horse Power • Kitwe: 2 x 2 x 15 Horse Power 	
GENERATOR SET		
	<ul style="list-style-type: none"> • Provincial Centres: 200KVA, Generator sets 	8
	<ul style="list-style-type: none"> • Power Conditioning for each station CVT: 	8
	<ul style="list-style-type: none"> • Portable Trailer Mounted Generator Sets- 75kVA 	2
	<ul style="list-style-type: none"> • District/Remote centres 20-50kVA 	
108	<ul style="list-style-type: none"> • Power Conditioning for each station:AVR 	8

KITWE

Item	Specification	Quantity
	KITWE STUDIO CENTRE REQUIREMENTS(12.5m x 9.5m x 4.6m) LxWxH	
1	<p>4x CAMERA CHAIN</p> <ul style="list-style-type: none"> • HD/SD capable camera system <ul style="list-style-type: none"> ○ SDI Output ○ HD/SD-SDI Input ○ Signal Format : Selectable from 1080i/50, 720p/50 ○ Prompter output or Genlock Input ○ XLR 3-pin audio input x2 ○ Line/Mic/ +48 V Selectable ○ Earphone • Camera Control Units (CCU): <ul style="list-style-type: none"> ○ Assignable buttons ○ Intercom I/O & control block ○ Camera power indicator ○ Panel lock switch ○ HDMI monitor output ○ Trunk connector (RS-232C) ○ Reference input ○ Prompter input ○ Ethernet port • Accessories <ul style="list-style-type: none"> ○ With Colour LCD View Finder ○ Tripod adaptor • Pedestal for each studio <ul style="list-style-type: none"> ○ Capable of supporting 100kg ○ Steering Ring ○ Maximum height at 160cm ○ Total Weight – 150kg 	4
2	<p>Teleprompter for each studio Camera</p> <ul style="list-style-type: none"> • Auto Tele Prompter Software Complete with Q Box with BNC, SDI and VGA Output • Foot Control for Wincue Multi-button Hand Control • MSP 17" on Camera Unit Complete with Hood, Glass, Bracket, Cables & fixing Plate • USB Hand Control With Forward/Reverse and Marker Buttens • Computer (PC) with PCIE or PCIX slots • 21" LCD Computer Monitor 	4
3	<p>ON AIR SERVER SYSTEM (with active redundancy) 1 + 1</p> <p>MULTI FORMATS DV25 MPEG2/4 + AUTOMATION</p> <ul style="list-style-type: none"> • 4GB RAM • HDD-2TB • 20" TFT Monitor • SDI- I/O , Composite I/O Cards 	6

	<ul style="list-style-type: none"> • KVM Extenders • CG application as part of the payout Annual Software Maintenance and standard technical Support	
4	Networked NEWS Edit Stations <ul style="list-style-type: none"> • RAM 4GB or better • HDD- 2 TB • 20" TFT Monitor • SDI- I/O , Composite I/O Cards • Tape Drives / DVD for external back up • Adobe Premiere Pro Editing Software 	4
5	Networked NEWS Edit Stations <ul style="list-style-type: none"> • RAM 4GB or better • HDD- 2 TB • 20" TFT • Tape Drives / DVD for external back up • SDI- I/O , Composite I/O Cards • Final Cut Editing Application 	4
6	VIDEO ARCHIVING <ul style="list-style-type: none"> • Networked Attached Storage capacity 100TB • LTO Video Archiving Recorder for 5 yrs storage 	2
7	NETWORKED EDIT STATIONS Video Editing Software (Adobe Premier Pro) Workstation <ul style="list-style-type: none"> • 4GB RAM • 20" TFT Monitor • HDD: 4TB • Quad Core Processor, • DVD Super Multi Drive • IEEE 1394 PCI Card • SDI- I/O , Composite I/O Cards • Stereo powered speakers PC I Interface Card with SDI I/O and Composite video I/O	15
8	NETWORKED EDIT STATIONS <ul style="list-style-type: none"> • 4GB RAM • 20" TFT Monitor • HDD: 4TB • Quad Core Processor, • DVD Super Multi Drive • IEEE 1394 PCI Card • Final Cut Video Editing Application • Stereo powered speakers PC I Interface Card with SDI I/O and Composite video I/O	10
9	SCHEDULING MACHINE 20" Dual Display, Quad Core Processor, 4GB RAM, 4 TB- HDD	6
10	PROFESSIONAL CG SYSTEM <ul style="list-style-type: none"> • Advanced Character Generation • Windows-Based System • Supports Multiple Resolutions & Formats • 24-Bit Color 	4

	<ul style="list-style-type: none"> • Animation capable • Character Attributes & Style Galleries • Multiple Typefaces • Digital Time Display • Logo Customization • Title Composer • Display List Editor • Banner Crawl 	
11	WIRELESS STUDIO MICROPHONES SYSTEM COMPLETE WITH TX/RX AND ACCESSORIES <ul style="list-style-type: none"> • RF Output -50Mw • S/N > 100dB • Carrier range- 470 to 870MHZ • Maximum Deviation 75khz • Distortion < 0.3% • Phase reversible • Rechargeable batteries • Long battery life approx.. 6 hrs 	100
12	STUDIO MICROPHONES (Condenser) <ul style="list-style-type: none"> • RF Output -50Mw • S/N > 100dB • Carrier range- 470 to 870MHZ • Maximum Deviation 75khz • Distortion < 0.3% • Phase reversible • Rechargeable batteries • Long battery life approx.. 6 hrs 	100
13	STUDIO MICROPHONES (Dynamic) <ul style="list-style-type: none"> • RF Output -50Mw • S/N > 100dB • Carrier range- 470 to 870MHZ • Maximum Deviation 75khz • Distortion < 0.3% • Phase reversible • Rechargeable batteries • Long battery life approx.. 6 hrs 	100
14	Tapeless Video Cameras: ENG <ul style="list-style-type: none"> • HD/SD capable • Video out: BNC,HD-SDI/SD-SDI/HD-SDI/SD-SDI: 0.8 Vp-p, 75Ω • Composite: 1.0 Vp-p, 75Ω • Monitor out: BNC x 1, HD-SDI/HD-Y switchable, HD-SDI: 0.8Vp-p, 75Ω, HD-Y: 1.0Vp-p, 75Ω • Signal Format : Selectable from 1080i/50, 720p/50 • Utilises at least two(2) 32 GB Flash memory card • Capable of recording at least 120mins • 6-pin x 1, IEEE 1394 standard digital Interface • XLR Interfaces • Complete kit of camera accessories including tripods, Hard carrier case, Four Channel Charger, Tripod adaptor 	15

15	Video Cameras <ul style="list-style-type: none"> • HD/SD capable • Video out: BNC,HD-SDI/SD-SDI/HD-SDI/SD-SDI: 0.8 Vp-p, 75Ω • Composite: 1.0 Vp-p, 75Ω • Monitor out: BNC x 1, HD-SDI/HD-Y switchable, HD-SDI: 0.8Vp-p, 75Ω, HD-Y: 1.0Vp-p, 75Ω • Signal Format : Selectable from 1080i/50, 720p/50 • Utilises at least two(2) 32 GB Flash memory card • Capable of recording at least 120mins • 6-pin x 1, IEEE 1394 standard digital Interface • XLR Interfaces • Complete kit of camera accessories including tripods, Hard carrier case, Four Channel Charger, Tripod adaptor 	10
16	ON-AIR RECORDING SERVERS <ul style="list-style-type: none"> • SDI I/O • Composite Output • 24x 7 x 365 storage x 3 years • Tape Drives (TO) 	2
17	INGEST SERVERS <ul style="list-style-type: none"> • 20'' Dual Display, • Quad Core Processor, • 4GB RAM, • 4 TB- HDD • SDI I/O • Composite I/O 	5
Switcher System		
18	2 M/E HD Switcher,Includes: 2 M/E Compact Control Panel & GUI. 6U Mainframe. Consists of 40 inputs, 4 Keyers per M/E, 8 outputs and 8 Aux outputs, 8 Source Aux outputs. 3D DVE, Chroma Key, Resize Engines, Key Border, Still & Clip Store, Programmable Output, External Control, GPI/GPO's, Safe Area Generator and Mainframe and Control Panel redundant PSUs.	2
19	Virtual Studio features : <ul style="list-style-type: none"> • Channels : 32 • 8 Simultaneous inputs • Video Input : <ul style="list-style-type: none"> ○ HD-SDI, HD Component, SD-SDI, SD Component, Y/C (BNC) or Composite ○ HD-SDI video conforms to SMPTE 292M and SD video conforms to SMPTE 259M and ITU-R BT.656 • Video Output : <ul style="list-style-type: none"> ○ HD-SDI, HD Component, SD-SDI, SD Component, Y/C (BNC), or Composite ○ HDMI, DVI and VGA output for monitors and/or projector ○ Output sources include Program and AUX (configurable for Program, Program clean, Preview, any input, Effects, any frame store, alpha out) 	2

	<ul style="list-style-type: none"> • Recording : <ul style="list-style-type: none"> ○ Full HD recording of Program or AUX output in all resolutions up to 1080p ○ Multiformat Capable : MPEG 2, MPEG4-H.264 ,AVI, MP3 ○ Adjustable audio headroom ○ ISO recording of any live input or output with IsoCorder™ ○ Multi-track, multi-format video recording capability ○ Native HD/SD up to 8 simultaneous channels in all resolutions ○ Source per channel: Program output, AUX output or camera inputs • M/E-Bus- Style Virtual Inputs: <ul style="list-style-type: none"> ○ 8 independent mix/effect-style channels, each with presets, dedicated upstream overlay channel with transition control, and independent source effects; positioning, scaling, cropping and 3D rotation • Live Streaming <ul style="list-style-type: none"> ○ HD/SD live streaming in resolutions up to 720p (16:9 aspect ratio), with simultaneous archive ○ Streaming Profile Manager with integrated Web browser to manage or view streams, and access online CDN accounts • Analog Inputs: <ul style="list-style-type: none"> ○ 8 SDI Embedded ○ 8 AES3/EBU ○ 8 x 2 Balanced XLR (Mic/Line) ○ Analog audio levels conform to SMPTE RP-155 ○ Phantom Power Support • Analog Output : <ul style="list-style-type: none"> ○ Seven-band equalizer and full stereo compressor/limiter per output • Video Processing : <ul style="list-style-type: none"> ○ 4:4:4:4 ○ 32-bit Floating Point • Audio Processing : <ul style="list-style-type: none"> ○ 4 channels, 96 kHz ○ 32-bit Floating Point • Supported Formats: <ul style="list-style-type: none"> ○ PAL 1080/25p, 1080/50i, 720/50p, 720/25p, 576/25i ○ NTSC/SECAM: 1080/30p, 1080/24p, 1080/60i, 720/60p, 720/30p, 720/24p, 480/60i • Recording durations: 200hrs or better for 1080i • Transition effects: <ul style="list-style-type: none"> ○ Animated transitions with full-color, embedded overlay, audio and alpha channel on all 11 effects channels • Virtual Sets : <ul style="list-style-type: none"> ○ live virtual sets with multiple camera angles, animated zoom, real-time reflections and specular highlights not less than 24 	
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	<p>sets for HD</p> <ul style="list-style-type: none"> • Playback Media Formats: <ul style="list-style-type: none"> ○ Movie files: AVI, DV, DVCPro, DVCProHD, FLV, F4V, H.263, H.264, MOV, MKV, MJPEG, MPEG (1, 2 in all profiles, program or transport streams), MP4, WMV, WebM and more ○ Image files: PSD, PNG, TGA, BMP, JPEG, EXR, RAW, TIF and more ○ Audio files: AIFF, MP3, WAV and more • Import media application for batch copying with optional transcoding of files (including Apple Pro Res) • Exported Media Format : <ul style="list-style-type: none"> ○ Export media applications for batch copying with optional transcoding of files to compatible formats for different applications and devices ○ Media types: AVI, DV, DVCPro, DVD, H.264, MOV, MPEG-2, MJPEG, MP4, WebM and more ○ Presets for external NLEs: Adobe Premiere®, Avid® Media Composer®, Apple® Final Cut Pro®, and more ○ Presets for all mobile platforms: Android®, iPad®, iPhone®, iPod Touch® and more • Multiview: <ul style="list-style-type: none"> ○ Configurable for All Monitors, External Monitors, Internal Monitors • Video Ingest: <ul style="list-style-type: none"> ○ eSATA • Monitor Output <ul style="list-style-type: none"> ○ Program, Preview, Effects, Preview/Program and Waveform/Vectorscope • Tally : <ul style="list-style-type: none"> ○ DB 15 connector for 8 PGM row tally lights • Power Supply: <ul style="list-style-type: none"> ○ Provision for redundant and removable PS required 	
20	6 input Analogue to SDI converter boards	10
32x 32 HD/SD Video Router		
21	32x32 SDI Routing Switcher, w/ external power supply	2
22	Redundant Power Supply	2
23	Remote Control Panel	2
24	Programmable Contact Closure Interface, 1RU, 32 inputs/outputs	2
Video Server		
25	<p>Digital Video Server 40 TB</p> <ul style="list-style-type: none"> • 4GB RAM • 20" TFT Monitor • HDD: 4TB 	2

	<ul style="list-style-type: none"> • Quad Core Processor, • DVD Super Multi Drive • IEEE 1394 PCI Card • Final Cut Video Editing Application • Stereo powered speakers PC I Interface Card with SDI I/O and Composite video I/O	
Test Signal Generator		
26	<ul style="list-style-type: none"> • 8 video test patterns • 1 & 10KHz audio tones • 0dBu & +4dBu levels • Video & S-video outs • 2 x balanced audio out • Text book accurate • Battery powered 	2
PROFESSIONAL SPG System		
27	VIDEO GENERATOR MAINFRAME	2
28	CHANGEOVER UNIT	2
Waveform System		
29	Waveform / Vector / Sub- Carrier to Horizontal (SCH) Monitor-4 Inputs with Picture Display	5
Monitor System		
30	4.3" 800x480 Multi-Format Quad LCD Rack Mount. HD/SD SDI and Composite inputs with loop-Thru. 2RU x 19" rack. Embedded audio metering. Waveform/vectorscope	8
31	4.8" 800x480 Multi-Format Triple LCD Rack Mount. HD/SD SDI and Composite inputs with loop-Thru. 2RU x 19" rack. Embedded audio metering. Waveform/vectorscope	8
32	17" Multi-Format LCD Monitor HD/SD, Audio Disembeder, Internal speaker, DVI, HDMI input/output	15
33	24" Multi-Format LCD Monitor HD/SD, Audio Disembeder, Internal speaker, DVI input:	10
34	42" LCD Monitor , DVI input	15
Multiviewer		
35	Quad multiviewer + frame, DVI and HDSDI outputs. Autosensing HD (1080i/720p), SDI (625/525), Composite (PAL/), Embedded audio monitoring. GPI inputs. Features : Autosensing HDSDI, SDI, Composite, Embedded audio monitoring. GPI inputs. Fifth loop input for cascading, Ethernet, and accessories for auto sensing input , UMD/Tally and alarms	8
36	Optional second power supply for dual redundancy	4
TALLY/UMD System		
37	TallyMan ® extended UMD control system (2RU)	

38	Under Monitor Display. Dynamic 8 Characters.	4
39	Programmable source controller	
Peripheral Device		
40	Analog Video Distribution Amplifier, with 10 I/O rear connector	4
41	Single 1x8 distribution amplifier, SD/ASI non-reclocking, 2 slots	4
42	Single 1x4 distribution amplifier, non-reclocking,SD/ASI, 1 slots	4
43	Single 1x8 distribution amplifier, ASI/SD non-reclocking, 2 slots	4
44	AES Digital Audio Multiplexer, 4 channel, balanced, with double-slot rear connector	4
45	SD to Analog Video 12-bit Digital Encoder with line sync, with double-slot rear connector, with features for customizable alarms	4
46	SD-SDI A/V frame sync and processing amplifier, HD & 3D ready , includes double-slot backmodule and breakout cable	4
47	1RU Up/Down/Cross Converter & Synchronizer, Video and 16 Channel Audio, Local Control Panel, Redundant Power Supply (Dual Channel .27/1.5 Gb/s Conversion)	4
Video Tape Recorder		
	VTR :	
48	<p>HD/SD-SDI Output</p> <p>The HD/SD-SDI output that allows straight duplication to a deck with HD/SD-SDI input.</p> <p>Multi-format Playback/Recording Capability</p> <ul style="list-style-type: none">• supports HDV native progressive recording modes and has a 60i/50i switchable function, so it can playback/record:•HDV1080i: 60i/50i/24p/30p/25p•DVCAM/DV:60i/50i•The HDV720p(24/25/30p) tape playback is available for a simple viewing.* <p>Standard and Mini Size Cassette Tape Compatibility</p> <p>Supports both standard and mini size cassette tapes and accepts standard cassettes shot from other VTRs</p> <p>2.7-inch Wide Clear Photo LCD plus Screen and Monaural Speaker</p> <p>A built-in 2.7-inch type wide Clear Photo LCD plus screen and built-in monaural speaker to allow quick and convenient checking of video and audio.</p> <ul style="list-style-type: none">• Be able to convert material from HD down to SD, and output the SD video signal through its i.LINK, SD-SDI, analogue component, S-video, and composite connectors.• Should be able to down-convert signals from the aspect ratio of 16:9 to 4:3. Display modes can be selected from Squeeze, Letterbox, and Edge Crop*16.	10
SD Character Generator		
49	<p>PROFESSIONAL CG SYSTEM</p> <ul style="list-style-type: none">• Advanced Character Generation	5

	<ul style="list-style-type: none">• Windows-Based System• Supports Multiple Resolutions & Formats• 24-Bit Color• Animation capable• Character Attributes & Style Galleries• Multiple Typefaces• Digital Time Display• Logo Customization• Title Composer• Display List Editor• Banner Crawl	
Clock System		
50	GPS Clock System Driver Unit, with GPS receiver and antenna(Master)	2
51	GPS Clock System Driver Unit, with GPS receiver and antenna(Slave)	2
52	High stability quartz crystal oscillator Clock System Driver Unit	2
53	Timecode distribution,EBU,1x12	2
54	LED Digital Clock,2RU	2
55	Clocks: to be placed in all studios.	30
• InterCom System to Link all 10 x Provincial Centres Control Rooms and TV Operational Areas.		
56	Intercom Matrix Frame. Frame with user menu and RJ-45 programmable panel/4-wire ports and 4 4-wire in/ out ports. Has Dual-redundant PSUs.	1
57	V-Series 2RU 24 Lever Key Display Panel with XLR-4 Male headset connector	
58	V-Series 1RU 12 Lever Key Display Panel with XLR-4 Male headset connector.	
59	Standard Length Mic - Gooseneck (340mm or 12 inches). for use V-Series panels	
Audio System		
Digital Mixing System		
60	Main Digital Mixing Console,Comprehensive interface with 24 touch-sensitive 100-mm motor faders.Generous mixing capacity with up to 32 simultaneous inputs and 22 mix buses : Integrated Telephone Hybrid System	2
61	Peak Meter Bridge	2
62	Digital I/O Card for Digital Mixers,16 AES I/O In One Card	2
63	Digital I/O Card for Digital Mixers,8 Analog Ins + 8 Analog Outs In One Card	2
Digital Mixing System (Backup)		
64	Backup Digital Mixing Console, Comprehensive interface with 16 touch-sensitive 100-mm motor faders. Generous mixing capacity with up to 40 simultaneous inputs and 20 mix buses (20 buses: a main stereo program bus, 8 individual mixing	2

	buses, 2 solo buses, and 8 auxiliary buses) in a compact rack-size mixer.	
65	Expansion cards for use in the option I/O slots of the digital mixers and mixing engines: Digital I/O Card for Digital Mixers, 16 AES I/O In One Card	2
Player and Recorder		
66	<p>CD Player:</p> <p>Support disk- CD-DA, CD-ROM ISO9660 Level 1/2/ROMEO/JOLIET</p> <p>Single loader</p> <p>Digital Output :</p> <p>AES-3id- BNC</p> <p>AES3-2003/AES-3id-2001</p> <p>Analog Output :</p> <p>RCA</p> <p>Output impedance – 200 Ohms</p> <p>Line Output : XLR-3-32(1:GND,2:HOT,3:COLD</p> <p>CF : FAT32/16 @ 4GB</p> <p>Audio performance :</p> <p>Frequency Response- 20Hz-20kHz, ±0.5dB</p> <p>S/N Ratio- Greater than 100dB (20kHz LPF, a-weighted)</p> <p>Less than 0.005% (+22dBu, 1kHz, 20kHz LPF)</p> <p>Phones : 6.3mm 1/4-inch stereo phone jack</p> <p>Power Consumption: 18w</p>	6
67	<p>CD Recorder :</p> <ul style="list-style-type: none"> • High-quality stereo recording at up 192kHz/24-bit or DSD format • Records to Built-in 60GB hard drive, DVD+RW, CD-R/RW media • Archives to DVD-R, DVD-RW, DVD+R and DVD+RW discs • Multiband compression and 3-band EQ mixdown effects • USB 2.0 connection to PC for use as DVD data drive • Balanced XLR and unbalanced RCA inputs and outputs • Balanced AES/EBU inputs and outputs, running at normal, double-speed and double-wire formats • SDIF-3 DSD input and output for external conversion and processing of DSD audio • Word Sync In, Out, Thru • RS-232C serial control • PS/2 keyboard connector for title editing 	6
68	<p>Professional Broadcast Digital Telephone Hybrid Type A</p> <p>Transmit : All measurements referenced at –15dBm level on the phone line.</p> <p>FREQUENCY RESPONSE: +/- 1dB from 250Hz to 3.5 kHz</p> <p>DYNAMIC RANGE: >70dB</p> <p>DISTORTION: <0.15%</p> <p>Receive : All measurements referenced at –15 dBm level on the</p>	2

	<p>phone line with caller processing options bypassed.</p> <p>FREQUENCY RESPONSE: +/- 1dB from 250Hz to 3.5kHz</p> <p>DYNAMIC RANGE: >70dB</p> <p>DISTORTION: <0.1%</p> <p>19” Rack Mounted</p> <p>AES/EBU IN: XLR</p> <p>pin 1= ground, pin 2= +phase, pin 3= -phase; 32, 44.1, or 48kHz sample rate</p> <p>AES/EBU OUT: XLR</p> <p>pin 1=ground, pin 2=+phase, pin 3= -phase; 32, 44.1, or 48kHz sample rate</p> <p>Power : Auto Adjusting, 100-240VAC,</p>																					
69	<p>Professional Broadcast Analogue Telephone Hybrid Type B</p> <table><tr><td>Input Impedance – Line Mode (Clean Feed)</td><td>10kΩ balanced 0dB</td></tr><tr><td>Input Impedance-Microphone Mode</td><td>200Ω balanced</td></tr><tr><td>Clean Feed Limiting Input</td><td>+4dBu</td></tr><tr><td>Microphone Level Range by preset pots</td><td>74Db to 40Db adjusted</td></tr><tr><td>Bandwidth to telephone line ref 1kHz</td><td>250Hz - 4kHz, -3dB</td></tr><tr><td>Telephone Line Impedance:</td><td>Nominally 600Ω</td></tr><tr><td>Telephone Line Impedance Range:</td><td>300Ω to 1500Ω</td></tr><tr><td>Output Impedance: 0dBu</td><td>50Ω balanced floating</td></tr><tr><td>Output Level Range: adjusted by preset pot</td><td>+8dB to -14dB</td></tr><tr><td>Rejection Ratio:</td><td>45dB on 1kHz tone, typically 28dB on complex waveforms, reference peak level of 0dB</td></tr></table> <p>Mic/Line Input: XLR 3 pin female with push button mic/line selection</p> <p>Line Output: XLR 3 pin male</p> <p>Telephone Line: RJ11 6/4 socket</p> <p>Telephone Handset/Instrument: RJ11 6/4 socket</p> <p>19” Rack Mounted</p> <p>Power : Auto Adjusting, 100-240VAC</p>	Input Impedance – Line Mode (Clean Feed)	10kΩ balanced 0dB	Input Impedance-Microphone Mode	200Ω balanced	Clean Feed Limiting Input	+4dBu	Microphone Level Range by preset pots	74Db to 40Db adjusted	Bandwidth to telephone line ref 1kHz	250Hz - 4kHz, -3dB	Telephone Line Impedance:	Nominally 600Ω	Telephone Line Impedance Range:	300Ω to 1500Ω	Output Impedance: 0dBu	50Ω balanced floating	Output Level Range: adjusted by preset pot	+8dB to -14dB	Rejection Ratio:	45dB on 1kHz tone, typically 28dB on complex waveforms, reference peak level of 0dB	2
Input Impedance – Line Mode (Clean Feed)	10kΩ balanced 0dB																					
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Rejection Ratio:	45dB on 1kHz tone, typically 28dB on complex waveforms, reference peak level of 0dB																					
InterCom System																						
70	<p>Intercom Matrix Frame.</p> <ul style="list-style-type: none">• Frame with user menu and RJ-45 programmable panel/4-wire ports and 4 4-wire in/ out ports with Dual-redundant PSUs.• 19” rack mount Central Processor• Rack mount Ethernet based Communication Controllers to interface to the local control racks• Surge protection and lightning protection is required• Digital Voice Recording System located within an equipment rack	1																				

	<ul style="list-style-type: none"> Alarm calls capability shall be incorporated Tamper calls : initiated when an attempt is made to gain unauthorized access to intercom station electronics Data Integrity: In times of power failure, the actual status information in the system at the time of the failure shall not be lost. When the power is reconnected, all status information at the time of the power failure shall be retrievable. The System shall be capable of automatically detecting excessive Audio Levels, The system is expected to link all the studio facilities with provision for expansion to other areas of operations 	
Other Equipment for system		
71	Broadcast Loudness Meter	5
72	D21-Master Sync Generator	5
73	Volume Controller	5
74	On-Line Broadcast Delay	6
75	Stereo Reverb/Effects Processor	5
76	AES/EBU digital audio distribution amplifier (1:4)	5
77	Analog audio distribution amplifier(mono 1:8)	5
78	Frame capable of housing any mix of signal types, including 3G\HD\SD-SDI, DVB-ASI, single- and multimode fiber optics, AES/EBU (balanced and unbalanced), analog video and analog audio. with fan,includes one 6822+AC power supply and Ethernet resource card	5
79	DI Box	10
80	16 XLR female to 16 BNC female	
81	16 XLR male to 16 BNC female	
82	8 channels, pre-selection from 1 of 2 groups of 16 analogue inputs, independent selection of 1 of 4 mono-sources to left and right output. 8 analog inputs by "Phoenix" connectors, XLR output of selected channels. 4 x 53 segment high-resolution level meters showing simultaneous PPM over VU. Push button channel selection and summing of analog channels.	13
83	1RU, Self-Powered Speaker System, 2 HD/SD-SDI Auto-Sensing Inputs on BNC, 1 Re-Clocked HD/SD-SDI Output on BNC, Front Panel Selection of any 2 of 4 SDI Groups for monitoring and conversion, Unbalanced AES/EBU Outputs on HD-15 de-embedded from any 2 selected groups of HD/SD-SDI, 4 unbalanced AES/EBU Inputs on BNC, 8 Balanced Analog Inputs on DB-25, 8 Balanced Analog Outputs of Metered Audio, 2 Analog Outputs of selected channels on XLRs, 8 x 26-Segment, High-Resolution Level Meters showing multaneous PPM over VU, LCD display of system status and Phase Correlation.	13
Monitor Equipment		
84	Two-way Active Nearfield Monitor	10
85	Compact active studio monitor	10
86	Active subwoofer	10

87	Headphone	30
Microphone		
88	Short gun interference tube microphone, with Microphone wind muff, Pistol Grip, Blimp windscreen.	30
89	Electret condenser lavalier microphones	20
90	Omni-Directional Handheld Dynamic ENG Microphone with Extended Handle	20
Closed Circuit Television		
91	<p>The solution should provide for complete surveillance of the broadcast station</p> <p>Features:</p> <ul style="list-style-type: none"> • 20 x Optical Zoom • Extremely low light capture • Megapixel resolution (1600 x 1200) to capture small details and better identify subjects • Quad streaming MPEG4/JPEG video • Up to 30 frames per second • Pan range of -175° to +175° • Tilt range of +90° to -23° • 4X digital zoom • Auto Pan • Auto Patrol • Preset • The recording software should allow for viewing and recording up to sixteen cameras. • Two-way audio • Micro SD card slot for local recording for 1 week • 0.2 lux minimum illumination <p>Storage : Capable of storing images for 3 months after which the info is achieved.</p>	2
Console and Racks		
92	Giant display wall 4 x 42" Display 5mm seam gaps between screens	2
93	Standard Video Console	2
94	Standard Audio Console	2
95	Equipment Racks based on the equipment to be supplied	
MEDIA CONVERSION		
96	<p>Integrated Multimedia Data Management System</p> <ul style="list-style-type: none"> • :Umatic Machines, x 6 • Betacam Machines for Conversions x 6 • Digital Catalogue Computing System, 	1

	<ul style="list-style-type: none"> • Disk Array for Data Storage to store 6000hours of archive material, • Indexing Server System for the 6000hrs 	
	System Integration	
97	For the audiovisual system	
OUTSIDE BROADCASTING VANS		
98	<ul style="list-style-type: none"> • State of the Art Outside Broadcast Technology • 8 Camera Chain • 3 x Slow Motion Equipment System • 32 x 32 Vision Mixer • 32 x 32 Audio Mixer • In built Power conditioning • Air-conditioned • 2 x Microwave links • 12 m x 3m x 4m (Lx WxH) Studio structure • DVD R/W 	1
CONSTRUCTION OF NEW STUDIO		
99	<ul style="list-style-type: none"> • Construction of New Studio 200m² (3 Camera Chain) 	1
100	<ul style="list-style-type: none"> • upgrade existing studio in Copperbelt: 1x150m² 	1
GENERATOR SET		
101	<ul style="list-style-type: none"> • Kitwe - 500kVA 	2

LIVINGSTONE

This specification is to replicated for nine locations

Item	Specification	Quantity
	LIVINGSTONE STUDIO CENTRE REQUIREMENTS	
1	3x CAMERA CHAIN <ul style="list-style-type: none"> • HD/SD capable camera system <ul style="list-style-type: none"> ○ SDI Output ○ HD/SD-SDI Input ○ Signal Format : Selectable from 1080i/50, 720p/50 ○ Prompter output or Genlock Input ○ XLR 3-pin audio input x2 ○ Line/Mic/ +48 V Selectable ○ Earphone • Camera Control Units (CCU): <ul style="list-style-type: none"> ○ Assignable buttons ○ Intercom I/O & control block ○ Camera power indicator ○ Panel lock switch ○ HDMI monitor output ○ Trunk connector (RS-232C) ○ Reference input ○ Prompter input ○ Ethernet port • Accessories <ul style="list-style-type: none"> ○ With Colour LCD View Finder ○ Tripod adaptor • Pedestal for each studio <ul style="list-style-type: none"> ○ Capable of supporting 100kg ○ Steering Ring ○ Maximum height at 160cm ○ Total Weight – 150kg 	1
2	Teleprompters: <ul style="list-style-type: none"> • Auto Tele Prompter Software Complete with Q Box with BNC, SDI and VGA Output • Foot Control for Wincue Multi-button Hand Control • MSP 17" on Camera Unit Complete with Hood, Glass, Bracket, Cables & fixing Plate • USB Hand Control With Forward/Reverse and Marker Buttens • Computer (PC) with PCIE or PCIX slots • 21" LCD Computer Monitor 	3
3	Multipurpose Frame Synchroniser: HD/SD dedicated system	2
4	Master Automated Playout Server: Multiformat Features: <ul style="list-style-type: none"> • 4GB RAM • HDD-2TB • 19" TFT Monitor 	1

	<ul style="list-style-type: none"> • KVM Extenders • CG application as part of the playout Annual Software Maintenance and standard technical Support	
5	Active Slave Automated Playout Server(Multiformat) Features: <ul style="list-style-type: none"> • 4GB RAM • HDD-2TB • 19" TFT Monitor • KVM Extenders • CG application as part of the playout Annual Software Maintenance and standard technical Support	1
6	Networked NEWS Edit Stations <ul style="list-style-type: none"> • RAM 4GB or better • HDD- 2 TB • Tape Drives / DVD for external back up • Adobe Premiere Pro 	2
7	Networked NEWS Edit Stations <ul style="list-style-type: none"> • RAM 4GB or better • HDD- 2 TB • Tape Drives / DVD for external back up • Final Cut 	2
8	VIDEO ARCHIVING <ul style="list-style-type: none"> • Networked Attached Storage capacity 40TB • LTO Video Archiving Recorder for 5 yrs storage 	2
9	ON-AIR LOGGER SERVER <ul style="list-style-type: none"> • 24 X 7 X 6 months • Tape drive repository 	2
10	NETWORKED EDIT STATIONS- ADOBE PREMIERE PRO: Video Editing Software (Adobe Premier Pro) Stereo powered speakers Workstation <ul style="list-style-type: none"> • 4GB RAM • 20inch TFT Monitor • HDD: 4TB • Quad Core Processor, • DVD Super Multi Drive • IEEE 1394 PCI Card PC I Interface Card with SDI I/O and Composite video I/O	3
	NETWORKED EDIT STATIONS- FINAL CUT Video Editing Software (Adobe Premier Pro) Stereo powered speakers Workstation <ul style="list-style-type: none"> • 4GB RAM • 20inch TFT Monitor • HDD: 4TB • Quad Core Processor, • DVD Super Multi Drive • IEEE 1394 PCI Card PC I Interface Card with SDI I/O and Composite video I/O	2

11	SCHEDULING(PLAYLIST CREATOR) MACHINE 20'' TFT Display, Quad Core Processor, 4GB RAM, 4 TB- HDD	1
12	PROFESSIONAL CG SYSTEM <ul style="list-style-type: none"> Advanced Character Generation Windows-Based System Supports Multiple Resolutions & Formats 24-Bit Color Animation capable Character Attributes & Style Galleries Multiple Typefaces Digital Time Display Logo Customization Title Composer Display List Editor Banner Crawl 	2
13	WIRELESS STUDIO MICROPHONES SYSTEM COMPLETE WITH TX/RX AND ACCESSORIES <ul style="list-style-type: none"> RF Output -50Mw S/N > 100dB Carrier range- 470 to 870MHZ Maximum Deviation 75khz Distortion < 0.3% Phase reversible Rechargeable batteries Long battery life approx.. 6 hrs 	15
14	Field microphones <ul style="list-style-type: none"> Dynamic 	15
15	Studio Microphones <ul style="list-style-type: none"> Dynamic Condenser 	10 10
16	Tapeless Cameras: ENG <ul style="list-style-type: none"> HD/SD capable Video out: BNC,HD-SDI/SD-SDI/HD-SDI/SD-SDI: 0.8 Vp-p, 75Ω Composite: 1.0 Vp-p, 75Ω Monitor out: BNC x 1, HD-SDI/HD-Y switchable, HD-SDI: 0.8Vp-p, 75Ω, HD-Y: 1.0Vp-p, 75Ω Signal Format : Selectable from 1080i/50, 720p/50 Utilises at least two(2) 32 GB Flash memory card Capable of recording at least 120mins 6-pin x 1, IEEE 1394 standard digital Interface XLR Interfaces Complete kit of camera accessories including tripods, Hard carrier case, Four Channel Charger, Tripod adaptor 	6
17	INGEST SERVERS <ul style="list-style-type: none"> 4GB RAM, 4 TB- HDD 20'' Dual Display 	3

18	ON-LINE UPS <ul style="list-style-type: none"> • 5000VA 	3
19	Switcher System 2 M/E HD Switcher, Includes: <ul style="list-style-type: none"> • 2 M/E Compact Control Panel & GUI. 6U Mainframe. Consists of 40 inputs, 4 Keyers per M/E, 8 outputs and 8 Aux outputs, 8 Source Aux outputs. 3D DVE, Chroma Key, Resize Engines, Key Border, Still & Clip Store, Programmable Output, External Control, GPI/GPO's, Safe Area Generator and Mainframe and Control Panel redundant PSUs. 	1
20	Virtual Studio features : <ul style="list-style-type: none"> • Channels : 32 • 8 Simultaneous inputs • Video Input : <ul style="list-style-type: none"> ○ HD-SDI, HD Component, SD-SDI, SD Component, Y/C (BNC) or Composite ○ HD-SDI video conforms to SMPTE 292M and SD video conforms to SMPTE 259M and ITU-R BT.656 • Video Output : <ul style="list-style-type: none"> ○ HD-SDI, HD Component, SD-SDI, SD Component, Y/C (BNC), or Composite ○ HDMI, DVI and VGA output for monitors and/or projector ○ Output sources include Program and AUX (configurable for Program, Program clean, Preview, any input, Effects, any frame store, alpha out) • Recording : <ul style="list-style-type: none"> ○ Full HD recording of Program or AUX output in all resolutions up to 1080p ○ Multiformat Capable : MPEG 2, MPEG4-H.264 ,AVI, MP3 ○ Adjustable audio headroom ○ ISO recording of any live input or output with IsoCorder™ ○ Multi-track, multi-format video recording capability ○ Native HD/SD up to 8 simultaneous channels in all resolutions ○ Source per channel: Program output, AUX output or camera inputs • M/E-Bus- Style Virtual Inputs: <ul style="list-style-type: none"> ○ 8 independent mix/effect-style channels, each with presets, dedicated upstream overlay channel with transition control, and independent source effects; positioning, scaling, cropping and 3D rotation • Live Streaming <ul style="list-style-type: none"> ○ HD/SD live streaming in resolutions up to 720p (16:9, 4:3 aspect ratio), with simultaneous archive ○ Streaming Profile Manager with integrated Web browser to manage or view streams, and access online CDN accounts • Analog Inputs: <ul style="list-style-type: none"> ○ 8 SDI Embedded ○ 8 AES3/EBU ○ 8 x 2 Balanced XLR (Mic/Line) 	1

	<ul style="list-style-type: none"> ○ Analog audio levels conform to SMPTE RP-155 ○ Phantom Power Support ● Analog Output : <ul style="list-style-type: none"> ○ Seven-band equalizer and full stereo compressor/limiter per output ● Video Processing : <ul style="list-style-type: none"> ○ 4:4:4:4 ○ 32-bit Floating Point ● Audio Processing : <ul style="list-style-type: none"> ○ 4 channels, 96 kHz ○ 32-bit Floating Point ● Supported Formats: <ul style="list-style-type: none"> ○ PAL 1080/25p, 1080/50i, 720/50p, 720/25p, 576/25i ○ NTSC/SECAM: 1080/30p, 1080/24p, 1080/60i, 720/60p, 720/30p, 720/24p, 480/60i ● Recording durations: 200hrs or better for 1080i ● Transition effects: <ul style="list-style-type: none"> ○ Animated transitions with full-color, embedded overlay, audio and alpha channel on all 11 effects channels ● Virtual Sets : <ul style="list-style-type: none"> ○ live virtual sets with multiple camera angles, animated zoom, real-time reflections and specular highlights not less than 24 sets for HD ● Playback Media Formats: <ul style="list-style-type: none"> ○ Movie files: AVI, DV, DVCPro, DVCProHD, FLV, F4V, H.263, H.264, MOV, MKV, MJPEG, MPEG (1, 2 in all profiles, program or transport streams), MP4, WMV, WebM and more ○ Image files: PSD, PNG, TGA, BMP, JPEG, EXR, RAW, TIF and more ○ Audio files: AIFF, MP3, WAV and more ● Import media application for batch copying with optional transcoding of files (including Apple Pro Res) ● Exported Media Format : <ul style="list-style-type: none"> ○ Export media applications for batch copying with optional transcoding of files to compatible formats for different applications and devices ○ Media types: AVI, DV, DVCPro, DVD, H.264, MOV, MPEG-2, MJPEG, MP4, WebM and more ○ Presets for external NLEs: Adobe Premiere®, Avid® Media Composer®, Apple® Final Cut Pro®, and more ○ Presets for all mobile platforms: Android®, iPad®, iPhone®, iPod Touch® and more ● Multiview: <ul style="list-style-type: none"> ○ Configurable for All Monitors, External Monitors, Internal 	
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	<p>Monitors</p> <ul style="list-style-type: none"> • Video Ingest: <ul style="list-style-type: none"> ○ eSATA • Monitor Output <ul style="list-style-type: none"> ○ Program, Preview, Effects, Preview/Program and Waveform/Vectorscope • Tally : <ul style="list-style-type: none"> ○ DB 15 connector for 8 PGM row tally lights • Power Supply: <p>Provision for redundant and removable PS required</p>	
21	<p>CODECs</p> <ul style="list-style-type: none"> • SDI to ASI • ASI to Optical • Optical to ASI • Composite to SDI • SDI to Composite 	10
32x 32 HD/SD Video Router		
22	32x32 SDI Routing Switcher, w/ external power supply	1
23	Redundant Power Supply	1
24	Remote Control Panel	1
25	Programmable Contact Closure Interface, 1RU, 32 inputs/outputs	1
Video Hard disk Server		
26	Digital Video Hard disk Server 40 TB	13
SPG System		
27	VIDEO GENERATOR MAINFRAME	13
28	CHANGEOVER UNIT	13
Waveform System		
29	Waveform / Vector / SCH Monitor-4 Inputs with Picture Display	4
Monitor System		
30	4.3" 800x480 Multi-Format Quad LCD Rack Mount. HD/SD SDI and Composite inputs with loop-Thru. 2RU x 19" rack. Embedded audio metering. Waveform/vectorscope	2
31	4.8" 800x480 Multi-Format Triple LCD Rack Mount. HD/SD SDI and Composite inputs with loop-Thru. 2RU x 19" rack. Embedded audio metering. Waveform/vectorscope	4
32	17" Multi-Format LCD Monitor HD/SD : (VXP), Audio Disembeder, Internal speaker, HDMI input, For technical	3
33	17" Multi-Format LCD Monitor HD/SD, Audio Disembeder, Internal speaker, DVI input	10

34	24" Multi-Format LCD Monitor HD/SD, Audio Disembeder, Internal speaker, DVI input	2
35	42" LCD Monitor , DVI input	4
Multiviewer		
36	42" Quad multiviewer + frame, DVI and HD/SD-SDI outputs. Autosensing HD (1080i/720p), SDI (625/525), Composite (PAL), Embedded audio monitoring. GPI inputs. Features: Autosensing HDSDI, SDI, Composite, Embedded audio monitoring. GPI inputs. Fifth loop input for cascading. ZConfigurator standard, Ethernet	2
37	2RU 12 autosensing input multiviewer supporting HDSDI, SDSDI and composite inputs. Embedded audio, UMD/Tally and alarms as standard.	1
38	Optional second power supply for dual redundancy	1
TALLY/UMD System		
39	TallyMan ® extended UMD control system (2RU)	1
40	Under Monitor Display. Dynamic 8 Characters.	1
41	Programmable source controller	1
Peripheral Device		
42	Analog Video Distribution Amplifier, with 10 I/O rear connector	4
43	Single 1x8 distribution amplifier, SD/ASI non-reclocking, 2 slots	4
44	Single 1x4 distribution amplifier, non-reclocking,SD/ASI, 1 slots	4
45	Single 1x8 distribution amplifier, ASI/SD non-reclocking, 2 slots	4
46	AES Digital Audio Multiplexer, 4 channel, balanced, with double-slot rear connector	4
47	SD to Analog Video 12-bit Digital Encoder with line sync, with double-slot rear connector, QSEE-compliant	4
48	SD-SDI A/V frame synch and processing amplifier, HD & 3G ready , includes double-slot backmodule and breakout cable	4
49	IRU Up/Down/Cross Converter & Synchronizer, Video and 16 Channel Audio, Local Control Panel, Redundant Power Supply (Dual Channel .27/1.5 Gb/s Conversion)	4
Video Tape Recorder		
	VTR :	
50	HD/SD-SDI Output The HD/SD-SDI output that allows straight duplication to a deck with HD/SD-SDI input. Multi-format Playback/Recording Capability <ul style="list-style-type: none"> supports HDV native progressive recording modes and has a 60i/50i switchable function, so it can playback/record: 	5

	<ul style="list-style-type: none"> •HDV1080i: 60i/50i/24p/30p/25p •DVCAM/DV:60i/50i •The HDV720p(24/25/30p) tape playback is available for a simple viewing.* <p>Standard and Mini Size Cassette Tape Compatibility Supports both standard and mini size cassette tapes and accepts standard cassettes shot from other VTRs shoulder-mount DVCAM camcorders.</p> <p>2.7-inch Wide Clear Photo LCD plus Screen and Monaural Speaker A built-in 2.7-inch type wide Clear Photo LCD plus screen and built-in monaural speaker allow quick and convenient checking of video and audio.</p> <ul style="list-style-type: none"> • Be able to convert material from HD down to SD, and output the SD video signal through its i.LINK, SD-SDI, analogue component, S-video, and composite connectors. • Should be able to down-convert signals from the aspect ratio of 16:9 to 4:3. Display modes can be selected from Squeeze, Letterbox, and Edge Crop*16. 	
Clock System		
51	GPS Clock System Driver Unit, with GPS receiver and antenna(Master)	1
52	GPS Clock System Driver Unit, with GPS receiver and antenna(Slave)	1
53	High stability quartz crystal oscillator Clock System Driver Unit	1
54	Timecode distribution,EBU	2
55	LED Digital Clock,2RU	4
InterCom System		
56	<p>Intercom Matrix Frame.</p> <ul style="list-style-type: none"> • Frame with user menu and RJ-45 programmable panel/4-wire ports and 4 4-wire in/ out ports with Dual-redundant PSUs. • 19" rack mount Central Processor • Rack mount Ethernet based Communication Controllers to interface to the local control racks • Surge protection and lightning protection is required • Digital Voice Recording System located within an equipment rack • Alarm calls capability shall be incorporated • Tamper calls : initiated when an attempt is made to gain unauthorized access to intercom station electronics • Data Integrity: In times of power failure, the actual status information in the system at the time of the failure shall not be lost. When the power is reconnected, all status information at the time of the power failure shall be retrievable. • The System shall be capable of automatically detecting excessive Audio Levels, • The system is expected to link all the studio facilities. 	1
Audio System		
Digital Mixing System		
57	Main Digital Mixing Console,Comprehensive interface with 24 touch-sensitive 100-mm motor faders.Generous mixing capacity with up to 32 simultaneous inputs and 22 mix buses	1
58		

59	Peak Meter Bridge	1
60	Digital I/O Card for Digital Mixers,16 AES I/O In One Card	2
61	Digital I/O Card for Digital Mixers,8 Analog Ins + 8 Analog Outs In One Card	2
Digital Mixing System (Backup)		
62	Backup Digital Mixing Console,Comprehensive interface with 16 touch-sensitive 100-mm motor faders.Generous mixing capacity with up to 40 simultaneous inputs and 20 mix buses (20 buses: a main stereo program bus, 8 individual mixing buses, 2 solo buses, and 8 auxiliary buses) in a compact rack-size mixer.	1
63	Mini-YGDAI Digital I/O Card for Digital Mixers,16 AES I/O In One Card	1
Audio Player		
64	<p>CD Player:</p> <p>Support disk- CD-DA,CD-ROM ISO9660 Level1/2/ROMEO/JOLIET</p> <p>Single loader</p> <p>Digital Output :</p> <p>AES-3id- BNC</p> <p>AES3-2003/AES-3id-2001</p> <p>Analog Output :</p> <p>RCA</p> <p>Output impedance – 200 Ohms</p> <p>Line Output : XLR-3-32(1:GND,2:HOT,3:COLD</p> <p>CF : FAT32/16 @ 4GB</p> <p>Audio performance :</p> <p>Frequency Response- 20Hz-20kHz,±0.5dB</p> <p>S/N Ratio- Greater than 100dB (20kHz LPF,a-weighted)</p> <p>Less than 0.005% (+22dBu,1kHz,20kHz LPF)</p> <p>Phones : 6.3mm 1/4-inch stereo phone jack</p> <p>Power Consumption: 18w</p>	3
65	<p>CD Recorder :</p> <ul style="list-style-type: none"> • High-quality stereo recording at up 192kHz/24-bit or DSD format • Records to Built-in 60GB hard drive, DVD+RW, CD-R/RW media • Archives to DVD-R, DVD-RW, DVD+R and DVD+RW discs • Multiband compression and 3-band EQ mixdown effects • USB 2.0 connection to PC for use as DVD data drive • Balanced XLR and unbalanced RCA inputs and outputs • Balanced AES/EBU inputs and outputs, running at normal, double-speed and double-wire formats • SDIF-3 DSD input and output for external conversion and processing of DSD audio • Word Sync In, Out, Thru 	3

	<ul style="list-style-type: none"> • RS-232C serial control • PS/2 keyboard connector for title editing 	
Closed Circuit Television		
66	<p>The solution should provide for complete surveillance of the broadcast station</p> <p>Features:</p> <ul style="list-style-type: none"> • 20 x Optical Zoom • Extremely low light capture • Megapixel resolution (1600 x 1200) to capture small details and better identify subjects • Quad streaming MPEG4/JPEG video • Up to 30 frames per second • Pan range of -175° to +175° • Tilt range of +90° to -23° • 4X digital zoom • Auto Pan • Auto Patrol restricted • Preset 20 positions • The recording software should allow for viewing and recording up to sixteen cameras. • Two-way audio • Micro SD card slot for local recording for 1 week • 0.2 lux minimum illumination <p>Storage :</p> <ul style="list-style-type: none"> • Capable of storing images for 3 months after which the info is achieved. 	
67	<p>ACCESS CONTROL:</p> <ul style="list-style-type: none"> • Using card and Thumb • Accessed by Programmable ID cards • Should have battery backup power 	1
Other Equipment for system		
68	Broadcast Loudness Meter	2
69	Master Sync Generator	2
70	Volume Controller	2
71	On-Line Broadcast Delay	5
72	Stereo Reverb/Effects Processor	5
73	AES/EBU digital audio distribution amplifier (1:4)	5
74	Analog audio distribution amplifier(mono 1:8)	5
75	Ethernet resource card in 2RU Frame with fan	2
76	AC power supply for Ethernet Resource Card	2
77	DI Box	5
78	16 XLR female to 16 BNC female	

79	16 XLR male to 16 BNC female	
80	8 channels, pre-selection from 1 of 2 groups of 16 analog inputs, independent selection of 1 of 4 mono-sources to left and right output. 8 analog inputs by "Phoenix" connectors, XLR output of selected channels. 4 x 53 segment high-resolution level meters showing simultaneous PPM over VU. Push button channel selection and summing of analog channels.	1
81	1RU, Self-Powered Speaker System, 2 HD/SD-SDI Auto-Sensing Inputs on BNC, 1 Re-Clocked HD/SD-SDI Output on BNC, Front Panel Selection of any 2 of 4 SDI Groups for monitoring and conversion, Unbalanced AES/EBU Outputs on HD-15 de-embedded from any 2 selected groups of HD/SD-SDI, 4 unbalanced AES/EBU Inputs on BNC, 8 Balanced Analog Inputs on DB-25, 8 Balanced Analog Outputs of Metered Audio, 2 Analog Outputs of selected channels on XLRs, 8 x 26-Segment, High-Resolution Level Meters showing multaneous PPM over VU, LCD display of system status and Phase Correlation.	1
Monitor Equipment		
82	Two-way Active Audio Monitor 100W	2
83	Compact active studio monitor , 30W	2
84	Active subwoofer , 80 W	2
85	Headphones	10
Console and Racks		
86	Giant display wall 4 x 42" Display 5mm seam gaps between screens	1
87	Standard Video Console	1
88	Standard Audio Console	1
89	Equipment Racks	
90	System Integration	
91	For the audiovisual system	
CONSTRUCTION OF NEW STUDIO		
92	<ul style="list-style-type: none"> Construction of New Studio 200m² 	1
AIRCONDITIONING SYSTEM		
93	<ul style="list-style-type: none"> Cooling system for 200 sq meter studio 	1
GENERATOR SET		
94	<ul style="list-style-type: none"> LIVINGSTONE - 200kVA 	

Annex II: Transmitters & Shelter specifications

Table: II.1: TECHNICAL SPECIFICATIONS OF OVERAL TRANSMITTERS

ITEM	PARAMETER	PARAMTER VALUE REQUIRED
1	AC power supply Requirements Power Supply	415V±105 AC 3 Phase 4 wire + ground, 50hz ±2Hz
2	Power Factor	≥0.9
3	Surge arrestor	≥40KA
4	Cooling system	Liquid cooled with Heat Exchanger
5	Safety	EN 60215, EN 60950 with latest Amendments
	System Parameters	
	transmitter Power output (after output BPF)	Up to 7KW RMS (COFDM- DVB-T2)
	Frequency range	Any assigned channnel between 470-690MHz
	Bandwidth	8MHz
	TV standard	DVB-T2, compliant to EN302755
	Output Connector of transmitter	3-1/8" EIA Flange Silver Plated copper
	RF Output Impedance	50Ω Unbalanced with load VSWR 1.1
	Harmonic Level (for all harmonics)	60dB below carrier level or better
	Spurious emissions	60dB below carrier or better
	Modulation	Coded orthogonal Frequency division

		Multiplex (COFDM) having all modes of modulation and parameter options as per EN 302755
	Inter modulation products (Better filter)	$\geq 35\text{db}$ (with Pre-correction) at $\pm 4.2\text{MHz}$
	Crest Factor/PAPR	13db Max
	Equivalent Noise Degradation (END)	1dB Max
	MER at the input of critical mask with 5KW rms DVB-T2 Power at the output of critical mask	\geq
	Switch on time	<5 seconds
	Shoulder Level (Before filter)	$\geq -35\text{dB}$
	Monitoring and control Facility	
	System monitoring	As per spec in the document
	remote operation, control and monitoring of transmitters	As per spec in the document
	Efficiency of transmitter % including cooling system	

SUGGESTIVE BILL OF MATERIALS FOR ONE SITE

ITEM	DESCRIPTION	QUANTITY
1	5 KW RMS (DVB-T2) UHF Dual Drive, Liquid Cooled, Fully Solid State digital TV Transmitter conforming to DVB-T2 standards (EN 302755) Comprising of: a) Dual Exciter System in 1+1 with changeover facility b) Power Amplifier System c) Control system d) Liquid cooling system e) Transmitter Cabinet f) Software for remote operation and monitoring of transmitter parameters through web interface	1 set

	g) Licensed copies of all software(s) used in the transmitter and allied equipment in the form of CD, besides being loaded into the system/PC. h) Extender for Power Amplifiers (PA)	
2	Computer system (comprising of PC, Laser Printer, 600VA UPS) with Pre-loaded software for remote monitoring of the transmitter system	
3	Broadcast power monitor with unflanged 3-1/8" line section	1 set
4	Indoor rigid copper coaxial feeder lines and necessary connectors	1 set
5	Input, Monitoring and Measuring Equipment	1 set
a)	Network adaptor	1 set
b)	Transport Stream monitor (ASI-MPEG 4)	1 set
c)	DUAL Picture TFT monitor with size 7" to 8" screen	
d)	Professional Grade standard 19" Rack	1 set
6	COMPUTER system with pre-loaded licensed software for remote monitoring of transmitter system	1 set
7	Site acceptance test by OEM and Zambian engineers	1 job at each site in zambia
8	Training for Zambian engineers at the factory	1 Lot
9	Training for zambian engineers for a period of one week at the site	1 lot
10	Documentation for all equipment consisting of 1 Lot installation, maintenance, and operation manuals, test data etc	1 lot
11	Any other item required for completeness of the system	1 Lot
12	40 KVA on-line back up UPS with Isolation transformer comprising of battery Bank, Battery rack, Interconnecting cables, Operation and maintenance manual, input Isolation transformer	1 No.
13	Complete RF system comprising of: a) 6x4 Vertical polarised antenna panels b) Splitter cables c) 3-1/8" un-flanged coaxial feeder cable d) 2 - way modular combiner e) Dehydrator and f) necessary connectors and accessories	
14	150 No. Set Top Boxes as one lot	set
15	Drawings showing details of the equipment layout	
16	Spare Items Essential spares comprising of: 1. transmitter components and modules 2. Test jig for Power Amplifier 3. The hardware and software necessary for the system	1 set

TECHNICAL SPECIFICATIONS OF EXCITER

ITEM	PARAMETER	VALUE OF PARAMETER REQUIRED
1	Inputs ASI- Input	Two No.s DVB-ASI, (MPEG-4TS) 2x BNC Female, 75Ω according to EN 50083-9 Input BNC, 50Ω
2	Reference signal frequencies	10MHz
3	Bit rate adaptor/MIP Inserter for SFN	Should be available in the system as per DVB-T2 standard (EN 302755)
4	External Timing Refernce	1PPS Input BNC, 50Ω
	Level range	TTL-Level
5	RF Output connector	BNC/N, 50Ω
6	Frequency range	470 to 862 MHz
7	Channel bandwidth	8MHz
8	frequency Synthesizer	in 1 steps or better
9	Monitoring Outputs	
	RF Output	BNC/N, 50Ω
10	Incident/Reflected signal (RF output)	BNC/N, 50Ω
	1 PPS Signal (1Hz)	Suitable connector
	MPEG 2TS	TTL (BNC)
	Mega Frame Sync. (TTL)	Suitable connector at suitable Place
	Reference frequency 10MHz	Suitable connector
	Remote control via SNMP/Ethernet connection	SNMP Interface/ web Browser/RJ45 (All Driver software CDs/DVDs should be provided)

11	Coding and modulation	COFDM EN302755 QPSK, 16QAM,64QAM, 256 QAM CODE Rates: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6 guard Internal: 1/4, 19/256, 1/8, 19/128, 1/16, 1/32, 1/128 Modes: 1K, 2K, 4K, 8K, 16K, 32k Note: Coding and modulation should meet the EN302755 Fully
12	Pre-correction	Adaptive (Auto) pre- correction should be included

NETWORK ADAPTOR**Specifications**

10 DVB ASI interfaces (in and / or out)

100kb/s to 213Mb/s per interface Gigabit Ethernet/port more

Interfaces	<ul style="list-style-type: none"> •2 Independent Gigabit Ethernet Ports, electrical or optical (SFP) •10/100/1000 Base-T auto-sensing •Half and full Duplex
MPEG Services Over IP	<ul style="list-style-type: none"> •Pro MPEG Forum Code of Practice #3 rev2 compliant •RTP/UDP and UDP, 1 to 7 MPEG packets per IP datagram •Row, 1D/2D column forward error correction (FEC) •Advanced clock recovery to minimize the effects of IPDV jitter,

	Up to 200ms. •Traffic policing and shaping •Inserv/DiffDerv ToS byte field Tagging for Qos support •VLAN tagging 802.1p, 802.1q •Unicast and multicast (IGMP V2 and V3) •IP routing: static, RIP, OSPF •Up to 213 Mb/s per IP stream
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**Technical Specifications:
For ASI Interface**

1.0 INPUT		
ITEM	PARAMETER	SPECIFICATION
A	ASI Input	Connector BNC
B	Number of Inputs	Minimum one
C	ASI Bit Rate	80Mbps,±100ppm
D	Data Format	Must accept both burst and packet mode of ASI format
E	Packet length	188,204 byte
F	Signal Amplitude	250mV p-p minimum
G	Termination	75 ohm
H	Return Loss	>17dB
2.0 OUTPUT		
A	Connector	BNC, Female
B	ASI bit rate	same as the Input
C	Data Format	same as the Input
D	Signal Amplitude	700mV p-p minimum
E	Output Impedance	75 ohm
F	Return Loss	>17dB

For COFDM Interface:

ITEM	PARAMETER	SPECIFICATION
1	Input Frequency range	50MHz to 860MHz
2	Channel Bandwidth	7,8MHz
3	Connector	1x F/SMA Type with or without BNC adaptor
4	Input Return Loss	7 dB typical
5	Input Level	(-90 to -30dbm, +/-1db)
6	Shoulders	(-45 dB max
7	Error Vector Magnitude	1% to 39% rms for QPSK 1% to 20% rms for 16 QAM 1% to 8.5% rms for 64 QAM 0.7% to 1.2% rms for 256 QAM
8	Modulation Error Ratio	6 db to 37 dB for QPSK (4QAM) 11 dB to 37 dB for 16 QAM 16 dB to 37 dB for 64 QAM 21 dB to 37 dB for 256QAM resolution 0.1 dB, Accuracy ± 1 dB

DUMMY LOAD**Technical Specifications**

ITEM	DESCRIPTION	TECHNICAL SPECIFICATIONS
1	Power Rating	6 or 10KW rms, DTT (DVB-T2) Power as per site specifications
2	connector	3-1/8" EIA Un-Flanged
3	Frequency Range	470 to 862MHz
4	VSWR	$\leq 1.05:1$
5	PAPR	>13dB
6	Impedance (Nominal)	50 Ohm Nominal
7	Load Coolant	Forced Air Cooled
8	AC Power	Single Phase, 220Volts(rms) $\pm 10\%$, 50Hz $\pm 4\%$
9	Temperature of Storage	(-10 °C to 60° C)
10	Temperature of Operation	5° to

		45° C
11	Humidity	95% NC at 40°C

DEHYDRATOR**Technical Specifications**

ITEM	DESCRIPTION	TECHNICAL SPECIFICATIONS
1	Power Supply	220/240V AC 50Hz
2	Dry Air Output	Free Air delivery 3 litres per min.(6.3 cubic feet)
3	Output Pressure	15psi
4	wet dry Bypass	Fail safe solenoid valve controlled by humidity
5	Display & Alarms	Output Pressure (Digital Read out0) Compressor Total Running hours counter Output Pressure (LED) Low Output Pressure Alarm

COMBINER**Technical Specifications**

ITEM	DESCRIPTION	TECHNICAL SPECIFICATIONS
1	Type	4 Way Modular (i.e. Expandable to take up to 6 transmitters)
2	Configurations	CIB
3	Frequency Range	470 - 862 MHz
4	NB Max. Input Power	5KW rms
5	Maximum Output	20KW, rms
6	Channel Bandwidth	8MHz
7	Impedance	50 Ohms
8	VSWR	≤1.1
9	Insertion Loss	≥0.3dB
10	Isolation NB-WB WB-NB	≥36dB ≥45dB
11	Minimum Channel Spacing	1
12	Standard	3-1/8" With Flange Connectors as

	Connection	necessary
13	Material	None Corrosive

Item	Specification	Quantity
LUSAKA STUDIO CENTRE REQUIREMENTS		
1	<p>4x CAMERA CHAIN</p> <ul style="list-style-type: none"> • HD/SD capable camera system <ul style="list-style-type: none"> ○ SDI Output ○ HD/SD-SDI Input ○ Signal Format : Selectable from 1080i/50, 720p/50 ○ Prompter output or Genlock Input ○ XLR 3-pin audio input x2 ○ Line/Mic/ +48 V Selectable ○ Earphone • Camera Control Units (CCU): <ul style="list-style-type: none"> ○ Assignable buttons ○ Intercom I/O & control block ○ Camera power indicator ○ Panel lock switch ○ HDMI monitor output ○ Trunk connector (RS-232C) ○ Reference input ○ Prompter input ○ Ethernet port • Accessories <ul style="list-style-type: none"> ○ With Colour LCD View Finder ○ Tripod adaptor • Pedestal for each studio <ul style="list-style-type: none"> ○ Capable of supporting 100kg ○ Steering Ring ○ Maximum height at 160cm ○ Total Weight – 150kg 	4
2	<p>2 x CAMERA CHAIN</p> <ul style="list-style-type: none"> • HD/SD capable camera system <ul style="list-style-type: none"> ○ SDI Output ○ HD/SD-SDI Input ○ Signal Format : Selectable from 1080i/50, 720p/50 ○ Prompter output or Genlock Input ○ XLR 3-pin audio input x2 ○ Line/Mic/ +48 V Selectable ○ Earphone • Camera Control Units (CCU): <ul style="list-style-type: none"> ○ Assignable buttons ○ Intercom I/O & control block ○ Camera power indicator ○ Panel lock switch ○ HDMI monitor output ○ Trunk connector (RS-232C) ○ Reference input ○ Prompter input ○ Ethernet port • Accessories <ul style="list-style-type: none"> ○ With Colour LCD View Finder 	1

	<ul style="list-style-type: none"> ○ Tripod adaptor • Pedestal for each studio <ul style="list-style-type: none"> ○ Capable of supporting 100kg ○ Steering Ring ○ Maximum height at 160cm ○ Total Weight – 150kg 	
WIRELESS SD CAMERA LINK		
3	<ul style="list-style-type: none"> • Transmitter System <ul style="list-style-type: none"> ○ HD/SD Camera Transmitter : SD-SDI, ASI ○ Modulation : COFDM ○ Bandwidth : 5,6,7 & 8 MHZ ○ Input Formats: PAL, SDI ○ Frequency Band- 2GHz ○ Bandwidth – 400MHZ ○ Maximum Output Power- 100Mw • Omnidirectional Linear Flexi <ul style="list-style-type: none"> ○ Gain: 3dBi ○ Bandwidth – 700MHZ • Receiver System <ul style="list-style-type: none"> ○ Demodulation: COFDM ○ Bandwidth: 5,6,7,8 MHZ • Down Converter Mini <ul style="list-style-type: none"> ○ Frequency range : 2.0 to 22.7GHZ ○ Noise Figure < 1.5Db ○ Conversion Gain > 25Db • Sector Antenna 2GHZ, <ul style="list-style-type: none"> ○ Frequency band : 2GHZ ○ Bandwidth – 500MHZ ○ Gain: 13dBi ○ Radiation pattern : 90 H – 20 V • Active IF Distributor <ul style="list-style-type: none"> ○ Frequency Range: 50MHZ to 1GHZ ○ Number of Outputs – 4 ○ Level of Outputs: Same as input level • Intercom Base Station <ul style="list-style-type: none"> ○ Digital • Intercom Mobile Radio 	1

	<ul style="list-style-type: none"> ○ UHF Mobile radio • Omni UHF Intercom Base Station <ul style="list-style-type: none"> ○ Bandwidth- 50MHZ ○ Gain: 2dBi 	
PORTABLE DATA TERMINAL(COMPLETE SYSTEM – TX & RX)		
4	<p>Features :</p> <ul style="list-style-type: none"> • X, Ka and Ku bands • 60cm reflector • Fully integrated man portable design • Interchangeable modem options • 5Mbps data rate • Graphical interface control <p>X-Band Specification</p> <ul style="list-style-type: none"> ○ Tx Frequency Band.....7.9-8.4 GHz ○ Rx Frequency.....7.25-7.75 GHz ○ EIRP (sat) @ 8.15GHz.....45.3 dBW ○ G/T @ 7.5GHz.....10.1 dB/K ○ Polarisation..... ○ Tx – RHCP or LHCP configurable ○ Rx – Orthogonal to Tx ○ Axial Ratio.....<2dB (Tx), <1.21dB (Rx) ○ Tx Spurious (Carrier Related)..... <-60dBc ○ Tx Spurious (Non Carrier Related)..... ○ <-60dBm ○ Intermodulation Products.....<-25dBc ○ SSPA Power.....25W ○ Sidelobes.....MIL-STD-188-164A <p>Ka-Band Specification</p> <ul style="list-style-type: none"> ○ Tx Frequency Band.....30-31 GHz (Option 29.5 – 31GHz) ○ Rx Frequency Band.....20.2-21.2 GHz (Option 18.7GHz – 20.2GHz) ○ EIRP (sat) @ 30.5GHz.....55.3dBW ○ G/T @ 20.7GHz.....17.7dB/K ○ Polarisation..... ○ Tx – RHCP or LHCP configurable ○ Rx – Orthogonal to Tx ○ Linear (Option) ○ Axial Ratio.....<1.0dB (Tx), 1.5dB (Rx)dB ○ Tx Spurious (Carrier Related)..... <-60dBc ○ Tx Spurious (Non Carrier Related)..... <p><-70dBc</p> <ul style="list-style-type: none"> ○ Intermodulation Products.....<-25dBc ○ SSPA Power.....16W ○ Radiation Pattern Compliance..... ETSI EN 301.358 MIL-STD-188-164A ITU-R S.465.5 and S.580-6 FCC 25.209 <p>Ku-Band Specification</p> <ul style="list-style-type: none"> ○ Tx Frequency Band.....13.75 – 14.5 GHz ○ Rx Frequency Bands.....10.95 – 11.70 GHz 11.70 – 12.20 GHz 12.25 – 12.75 GHz ○ EIRP (sat) @ 14.125GHz.....50.2dBW ○ G/T @ 11.7GHz.....14.1dB/K 	10

	<ul style="list-style-type: none"> ○ Polarisation.....Linear H/V ○ Tx orthogonal to Rx ○ Axial ratio..... ○ <20 (29dB cross polar isolation) ○ Tx Spurious (Carrier Related)..... ○ <-60dBc ○ Tx Spurious (Non Carrier Related)..... ○ <-70dBc ○ Intermodulation Products.....<-25dBc ○ SSPA Power.....20W 	
5	190CM PORTABLE DATA TERMINAL(Complete System)	
	Features <ul style="list-style-type: none"> • C-Band <ul style="list-style-type: none"> ○ Transmit Frequency : 5.85GHZ ○ Receive Frequency : 3.4GHZ ○ Gain:39.15dBi@5.85GHZ ○ Linear Polarisation 1 tx port, 1 rx port / Circular-LH/RH CP ; Tx port LH, rx port RH ○ Power(W) CW: 650 • Ku-Band <ul style="list-style-type: none"> ○ Transmit Frequency: 13.75 GHZ ○ Receive Frequency : 10.7GHZ ○ Gain: 46.3 dBi ○ Polarisation : Linear Orthogonal/ Circular ○ Feed: 1 tx port, 1 rx port • Azimuth <ul style="list-style-type: none"> ○ $\pm 90^\circ$ with segment case fixed to mount case ○ $\pm 90^\circ$ with mount case sited independently of the segment case • Elevation <ul style="list-style-type: none"> ○ 0 to 90° to 0 • Polarisation : $\pm 95^\circ$ 	1
6	Teleprompter for each studio Camera <ul style="list-style-type: none"> • Auto Tele Prompter Software Complete with Q Box with BNC, SDI and VGA Output • Foot Control for Wincue Multi-button Hand Control • MSP 17" on Camera Unit Complete with Hood, Glass, Bracket, Cables & fixing Plate • USB Hand Control With Forward/Reverse and Marker Buttens • Computer (PC) with PCIE or PCIX slots 21" LCD Computer Monitor	10

7	ON AIR SERVER SYSTEM (with active redundancy) 1 + 1 MULTI FORMATS DV25 MPEG2/4 + AUTOMATION <ul style="list-style-type: none"> • 4GB RAM • HDD-2TB • 20" TFT Monitor • SDI- I/O , Composite I/O Cards • KVM Extenders • CG application as part of the playout Annual Software Maintenance and standard technical Support	12
8	Networked NEWS Edit Stations <ul style="list-style-type: none"> • RAM 4GB or better • HDD- 2 TB • SDI- I/O , Composite I/O Cards • Tape Drives / DVD for external back up • Adobe Premiere Pro Editing Software 	8
9	Networked NEWS Edit Stations <ul style="list-style-type: none"> • RAM 4GB or better • HDD- 2 TB • Tape Drives / DVD for external back up • SDI- I/O , Composite I/O Cards • Final Cut Editing Application 	8
10	VIDEO ARCHIVING <ul style="list-style-type: none"> • Networked Attached Storage capacity 100TB • LTO Video Archiving Recorder for 5 yrs storage 	2
11	NETWORKED EDIT STATIONS Video Editing Software (Adobe Premier Pro) Workstation <ul style="list-style-type: none"> • 4GB RAM • 20inch TFT Monitor • HDD: 4TB • Quad Core Processor, • DVD Super Multi Drive • IEEE 1394 PCI Card • SDI- I/O , Composite I/O Cards • Stereo powered speakers PC I Interface Card with SDI I/O and Composite video I/O	30
12	NETWORKED EDIT STATIONS <ul style="list-style-type: none"> • 4GB RAM • 20" TFT Monitor • HDD: 4TB • Quad Core Processor, • DVD Super Multi Drive • IEEE 1394 PCI Card • Final Cut Video Editing Application • Stereo powered speakers PC I Interface Card with SDI I/O and Composite video I/O	12
13	SCHEDULING MACHINE 20" Dual Display, Quad Core Processor, 4GB RAM, 4 TB- HDD	8

14	PROFESSIONAL CG SYSTEM <ul style="list-style-type: none"> • Advanced Character Generation • Windows-Based System • Supports Multiple Resolutions & Formats • 24-Bit Color • Animation capable • Character Attributes & Style Galleries • Multiple Typefaces • Digital Time Display • Logo Customization • Title Composer • Display List Editor • Banner Crawl 	8
15	WIRELESS STUDIO MICROPHONES SYSTEM COMPLETE WITH TX/RX AND ACCESSORIES <ul style="list-style-type: none"> • RF Output -50Mw • S/N > 100dB • Carrier range- 470 to 870MHZ • Maximum Deviation 75khz • Distortion < 0.3% • Phase reversible • Rechargeable batteries • Long battery life approx.. 6 hrs 	180
16	STUDIO MICROPHONES (Condenser) <ul style="list-style-type: none"> • RF Output -50Mw • S/N > 100dB • Carrier range- 470 to 870MHZ • Maximum Deviation 75khz • Distortion < 0.3% • Phase reversible • Rechargeable batteries • Long battery life approx.. 6 hrs 	180
17	STUDIO MICROPHONES (Dynamic) <ul style="list-style-type: none"> • RF Output -50Mw • S/N > 100dB • Carrier range- 470 to 870MHZ • Maximum Deviation 75khz • Distortion < 0.3% • Phase reversible • Rechargeable batteries • Long battery life approx.. 6 hrs 	180
18	Tapeless Video Cameras: ENG <ul style="list-style-type: none"> • HD/SD capable • Video out: BNC,HD-SDI/SD-SDI/HD-SDI/SD-SDI: 0.8 Vp-p, 75Ω • Composite: 1.0 Vp-p, 75Ω • Monitor out: BNC x 1, HD-SDI/HD-Y switchable, HD-SDI: 0.8Vp-p, 75Ω, HD-Y: 1.0Vp-p, 75Ω • Signal Format : Selectable from 1080i/50, 720p/50 • Utilises at least two(2) 32 GB Flash memory card 	60

	<ul style="list-style-type: none"> Capable of recording at least 120mins 6-pin x 1, IEEE 1394 standard digital Interface XLR Interfaces Complete kit of camera accessories including tripods, Hard carrier case, Four Channel Charger, Tripod adaptor 	
19	Video Cameras <ul style="list-style-type: none"> HD/SD capable Video out: BNC,HD-SDI/SD-SDI/HD-SDI/SD-SDI: 0.8 Vp-p, 75Ω Composite: 1.0 Vp-p, 75Ω Monitor out: BNC x 1, HD-SDI/HD-Y switchable, HD-SDI: 0.8Vp-p, 75Ω, HD-Y: 1.0Vp-p, 75Ω Signal Format : Selectable from 1080i/50, 720p/50 Utilises at least two(2) 32 GB Flash memory card Capable of recording at least 120mins 6-pin x 1, IEEE 1394 standard digital Interface XLR Interfaces Complete kit of camera accessories including tripods, Hard carrier case, Four Channel Charger, Tripod adaptor 	60
20	ON-AIR RECORDING SERVERS <ul style="list-style-type: none"> SDI I/O Composite Output 24x 7 x 365 storage x 3 years Tape Drives (TO) 	8
21	INGEST SERVERS <ul style="list-style-type: none"> 20" Dual Display, Quad Core Processor, 4GB RAM, 4 TB- HDD SDI I/O Composite I/O 	12
Switcher System		
22	2 M/E HD Switcher,Includes: 2 M/E Compact Control Panel & GUI. 6U Mainframe. Consists of 40 inputs, 4 Keyers per M/E, 8 outputs and 8 Aux outputs, 8 Source Aux outputs. 3D DVE, Chroma Key, Resize Engines, Key Border, Still & Clip Store, Programmable Output, External Control, GPI/GPO's, Safe Area Generator and Mainframe and Control Panel redundant PSUs.	13
23	Virtual Studio features : <ul style="list-style-type: none"> Channels : 32 8 Simultaneous inputs Video Input : <ul style="list-style-type: none"> HD-SDI, HD Component, SD-SDI, SD Component, Y/C (BNC) or Composite HD-SDI video conforms to SMPTE 292M and SD video conforms to SMPTE 259M and ITU-R BT.656 Video Output : 	4

	<ul style="list-style-type: none"> ○ HD-SDI, HD Component, SD-SDI, SD Component, Y/C (BNC), or Composite ○ HDMI, DVI and VGA output for monitors and/or projector ○ Output sources include Program and AUX (configurable for Program, Program clean, Preview, any input, Effects, any frame store, alpha out) ● Recording : <ul style="list-style-type: none"> ○ Full HD recording of Program or AUX output in all resolutions up to 1080p ○ Multiformat Capable : MPEG 2, MPEG4-H.264 ,AVI, MP3 ○ Adjustable audio headroom ○ ISO recording of any live input or output with IsoCorder™ ○ Multi-track, multi-format video recording capability ○ Native HD/SD up to 8 simultaneous channels in all resolutions ○ Source per channel: Program output, AUX output or camera inputs ● M/E-Bus- Style Virtual Inputs: <ul style="list-style-type: none"> ○ 8 independent mix/effect-style channels, each with presets, dedicated upstream overlay channel with transition control, and independent source effects; positioning, scaling, cropping and 3D rotation ● Live Streaming <ul style="list-style-type: none"> ○ HD/SD live streaming in resolutions up to 720p (16:9 aspect ratio), with simultaneous archive ○ Streaming Profile Manager with integrated Web browser to manage or view streams, and access online CDN accounts ● Analog Inputs: <ul style="list-style-type: none"> ○ 8 SDI Embedded ○ 8 AES3/EBU ○ 8 x 2 Balanced XLR (Mic/Line) ○ Analog audio levels conform to SMPTE RP-155 ○ Phantom Power Support ● Analog Output : <ul style="list-style-type: none"> ○ Seven-band equalizer and full stereo compressor/limiter per output ● Video Processing : <ul style="list-style-type: none"> ○ 4:4:4:4 ○ 32-bit Floating Point ● Audio Processing : <ul style="list-style-type: none"> ○ 4 channels, 96 kHz ○ 32-bit Floating Point ● Supported Formats: <ul style="list-style-type: none"> ○ PAL 1080/25p, 1080/50i, 720/50p, 720/25p, 576/25i ○ NTSC/SECAM: 1080/30p, 1080/24p, 1080/60i, 720/60p, 720/30p, 720/24p, 480/60i ● Recording durations: 200hrs or better for 1080i ● Transition effects: <ul style="list-style-type: none"> ○ Animated transitions with full-color, embedded overlay, audio 	
--	--	--

	<p>and alpha channel on all 11 effects channels</p> <ul style="list-style-type: none"> • Virtual Sets : <ul style="list-style-type: none"> ○ live virtual sets with multiple camera angles, animated zoom, real-time reflections and specular highlights not less than 24 sets for HD • Playback Media Formats: <ul style="list-style-type: none"> ○ Movie files: AVI, DV, DVCPro, DVCProHD, FLV, F4V, H.263, H.264, MOV, MKV, MJPEG, MPEG (1, 2 in all profiles, program or transport streams), MP4, WMV, WebM and more ○ Image files: PSD, PNG, TGA, BMP, JPEG, EXR, RAW, TIF and more ○ Audio files: AIFF, MP3, WAV and more • Import media application for batch copying with optional transcoding of files (including Apple Pro Res) • Exported Media Format : <ul style="list-style-type: none"> ○ Export media applications for batch copying with optional transcoding of files to compatible formats for different applications and devices ○ Media types: AVI, DV, DVCPro, DVD, H.264, MOV, MPEG-2, MJPEG, MP4, WebM and more ○ Presets for external NLEs: Adobe Premiere®, Avid® Media Composer®, Apple® Final Cut Pro®, and more ○ Presets for all mobile platforms: Android®, iPad®, iPhone®, iPod Touch® and more • Multiview: <ul style="list-style-type: none"> ○ Configurable for All Monitors, External Monitors, Internal Monitors • Video Ingest: <ul style="list-style-type: none"> ○ eSATA • Monitor Output <ul style="list-style-type: none"> ○ Program, Preview, Effects, Preview/Program and Waveform/Vectorscope • Tally : <ul style="list-style-type: none"> ○ DB 15 connector for 8 PGM row tally lights • Power Supply: <ul style="list-style-type: none"> ○ Provision for redundant and removable PS required 	
25	6 input Analogue to SDI converter boards	10
32x 32 HD/SD Video Router		
26	32x32 SDI Routing Switcher, w/ external power supply	4
27	Redundant Power Supply	4
28	Remote Control Panel	4
29	Programmable Contact Closure Interface, 1RU, 32 inputs/outputs	4

Video Server		
30	Digital Video Server 40 TB <ul style="list-style-type: none"> • 4GB RAM • 20" TFT Monitor • HDD: 4TB • Quad Core Processor, • DVD Super Multi Drive • IEEE 1394 PCI Card • Final Cut Video Editing Application • Stereo powered speakers PC I Interface Card with SDI I/O and Composite video I/O	4
Test Signal Generator		
31	<ul style="list-style-type: none"> • 8 video test patterns • 1 & 10KHz audio tones • 0dBu & +4dBu levels • Video & S-video outs • 2 x balanced audio out • Text book accurate • Battery powered 	8
PROFESSIONAL SPG System		
32	VIDEO GENERATOR MAINFRAME	4
33	CHANGEOVER UNIT	4
Waveform System		
34	Waveform / Vector / Sub- Carrier to Horizontal (SCH) Monitor-4 Inputs with Picture Display	10
Monitor System		
Monitor		
35	4.3" 800x480 Multi-Format Quad LCD Rack Mount. HD/SD SDI and Composite inputs with loop-Thru. 2RU x 19" rack. Embedded audio metering. Waveform/vectorscope	12
36	4.8" 800x480 Multi-Format Triple LCD Rack Mount. HD/SD SDI and Composite inputs with loop-Thru. 2RU x 19" rack. Embedded audio metering. Waveform/vectorscope	12
37	17" Multi-Format LCD Monitor HD/SD, Audio Disembeder, Internal speaker, DVI, HDMI input/output	30
38	24" Multi-Format LCD Monitor HD/SD, Audio Disembeder, Internal speaker, DVI input:	20
39	42" LCD Monitor , DVI input	30
Multiviewer		

40	Quad multiviewer + frame, DVI and HDSDI outputs. Autosensing HD (1080i/720p), SDI (625/525), Composite (PAL/), Embedded audio monitoring. GPI inputs. Features : Autosensing HDSDI, SDI, Composite, Embedded audio monitoring. GPI inputs. Fifth loop input for cascading, Ethernet, and accessories for auto sensing input , UMD/Tally and alarms	24
41	Optional second power supply for dual redundancy	10
TALLY/UMD System		
42	TallyMan ® extended UMD control system (2RU)	8
43	Under Monitor Display. Dynamic 8 Characters.	
44	Programmable source controller	
Peripheral Device		
45	Analog Video Distribution Amplifier, with 10 I/O rear connector	8
46	Single 1x8 distribution amplifier, SD/ASI non-reclocking, 2 slots	8
47	Single 1x4 distribution amplifier, non-reclocking,SD/ASI, 1 slots	8
48	Single 1x8 distribution amplifier, ASI/SD non-reclocking, 2 slots	8
49	AES Digital Audio Multiplexer, 4 channel, balanced, with double-slot rear connector	8
50	SD to Analog Video 12-bit Digital Encoder with line sync, with double-slot rear connector, with features for customizable alarms	8
51	SD-SDI A/V frame sync and processing amplifier, HD & 3D ready , includes double-slot backmodule and breakout cable	8
52	1RU Up/Down/Cross Converter & Synchronizer, Video and 16 Channel Audio, Local Control Panel, Redundant Power Supply (Dual Channel .27/1.5 Gb/s Conversion)	8
Video Tape Recorder		
53	HDCAM VTR :	50
54	HD/SD-SDI Output The HD/SD-SDI output that allows straight duplication to a deck with HD/SD-SDI input. Multi-format Playback/Recording Capability <ul style="list-style-type: none">• supports HDV native progressive recording modes and has a 60i/50i switchable function, so it can playback/record:•HDV1080i: 60i/50i/24p/30p/25p•DVCAM/DV:60i/50i•The HDV720p(24/25/30p) tape playback is available for a simple viewing.* Standard and Mini Size Cassette Tape Compatibility Supports both standard and mini size cassette tapes and accepts standard cassettes shot from other VTRs 2.7-inch Wide Clear Photo LCD plus Screen and Monaural Speaker A built-in 2.7-inch type wide Clear Photo LCD plus screen and built-in monaural speaker to allow quick and convenient checking of video and	

	audio. <ul style="list-style-type: none">• Be able to convert material from HD down to SD, and output the SD video signal through its i.LINK, SD-SDI, analogue component, S-video, and composite connectors.• Should be able to down-convert signals from the aspect ratio of 16:9 to 4:3. Display modes can be selected from Squeeze, Letterbox, and Edge Crop*16.	
SD Character Generator		
55	PROFESSIONAL CG SYSTEM <ul style="list-style-type: none">• Advanced Character Generation• Windows-Based System• Supports Multiple Resolutions & Formats• 24-Bit Color• Animation capable• Character Attributes & Style Galleries• Multiple Typefaces• Digital Time Display• Logo Customization• Title Composer• Display List Editor• Banner Crawl	28
Clock System		
56	GPS Clock System Driver Unit, with GPS receiver and antenna(Master)	2
57	GPS Clock System Driver Unit, with GPS receiver and antenna(Slave)	2
58	High stability quartz crystal oscillator Clock System Driver Unit	2
59	Timecode distribution,EBU,1x12	2
60	LED Digital Clock,2RU	2
61	Clocks: to be placed in all studios.	120
• InterCom System to Link all 10 x Provincial Centres Control Rooms and TV Operational Areas.		
62	Intercom Matrix Frame. Frame with user menu and RJ-45 programmable panel/4-wire ports and 4 4-wire in/ out ports. Has Dual-redundant PSUs.	1
63	V-Series 2RU 24 Lever Key Display Panel with XLR-4 Male headset connector	
64	V-Series 1RU 12 Lever Key Display Panel with XLR-4 Male headset connector.	
65	Standard Length Mic - Gooseneck (340mm or 12 inches). for use V-Series panels	
Audio System		
Digital Mixing System		

66	Main Digital Mixing Console, Comprehensive interface with 24 touch-sensitive 100-mm motor faders. Generous mixing capacity with up to 32 simultaneous inputs and 22 mix buses	6
67	Peak Meter Bridge	6
68	Digital I/O Card for Digital Mixers, 16 AES I/O In One Card	6
69	Digital I/O Card for Digital Mixers, 8 Analog Ins + 8 Analog Outs In One Card	6
Digital Mixing System (Backup)		
70	Backup Digital Mixing Console, Comprehensive interface with 16 touch-sensitive 100-mm motor faders. Generous mixing capacity with up to 40 simultaneous inputs and 20 mix buses (20 buses: a main stereo program bus, 8 individual mixing buses, 2 solo buses, and 8 auxiliary buses) in a compact rack-size mixer.	6
71	Expansion cards for use in the option I/O slots of the digital mixers and mixing engines: Digital I/O Card for Digital Mixers, 16 AES I/O In One Card	6
Player and Recorder		
72	<p>CD Player:</p> <p>Support disk- CD-DA, CD-ROM ISO9660 Level 1/2/ROMEO/JOLIET</p> <p>Single loader</p> <p>Digital Output :</p> <p>AES-3id- BNC</p> <p>AES3-2003/AES-3id-2001</p> <p>Analog Output :</p> <p>RCA</p> <p>Output impedance – 200 Ohms</p> <p>Line Output : XLR-3-32(1:GND, 2:HOT, 3:COLD)</p> <p>CF : FAT32/16 @ 4GB</p> <p>Audio performance :</p> <p>Frequency Response- 20Hz-20kHz, ±0.5dB</p> <p>S/N Ratio- Greater than 100dB (20kHz LPF, a-weighted)</p> <p>Less than 0.005% (+22dBu, 1kHz, 20kHz LPF)</p> <p>Phones : 6.3mm 1/4-inch stereo phone jack</p> <p>Power Consumption: 18w</p>	12
73	<p>CD Recorder :</p> <ul style="list-style-type: none"> • High-quality stereo recording at up 192kHz/24-bit or DSD format • Records to Built-in 60GB hard drive, DVD+RW, CD-R/RW media • Archives to DVD-R, DVD-RW, DVD+R and DVD+RW discs • Multiband compression and 3-band EQ mixdown effects • USB 2.0 connection to PC for use as DVD data drive • Balanced XLR and unbalanced RCA inputs and outputs • Balanced AES/EBU inputs and outputs, running at normal, double-speed and double-wire formats • SDIF-3 DSD input and output for external conversion and processing of DSD audio 	12

	<ul style="list-style-type: none">• Word Sync In, Out, Thru• RS-232C serial control• PS/2 keyboard connector for title editing																													
74	<p>Professional Broadcast Digital Telephone Hybrid Type A</p> <p>Transmit : All measurements referenced at –15dBm level on the phone line. FREQUENCY RESPONSE: +/- 1dB from 250Hz to 3.5 kHz DYNAMIC RANGE: >70dB DISTORTION: <0.15%</p> <p>Receive : All measurements referenced at –15 dBm level on the phone line with caller processing options bypassed. FREQUENCY RESPONSE: +/- 1dB from 250Hz to 3.5kHz DYNAMIC RANGE: >70dB DISTORTION: <0.1%</p> <p>19” Rack Mounted</p> <p>AES/EBU IN: XLR pin 1= ground, pin 2= +phase, pin 3= -phase; 32, 44.1, or 48kHz sample rate AES/EBU OUT: XLR pin 1=ground, pin 2=+phase, pin 3= -phase; 32, 44.1, or 48kHz sample rate</p> <p>Power : Auto Adjusting, 100-240VAC,</p>	6																												
75	<p>Professional Broadcast Analogue Telephone Hybrid Type B</p> <table><tr><td>Input Impedance – Line Mode (Clean Feed)</td><td>10kΩ balanced 0dB</td></tr><tr><td>Input Impedance-Microphone Mode</td><td>200Ω balanced</td></tr><tr><td>Clean Feed Limiting Input</td><td>+4dBu</td></tr><tr><td>Microphone Level Range by preset pots</td><td>74Db to 40Db adjusted</td></tr><tr><td>Bandwidth to telephone line ref 1kHz</td><td>250Hz - 4kHz, -3dB</td></tr><tr><td>Telephone Line Impedance:</td><td>Nominally 600Ω</td></tr><tr><td>Telephone Line Impedance Range:</td><td>300Ω to 1500Ω</td></tr><tr><td>Output Impedance: 0dBu</td><td>50Ω balanced floating</td></tr><tr><td>Output Level Range: adjusted by preset pot</td><td>+8dB to -14dB</td></tr><tr><td>Rejection Ratio:</td><td>45dB on 1kHz tone, typically 28dB on complex waveforms, reference peak level of 0dB</td></tr><tr><td>Mic/Line Input:</td><td>XLR 3 pin female with push button mic/line selection</td></tr><tr><td>Line Output:</td><td>XLR 3 pin male</td></tr><tr><td>Telephone Line:</td><td>RJ11 6/4 socket</td></tr><tr><td>Telephone Handset/Instrument:</td><td>RJ11 6/4 socket</td></tr></table> <p>19” Rack Mounted</p>	Input Impedance – Line Mode (Clean Feed)	10kΩ balanced 0dB	Input Impedance-Microphone Mode	200Ω balanced	Clean Feed Limiting Input	+4dBu	Microphone Level Range by preset pots	74Db to 40Db adjusted	Bandwidth to telephone line ref 1kHz	250Hz - 4kHz, -3dB	Telephone Line Impedance:	Nominally 600Ω	Telephone Line Impedance Range:	300Ω to 1500Ω	Output Impedance: 0dBu	50Ω balanced floating	Output Level Range: adjusted by preset pot	+8dB to -14dB	Rejection Ratio:	45dB on 1kHz tone, typically 28dB on complex waveforms, reference peak level of 0dB	Mic/Line Input:	XLR 3 pin female with push button mic/line selection	Line Output:	XLR 3 pin male	Telephone Line:	RJ11 6/4 socket	Telephone Handset/Instrument:	RJ11 6/4 socket	6
Input Impedance – Line Mode (Clean Feed)	10kΩ balanced 0dB																													
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	Power : Auto Adjusting, 100-240VAC	
InterCom System		
76	<p>Intercom Matrix Frame.</p> <ul style="list-style-type: none"> • Frame with user menu and RJ-45 programmable panel/4-wire ports and 4 4-wire in/ out ports with Dual-redundant PSUs. • 19" rack mount Central Processor • Rack mount Ethernet based Communication Controllers to interface to the local control racks • Surge protection and lightning protection is required • Digital Voice Recording System located within an equipment rack • Alarm calls capability shall be incorporated • Tamper calls : initiated when an attempt is made to gain unauthorized access to intercom station electronics • Data Integrity: In times of power failure, the actual status information in the system at the time of the failure shall not be lost. When the power is reconnected, all status information at the time of the power failure shall be retrievable. • The System shall be capable of automatically detecting excessive Audio Levels, • The system is expected to link all the studio facilities with provision for expansion to other areas of operations 	
Other Equipment for system		
77	Broadcast Loudness Meter	10
78	D21-Master Sync Generator	10
79	Volume Controller	10
80	On-Line Broadcast Delay	12
81	Stereo Reverb/Effects Processor	10
82	AES/EBU digital audio distribution amplifier (1:4)	26
83	Analog audio distribution amplifier(mono 1:8)	26
84	Frame,2RU with fan,includes one 6822+AC power supply and Ethernet resource card	13
85	AC power supply for FR6822+QXFE	13
86	DI Box	26
87	16 XLR female to 16 BNC female	
88	16 XLR male to 16 BNC female	
89	8 channels, pre-selection from 1 of 2 groups of 16 analog inputs, independent selection of 1 of 4 mono-sources to left and right output. 8 analog inputs by "Phoenix" connectors, XLR output of selected channels. 4 x 53 segment high-resolution level meters showing simultaneous PPM over VU. Push button channel selection and summing of analog channels.	13
90	1RU, Self-Powered Speaker System, 2 HD/SD-SDI Auto-Sensing Inputs on BNC, 1 Re-Clocked HD/SD-SDI Output on BNC, Front Panel Selection of any 2 of 4 SDI Groups for monitoring and conversion,	13

	Unbalanced AES/EBU Outputs on HD-15 de-embedded from any 2 selected groups of HD/SD-SDI, 4 unbalanced AES/EBU Inputs on BNC, 8 Balanced Analog Inputs on DB-25, 8 Balanced Analog Outputs of Metered Audio, 2 Analog Outputs of selected channels on XLRs, 8 x 26-Segment, High-Resolution Level Meters showing multaneous PPM over VU, LCD display of system status and Phase Correlation.	
Monitor Equipment		
91	Two-way Active Nearfield Monitor	26
92	Compact active studio monitor	26
93	Active subwoofer	26
94	Headphone	60
Microphone		
95	short gun interference tube microphone,with Microphone wind muff,Pistol Grip,Blimp windscreen Comment:	130
96	Electret condenser lavalier microphones	100
97	Omni-Directional Handheld Dynamic ENG Microphone with Extended Handle	100
Closed Circuit Television		
98	<p>The solution should provide for complete surveillance of the broadcast station</p> <p>Features:</p> <ul style="list-style-type: none"> • 20 x Optical Zoom • Extremely low light capture • Megapixel resolution (1600 x 1200) to capture small details and better identify subjects • Quad streaming MPEG4/JPEG video • Up to 30 frames per second • Pan range of -175° to +175° • Tilt range of +90° to -23° • 4X digital zoom • Auto Pan • Auto Patrol restricted • Preset 20 positions • The recording software should allow for viewing and recording up to sixteen cameras. • Two-way audio • Micro SD card slot for local recording for 1 week • 0.2 lux minimum illumination <p>Storage : Capable of storing images for 3 months after which the info is achieved.</p>	3
Console and Racks		
99	Giant display wall 4 x 42" Display 5mm seam gaps between screens	4

100	Standard Video Console	4
101	Standard Audio Console	4
102	Equipment Racks based on the equipment to be supplied	
MEDIA CONVERSION		
103	Integrated Multimedia Data Management System <ul style="list-style-type: none"> • Umatic Machines, x 6 • Betacam Machines for Conversions x 6 • Digital Catalogue Computing System, • Disk Array for Data Storage to store 6000hours of archive material, • Indexing Server System for the 6000hrs 	2
	System Integration	
104	For the audiovisual system	
OUTSIDE BROADCASTING VANS		
105	<ul style="list-style-type: none"> • State of the Art Outside Broadcast Technology • 8 Camera Chain • 3 x Slow Motion Equipment System • 32 x 32 Vision Mixer • 32 x 32 Audio Mixer • In built Power conditioning • Air-conditioned • 2 x Microwave links • 12 m x 3m x 4m (Lx WxH) Studio structure • DVD R/W 	2
REHABILITATION OF EXISTING OUTSIDE BROADCASTING VAN		
106	<ul style="list-style-type: none"> • Modernize existing OB Van to state of Art • 6 Camera Chain • 2 x Slow Motion • 32 x 32 Vision Mixer • 32 x 32 Audio Mixer • In built Power conditioning • Air-conditioned 	1
TWO(2) NEW STUDIOS FULL HOUSE		
107	<ul style="list-style-type: none"> • Build 1200m² Studio • 4 Camera Chain Studio • Professional Pedestal • Cool lighting system • All studio accessories 	2

GENERATOR SET		
108	<ul style="list-style-type: none">Lusaka – 800kVA	1

Forms and Procedures

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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^o: _____
IFB N^o: _____

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^o: _____
IFB N^o: _____

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:

Home Office	CR-H-nnn
Site	CR-S-nnn

- (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. _____⁷:
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: _____⁸

(a)	Engineering	(Amount)
(i)	Engineer _____ hrs x _____ rate/hr =	_____
(ii)	Draftsperson _____ hrs x _____ rate/hr =	_____
	Sub-total _____ hrs	_____
	Total Engineering Cost	_____
(b)	Other Cost	_____
	Total Cost (a) + (b)	_____

⁸ Costs shall be in the currencies of the Contract.

(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:

<u>Drawing/Document No.</u>	<u>Description</u>
8. Estimate of increase/decrease to the Contract Price resulting from Change Proposal:⁹

(Amount)

(a) Direct material	
(b) Major construction equipment	

⁹ Costs shall be in the currencies of the Contract.

- (c) Direct field labor (Total _____ hrs) _____
- (d) Subcontracts _____
- (e) Indirect material and labor _____
- (f) Site supervision _____
- (g) Head office technical staff salaries

Process engineer	_____ hrs @ _____ rate/hr	_____
Project engineer	_____ hrs @ _____ rate/hr	_____
Equipment engineer	_____ hrs @ _____ rate/hr	_____
Procurement	_____ hrs @ _____ rate/hr	_____
Draftsperson	_____ hrs @ _____ rate/hr	_____
Total	_____ hrs	_____

- (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 _____
(Sum of items (a) to (j))

Cost to prepare Estimate for Change Proposal _____
(Amount payable if Change is not accepted)

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

(Contractor's Name)

(Signature)

(Name of signatory)

(Title of signatory)

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: _____
(Employer)

Date: _____

Accepted by: _____
(Contractor)

Date: _____

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:

<u>Drawing/Document No.</u>	<u>Description</u>
-----------------------------	--------------------
7. Adjustment of Time for Completion:
8. Other change in the Contract terms:
9. Other terms and conditions:

(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

Supplementary Information

PART 3 – Conditions of Contract and Contract Forms

Section VII. General Conditions (GC)

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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.

“Contract Documents” means the documents listed in Article 1.1 (Contract Documents) of the Contract Agreement (including any amendments thereto).

“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 sub-contracted 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, precommissioning, 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 ZPPA 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 Precommissioning 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.

“Precommissioning” 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 1^{er}, 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, subconsultants, 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 party¹⁰;
- (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 obligation¹¹;
- (iii) “collusive practice” is an arrangement between two or more parties¹² 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 party¹³ 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 Purchaser 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

¹⁰ “Another party” refers to a public official acting in relation to the procurement process or contract execution]. In this context, “public official” includes Purchaser’s staff and employees of other organizations taking or reviewing procurement decisions.

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.

of the Bank's inspection and audit rights provided for under Sub-Clause 9.8.

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, Precommissioning 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, 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 Purchaser to inspect the Contractor's accounts and records relating to the performance of the Contract and to have them audited by auditors appointed by the Purchaser, if so required by the Purchaser.
- 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 subconsultants to permit, the Purchaser and/or persons appointed by the Purchaser 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 Purchaser if requested by the Purchaser. The Contractor's and its Subcontractors' and subconsultants' 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 Purchaser's inspection and audit rights provided for under Sub-Clause 9.8 constitute a prohibited practice subject to contract termination .

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 Precommissioning, 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 Duties

14.1 Except as otherwise specifically provided in the Contract, the Contractor shall bear and pay all taxes, duties, levies and 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.

Intellectual Property

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 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 precommission 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 Subcontractors, specifies major items of supply or services and a list of approved Subcontractors against each item, including manufacturers. Insofar 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.

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.

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.

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 accordance with GC Sub-Clause 6.1.

- 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 Precommissioning 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 Precommissioning 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 Precommissioning 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 Precommissioning 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 Acceptance Certificate.

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 Precommissioning and/or Guarantee Test

25.5.1 In the event that the Contractor is unable to proceed with the Precommissioning 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 Precommissioning, the Contractor shall proceed without delay in performing Precommissioning 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-Clauses 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;
Indemnifica-
tion**

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 there after 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-Clauses 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-Clauses

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-Clauses 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 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-Clauses 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 or 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,
- (b) experienced in the interpretation of contract documentation, and
- (c) fluent in the language for communications defined in the Contract.

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

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.

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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.

PC 1. Definitions

The Employer is: **Ministry of Information and Broadcasting**

The Project Manager is: **Ministry of Information and Broadcasting Services**

Country of Origin: **all countries and territories as indicated in Section V of the bidding documents, Eligible Countries.**

PC 5. Law and Language

PC 5.1 The Contract shall be interpreted in accordance with the laws of: **Laws of Zambia.**

PC 5.2 The ruling language is: **English**

PC 5.3 The language for communications is: **English**

PC 7. Scope of Facilities [Spare Parts] (GC Clause 7)

PC 7.3 The Contractor agrees to supply spare parts for a period of years:

Ten (10) Years

Sample Addition to PC 7.3

The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the 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.

PC 8. Time for Commencement and Completion

PC 8.1 The Contractor shall commence work on the Facilities within **60 days** from the Effective Date for determining Time for Completion as specified in the Contract Agreement.

PC 8.2 The Time for Completion of the whole of the Facilities shall be within **365 to 547 days** from the Effective Date as described in the Contract Agreement.

PC 11. Contract Price

PC 11.2 The Contract Price **shall not** be adjusted in accordance with the provisions of the Appendix to the Contract Agreement titled Adjustment Clause.

PC 13. Securities

PC 13.3.1 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: **ten percent (10%)**

PC 13.3.2 The performance security shall be in the form of the **~~-Bank Guarantee~~ issued by a bank resident in Zambia** attached hereto in Section IX, Contract Forms.

PC 13.3.3 The performance security shall not be reduced on the date of the Operational Acceptance.

PC 13.3.3 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.

PC 22 Installation

PC 22.2.5 Working Hours

Normal working hours are: **08:00hrs to 13:00hrs and 14:00hrs to 17:00hrs Monday to Friday and 08:00hrs to 13:00hrs on Saturday. Sundays and all public holidays are not working days.**

PC 22.2.8 Funeral Arrangements: **Cost of coffin and an allowance shall be paid to an employee in the event of death of biological parents or children or paid to the family in the event of death of an employee. Total sum shall not be less than US\$200.00**

PC 25. Commissioning and Operational Acceptance

PC 25.2.2 The Guarantee Test of the Facilities shall be successfully completed within **30 days** from the date of Completion.

PC 26. Completion Time Guarantee

PC 26.2

Applicable rate for liquidated damages: **0.2%** per week

The above rate applies to the price of the part of the Facilities, as quoted in the Price Schedule, for that part for which the Contractor fails to achieve Completion within the particular Time for Completion.

Maximum deduction for liquidated damages: **ten percent (10%)**

PC 26.3

Applicable (*amount or rate*) for the bonus for early Completion:

Maximum bonus: **Not Applicable**

PC 26.3 **No bonus will be given for earlier Completion of the Facilities or part thereof.**

PC 27. Defect Liability

PC 27.1 The critical components covered under the extended defect liability are _____, and the period shall be **twenty-four months**

PC 30. Limitation of Liability

Sample Clause

PC 30.1 (b) The multiplier of the Contract Price is: **110%**

PC 46. Disputes and Arbitration

PC 46.1 The DB shall be appointed within 28 days after the Effective Date.

PC 46.1 The DB shall be: **not more than three members and shall be mutually agreed**

PC 46.1 List of potential DB members is: **Members of Engineering Institute of Zambia and Computer Society of Zambia**

PC 46.2 Appointment (if not agreed) to be made by: **Engineering Institute of Zambia**

PC 46.5 Procedure to settle disputes in respect of DB's decisions: _____

(a) Appointed arbitration institution: **Zambia Institute of Arbitration/Law Association of Zambia**

Section IX. - Contract Forms

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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.

Sixty percent (60%) of the total or pro rata DDP amount upon Incoterm “DDP”, upon delivery to the carrier within forty-five (45) days after receipt of documents.

Fifteen percent (15%) of the total or pro rata DDP amount upon issue of the Completion Certificate, within forty-five (45) days after receipt of invoice.

Fifteen percent (15%) of the total or pro rata DDP 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.

Seventy percent (70%) 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.

Ten percent (10%) of the total or pro rata EXW amount upon issue of the Completion Certificate, within forty-five (45) days after receipt of invoice.

Ten percent (10%) 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 percent (1%) per month 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:

Appendix 2. Price Adjustment

The prices shall remain firm and fixed for the duration of the Contract.

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.

<u>Amount</u>	<u>Deductible limits</u>	<u>Parties insured</u>	<u>From</u>	<u>To</u>
---------------	--------------------------	------------------------	-------------	-----------

(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.

<u>Amount</u>	<u>Deductible limits</u>	<u>Parties insured</u>	<u>From</u>	<u>To</u>
---------------	--------------------------	------------------------	-------------	-----------

(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.

<u>Amount</u>	<u>Deductible limits</u>	<u>Parties insured</u>	<u>From</u>	<u>To</u>
---------------	--------------------------	------------------------	-------------	-----------

(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 is also required to take out and maintain at its own cost the following insurances:

Details:

<u>Amount</u>	<u>Deductible limits</u>	<u>Parties insured</u>	<u>From</u>	<u>To</u>
---------------	--------------------------	------------------------	-------------	-----------

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

The Employer shall at its expense take out and maintain in effect during the performance of the Contract the following insurances.

Details:

<u>Amount</u>	<u>Deductible limits</u>	<u>Parties insured</u>	<u>From</u>	<u>To</u>
---------------	--------------------------	------------------------	-------------	-----------

Appendix 4. Time Schedule

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.

Major Items of Plant and Installation Services	Approved Subcontractors/Manufacturers	Nationality

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.

Personnel

Charge to Contractor (if any)

Facilities

Charge to Contractor (if any)

Works

Charge to Contractor (if any)

Supplies

Charge to Contractor (if any)

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 for

A. Approval

1. monthly progress reports summarizing:

- Results accomplished during the period under review
- Cumulative deviations from schedule of progress milestones as specified in the Agreed and Finalised Project Plan;
- Corrective actions to be taken to return to planned schedule of progress and proposed revisions to planned schedule
- Issues outstanding including proposed actions to be taken
- Resources that the supplier expects to be provided by the Purchaser and/or actions to be taken by the Purchaser in the next reporting period
- Other issues or potential problems the Supplier foresees that could impact on project progress.

B. Review

1. Other reports to monitor contract performance/progress with systems implementation:

- Inspection and quality assurance reports
- Training participants tests results
- Overall project performance and impact

Appendix 8. Functional Guarantees

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*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 _____ (____)¹⁵, 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:¹⁶

- (a) twelve months after our receipt of either (a) or (b) above; or
- (b) eighteen months after our receipt of:

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).

- (i) a copy of the Completion Certificate; or
- (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

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.¹⁸ Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

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.”

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

[signature(s) name of bank or financial institution]

