

1. INSTRUCTIONS TO BIDDERS (ITB)

01. INSTRUCTIONS TO BIDDERS (ITB)

1.1 Introduction

1.1.1 Chairman, Ministry Procurement Committee (MPC), Ministry of Petroleum Industries on behalf of the Ceylon Petroleum Corporation (CPC) is calling Bids from reputed Aircraft Refueller Manufacturers, their Export Agents abroad or their Accredited Local Agents, for the supply of 01 No. 30,000 Litre Capacity, Low Profile, Semi-Trailer, Aircraft Refueller

1.1.2 Any intending bidder shall have past supply records of Aircraft Refuellers on commercial use in the International market for the last 10 years, which shall include International Airports in minimum of five different countries outside the Country of Manufacture together with supplier details & user recommendations.

1.2 Basis of Bid

1.2.1 Bids are to be forwarded on C & F basis for the supply of 01. No. 30,000 Litre capacity, Low Profile, Semi-Trailer, Aircraft Refueller to CPC in completely assembled form with all test reports, manufacturer's data sheets/books, detail drawings in three sets (Original and two duplicates) and following manuals / catalogues as indicated.

*Engine & Chassis / prime mover: Spare Part Catalogue - one hard copy
Workshop Manual - one hard copy*

*Refueller Module: Operations & Maintenance Manual – one hard copy
Spare Part Catalogue - one hard copy*

*Further the Cost of pre-shipment Inspection by an Internationally recognized Independent Third Party Inspector approved by CPC, the cost of Witness of Third Party Inspection & Performance Inspection of the Aircraft Refueller prior to delivery by two (02) CPC officers, the cost for technical training for CPC maintenance staff as per Conditions of Contract (COC) **Clause 2.2 & 2.3**, the cost of Workshop Manual and Spare Parts Catalogue for the Chassis / prime mover, shall be included separately in Schedule of Prices(Schedule – A).*

1.2.2 Additional services provided by the Bidder not covered in this Instruction to Bidders shall be stated clearly. If no exceptions are stated, MPC would assume that Bidder conforms to most stringent conditions of the Bid document.

1.2.3 Bidder shall guarantee availability of after sales service facilities in Sri Lanka for the chassis / prime mover and refueller module offered. However, the Chassis / prime mover Manufacturer shall be represented in Sri Lanka by an Accredited Local Agent in Sri Lanka who is technically competent to undertake any repairs and to provide After Sales Services.

1.2.4 Bids are to be forwarded for the Supply of 01 No. 30,000 Litre Capacity, Low Profile, Semi-Trailer, Aircraft Refueller as per the Technical Specifications stipulated in the Bid document.

1.2.5 If the Bidder wishes to submit alternative offers from different Refueller Manufacturers such alternative offers shall be submitted with separate Bid Securities.

1.2.6 All documentation & correspondence shall be furnished in English Language.

1.3 Bid Document

1.3.1 Bid Document will consist of the following:

Invitation to Bid

Instructions to Bidders (ITB)

Conditions of Contract (COC)

Technical Specifications

Schedule of Prices

Form of Bid

Format for Bid Security

Form of Agreement

Format for Performance Guarantee

1.3.2 The bidders are not permitted to do any alterations in the Bid document in any form whatsoever. Any such alterations in the Bid document by the bidder, may be liable for disqualification.

1.4 Documents to accompany the Bid

Bidder shall furnish the following documents along with the offer. .

1.4.1 Name of Refueller Manufacturer and Country of Origin.

1.4.2 Company profile of the Refueller Manufacturer

1.4.3 Detailed technical specification of the Aircraft Refueller model offered covering chassis / prime mover and all major components

1.4.4 Certificate from the Manufacturer that the Aircraft Refueller model offered is of currently in manufacture and availability of spares for a minimum period of 10 years

1.4.5 Name and address of the Accredited Local Agent for the Aircraft Refueller along with Legally Executed Power of Attorney issued by the Refueller Manufacturer and valid copy of Certificate of Registration issued by the Registrar of Companies

1.4.6 Name and address of the Accredited Local Agent of the Chassis / prime

mover manufacturer along with Legally Executed Power of Attorney issued by the Chassis / prime mover Manufacturer and valid copy of Certificate of Registration issued by the Registrar of Companies

1.4.7 *The Chassis / prime mover brand offered shall be essentially represented by an Accredited Local Agent in Sri Lanka who is capable of providing warranty services/repairs as well as after sales services & spare part requirements. A Commitment Letter from the Accredited Local Agent of the Chassis / prime mover Manufacturer declaring the agreement for providing after sales services aforesaid & supply of spares for the next 10 years period, shall be forwarded along with the offer.*

The Accredited Local Agent of the Chassis / prime mover Manufacturer in Sri Lanka shall provide documentary evidence on import & supply of minimum of 30 units of heavy vehicles of the Chassis / prime mover Brand offered to Sri Lankan market during the past 10 years.

1.4.8 *Inspection / Performance Testing criteria of the Aircraft Refueller and agreement to furnish test certificates on delivery of the Aircraft Refueller*

1.4.9 *Manufacturing Schedule and Manufacturing Quality Plan*

1.4.10 *Past performance – Bidder shall forward their past supply records of Aircraft Refuellers on commercial use in the International Market for the last 10 years, which shall include International Airports in minimum of five different countries outside the country of manufacture together with supplier details and user recommendation.*

1.4.11 *Every Bidder shall specify the conditions of warranty offered on time/volume basis for the Chassis / prime mover and Refueller module separately.*

1.4.12 *A Commitment Letter from the bidder that all major breakdowns and / or repairs within the warranty period can be undertaken on urgent basis through his Local Agent. Therefore, the Local Agent shall be well equipped, capable of handling repairs of Chassis / prime mover, Engine and Refueller module and such details shall be attached to the offer.*

1.4.13 *Bidder to provide a list of recommended spare parts with prices separately, for Chassis / prime mover & Refueller module for 02 years operations.*

1.4.14 *A dimensional drawing showing key dimensions of the layout of the entire Aircraft Refueller. It shall include dimensions of the platform, operational panel, height of the Refueller, width of the Refueller and distance between the front end of the Refueller tank and rear of the cab*

1.4.15 *Flow Schematic Diagrams for Fuel, Hydraulic, Pneumatic Systems and Electrical (Double Pole) Wiring.*

1.4.16 *Schedule of Prices (Schedule A) duly completed and signed.*

1.4.17 *Copy of Receipt of payment of Bid Document fee of Rs. 5000.00.*

1.4.18 *Form of Bid (Annexure B) duly completed and signed.*

- 1.4.19 Bid Security (as per Annexure C).
1.4.20 Shipment schedule
1.4.21 Form of Compliance / Deviation Sheet – (Annexure F) duly
Completed & signed & stamped with company seal.

Important:

Failure to furnish the mandatory documents, compliance to requirements listed in the Form of Compliance / Deviation Sheet - Annexure F, before the closing of Bid will result in the Bid being rejected.

1.5 Sealing and Marking of Bids

- 1.5.1 Bid shall be submitted in duplicate as per the conditions specified in this Bid document. The original and the duplicate of the Bid shall be placed in separate envelopes marked '**ORIGINAL**' and '**DUPLICATE**'. Both envelopes shall be enclosed in one securely sealed cover, which shall be marked "**BID FOR THE SUPPLY OF 01 NO. 30,000 LITRE CAPACITY, LOW PROFILE, SEMI-TRAILER, AIRCRAFT REFUELLER**" (the Invitation to Bid title) on the top left hand corner and the statement, "**DO NOT OPEN BEFORE 1400 hrs. on 09.09.2010**" (to be completed with the time and date specified in the Bid document) and shall be addressed to:

Chairman,
Ministry Procurement Committee,
Bid for the supply of 01 No. 30,000 Litre Capacity, Low Profile, Semi-Trailer,
Aircraft Refueller
c/o. Supplies Function,
Ceylon Petroleum Corporation,
1st Floor, Rotunda Tower,
No. 109, Galle Road,
Colombo 03, Sri Lanka.
Tel: 0094 11 2473662 Facsimile: 0094 11 2473979/2541592

- 1.5.2 If the outer envelope is not sealed and marked as required above, the MPC will assume no responsibility for the Bids being misplaced or premature opening. If the outer envelope discloses the Bidder's identity, the MPC will not guarantee anonymity of the Bid submission but this disclosure will not constitute grounds for Bid rejection.

- 1.5.3 Bids, sealed and addressed as aforesaid, shall be sent under Registered cover to reach :

Chairman
Ministry Procurement Committee,
Bid for the supply of 01 No. 30,000 Litre Capacity, Low Profile Semi-Trailer,
Aircraft Refueller
C/o. Supplies Function,

Ceylon Petroleum Corporation,
1st Floor, Rotunda Tower,
No. 109, Galle Road,
Colombo 03,
Sri Lanka.
Not later than 1400 hrs. Sri Lanka local time on 09.09.2010

1.6 Period of validity of Bids

- 1.6.1 All Bids shall be valid for a **minimum period of 91 (Ninety one) days** from the closing date of the Bids. Bidders shall however, clearly indicate the maximum period that their offer would be valid. **A Bid valid for a shorter period will be considered as non-responsive.**
- 1.6.2 Cost & Freight (C & F) prices indicated in the Schedule of Prices, (Schedule A) (Clause 1.16 below) shall be firm and shall not be subjected to any price variation within the period of validity stated in (1.6.1) above.

1.7 Format and Signing of Bids

- 1.7.1 The Bidder shall prepare an **Original and a Duplicate** of the Bid specified above clearly marking as "**BID FOR THE SUPPLY OF 01 NO. 30,000 LITRE CAPACITY, LOW PROFILE, SEMI-TRAILER, AIRCRAFT REFUELLER**" **Original and Duplicate** as appropriate. In the event of any discrepancy between the Original and Duplicate, the Original shall govern.
- 1.7.2 The Original and the Duplicate of the Bid shall be typed, or written in indelible ink, and shall be signed by the Bidder, or person(s) duly authorized to bind the Bidder to the Contract. **All pages of the Bid except for un-amended printed literature shall be initialled by the person(s) signing the Bid.**
- 1.7.3 Any inter lineation, erasures or insertion shall be valid only if they are initialled by the person(s) signing the Bid. All corrections shall be very clear and no overwriting shall be accepted.

1.8 Clarification of Bid Document

- 1.8.1 A prospective Bidder requiring any clarification of the Bid document shall notify CPC in writing by hand or post or facsimile at the CPC's mailing address indicated in ITB clause 1.5.

1.8.2 Bidder shall request in writing any clarification of the Bid document not later than fourteen (14) days prior to the deadline for submission of Bids prescribed by the CPC. Copies of the CPC's response will be sent to all prospective Bidders who have collected Bid documents within seven (07) days prior to the closing of the Bid.

1.8.3 All correspondence shall be addressed to:

Chairman
Ministry Procurement Committee,
Bid for the supply of 01 No. 30,000 Litre Capacity, Low Profile, Semi-
Trailer, Aircraft Refueller
c/o. Supplies Function,
Ceylon Petroleum Corporation,
1st Floor, Rotunda Tower,
No. 109, Galle Road,
Colombo 03,
Sri Lanka.,

and shall not be personally addressed to any officer. Such correspondence shall not be entertained and shall be considered as a disqualification.

1.9 Deadline for submission of Bids

1.9.1 Chairman, Ministry Procurement Committee will receive Bids at the address specified under ITB Clause 1.5 not later than 1400 hrs. on 09.09.2010.

1.9.2 Ministry Procurement Committee may, at its discretion, extend the deadline for submission of Bids, by amending the Bid document in which case all rights and obligations of MPC and the Bidders will thereafter be subjected to the deadline as extended.

1.10 Late Bids

Any Bid received by the Chairman, MPC after the deadline for submission of Bids, will not be considered and returned unopened to the Bidder.

1.11 Modification, Substitution & Withdrawal of Bids

1.11.1 The Bidder may modify or withdraw his Bid after submission, provided that written notice of the modification or withdrawal is received by the CPC prior to the deadline prescribed for Bid submission.

1.11.2 *The Bidder's modifications shall be prepared, sealed, marked and despatched as follows:*

The Bidders shall provide an Original and a Duplicate, as specified in the ITB clause 1.7 of any modifications to his Bid, clearly identified and in two

*envelopes, duly marked “**BID FOR THE SUPPLY OF 01 NO. 30,000 LITRE CAPACITY, LOW PROFILE, SEMI TRAILER, AIRCRAFT REFUELLER**”*

*The envelopes shall be sealed in an outer envelope, duly marked “**BID MODIFICATIONS**”.*

1.11.3 *A Bidder wishing to withdraw his Bid shall notify the CPC in writing prior to the deadline prescribed for the submission of Bids. A withdrawal notice may also be sent by Facsimile, but must be followed by the original, by post or by hand not later than the deadline for submission of Bids. The notice of withdrawal shall be addressed to the: -*

*Chairman
Ministry Procurement Committee,
Bid for the supply of 01 No. 30,000 Litre Capacity, Low Profile,
Semi Trailer, Aircraft Refueller
c/o Supplies Function,
Ceylon Petroleum Corporation,
1st Floor, Rotunda Tower,
No. 109, Galle Road,
Colombo 03,
Sri Lanka.,*

*bearing the Bid name and the words “**BID WITHDRAWAL NOTICE**”.*

1.11.4 *Bid withdrawal notices received after the deadline for submission of Bids will be ignored, and the submitted Bids will deem to be valid.*

1.12 Closing of Bids

Bids, sealed and addressed as aforesaid shall be sent under Registered Cover to reach:

*Chairman,
Ministry Procurement Committee,
Bid for the Supply of 01 No. 30,000 Litre Capacity, Low Profile, Semi-Trailer,
Aircraft Refueller
c/o Supplies Function
Ceylon Petroleum Corporation,*

*1st Floor, Rotunda Tower,
No. 109, Galle Road,
Colombo 03,
Sri Lanka.,*

not later than 1400 hrs Sri Lanka local time on 09.09.2010. If the Bidders or their representatives choose not to send their Bids under Registered Cover, they could deposit such Bids in the Tender Box provided for this purpose at the office of the

*Manager Supplies
Supplies Function,
Ceylon Petroleum Corporation,
1st Floor, Rotunda Tower,
109, Galle Road,
Colombo 3,
Sri Lanka.*

1.13 Opening of Bids

1.13.1 Bids will be opened immediately after the closing date and time fixed for receipt of Bids, at the

*Manager Supplies' Office,
Ceylon Petroleum Corporation,
1st Floor, Rotunda Tower,
109, Galle Road,
Colombo 3,
Sri Lanka*

1.13.2 The Chairman, MPC or his nominated representative will open the Bids, in the presence of the Bidders and / or their representatives, who choose to attend at the time on the date and at the opening place specified in the Invitation to Bid. Bidders and / or their representatives so attending shall sign a register as proof of their attendance.

1.13.3 The Bid prices, discounts, and Bidder's names, the presence or absence of the requisite Bid Security and other such details, will be announced, at the opening.

1.13.4 Bids and modifications sent pursuant to ITB Sub Clause 1.11 that are not opened will not be considered for evaluation, regardless of the circumstances.

1.14 Agent to hold Power of Attorney

1.14.1 *Bids from Accredited Local Agents representing Manufacturers or from Manufacturers' Export Agents abroad will not be considered unless they hold Legally Executed Power of Attorney from the Manufacturer, empowering the*

Agent to offer on his behalf, to enter in to a valid agreement on behalf of Manufacturer to fulfil all the terms and conditions of the contract, in the event of the Bid being awarded.

1.14.2 *An Agent signing the Bid document on behalf of the Manufacturer shall state Manufacturer's name, address, telephone nos., fax nos., if any. Original of the **Legally Executed Power of Attorney** shall be attached to the offer. Under no circumstances, will a letter of Authority be accepted.*

1.14.3 *Nomination of an Agent after the Bid has been submitted will not be valid.*

1.14.4 *Local Agent shall also forward valid copy of their Business Registration issued by the Registrar of Companies together with their offer.*

1.15 Bid Security

1.15.1 *Each Bid shall be accompanied by a Bid Security, undertaking that the Bid will be held valid for the specified period, and that the Bid will not be withdrawn during that period. Such security shall be in the form of a Bank Draft or a Bank Guarantee issued by a recognized commercial Bank in Sri Lanka or a foreign bank with the guarantee confirmed by a recognized commercial bank operating in Sri Lanka, and approved by the Central Bank of Sri Lanka and payable to the CPC on demand in a sum of Rupees One Million only (Rs. 1,000,000/=).*

1.15.2 *The Bid Security shall be valid for 121 (One Hundred and Twenty One) days from the date of closing of Bid. A format of Bid Security is attached in Annexure "C".*

1.15.3 *Failure to submit the Bid Security at the time, or before the closing of Bid, and in accordance with above said requirements, and in the format provided, will result in the Bid being rejected.*

1.15.4 *Bid Security from unsuccessful Bidders will be returned to them after the award is made to the successful Bidder. The Bid Security of the successful Bidder will be returned only after receipt of the **Performance Guarantee**.*

1.16 Schedule of Prices

- 1.16.1 Bids shall be in the form of a Pro-forma Invoice in Three (03) copies indicating Country of Origin, Port of Shipment, H.S. Code, Terms of Payment, Delivery Period and Offer Validity. Rates quoted shall be computed on the basis of C & F Colombo, showing Free on Board (FOB) value and freight charges separately.*
- 1.16.2 Bidders are also required to duly sign and return the Schedule of Prices - marked Schedule A, indicating their Bids in detail together with the Pro-forma Invoice.*
- 1.16.3 Prospective Bidders are requested to submit their offers in any single foreign currency, freely convertible in Sri Lanka.*
- 1.16.4 All Agent's Commissions, (if any), shall be disclosed in Sri Lanka Rupees in the appropriate column of the Schedule of Prices.*
- 1.16.5 Prices not submitted on the prescribed form and in the manner required are liable for rejection.*

1.17 Preliminary Examination of Bids

- 1.17.1 The MPC will examine the Bids to determine whether they are complete, any computational errors have been made, whether the documents have been properly signed, and the Bids are generally in order. The MPC may, at its discretion call clarifications from Bidders.*
- 1.17.2 The request for clarification and the response shall be in writing within short period from the clarifications and no change in the price or substance of the Bid shall be sought, offered or permitted.*

1.18 Corrections of Errors

Bids determined to be substantially responsive will be checked for any arithmetical errors and errors will be corrected in the following manner.

- 1.18.1 Where the discrepancy is between the amount in figure and the amount in words, the amount in words will prevail.*

1.18.2 Where the discrepancy is between unit rate and the line total, resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, unless in the opinion of the Chairman, Ministry Procurement Committee, (MPC) there is an obvious gross misplacement of the decimal point in the rate, in which case the line item total as quoted will govern, and the unit rate will be corrected.

1.18.3 The amount stated in the form of Bid adjusted in accordance with the above procedure with the concurrence of the Bidder shall be considered as binding upon the Bidder. If the Bidder does not accept the correct amount of Bid, his Bid shall be rejected without affecting the Bid Security.

1.18.4 Where the adjusted price is lower than the bid price the adjusted figure will be treated as bid price. If the adjusted price is higher than the bid price the bided figure will be the bid price. The rates will be adjusted with the concurrence of the bidder to reach the bided figure. If the bidder does not agree for such adjustment, his bid shall be rejected without affecting the Bid Security.

1.19 Conversion to Single Currency

To facilitate evaluation & comparison of Bids, all prices quoted in foreign currency will be converted to Sri Lankan Rupees at the Selling Exchange Rate of the Treasury Division of People's Bank of Sri Lanka, prevailing on the date of opening of Bids.

1.20 Evaluation of Bids

1.20.1 The MPC will carry out a detailed evaluation of the Bids, with the assistance of Ministry Appointed Technical Evaluation Committee, to determine whether the Technical aspects are properly addressed, and the Bids are substantially responsive.

1.20.2 The evaluation methodology will comprise:

1.20.2.1 Technical requirements:

Specifications, drawings and supporting technical documents in compliance with Technical Specifications of this Bid document including the information / details requested under Clause 1.4 of ITB

1.20.2.2 Financial Evaluation of Bids

The comparison of the total C&F price for 01 No. 30,000 Litre Capacity, Low Profile, Semi Trailer, Aircraft Refueller, discounts and Local Agency Commission if any, will be evaluated.

1.20.3 *In addition to the Bid prices indicated in the schedule, the following factors will also be considered in the evaluation.*

- ✓ *Availability of spare parts as per sub clause 1.4.4 & 1.4.7 of ITB.*
- ✓ *Prices of spare parts as per sub clause 1.4.13 of ITB.*
- ✓ *Past supply records as per sub clause 1.4.7 & 1.4.10 of ITB.*
- ✓ *Shipment Schedule as per sub clause 2.6.3 of COC*
- ✓ *Availability of After Sales Services as per sub clause 1.4.7 and 1.4.12 of ITB*

1.21 Right to accept or reject any or all Bids

1.21.1 *The Ministry Procurement Committee will not be bound to make the award to the bidder submitting the lowest bid.*

1.21.2 *The Ministry Procurement Committee reserves the right to reject any or all Bids, without adducing any reasons. The Ministry Procurement Committee reserves the right to increase the number of Refueller units to be contracted for, at prices indicated in the Schedule of Prices.*

1.21.3 *The notice of acceptance of Bid will be sent by facsimile/e-mail followed by post to the successful Bidder, to the address given by him in the Bid document, soon after the decision of Ministry Procurement Committee.*

1.22 Awarding Criteria

1.22.1 *Subject to ITB Clauses 1.20 the CPC will award the contract to the successful Bidder, whose bid has been determined to be substantially responsive, lowest evaluated Bid, provided that the Bidder is determined to be qualified to perform the contract satisfactorily.*

1.22.2 *The successful Bidder will be called upon to Supply to CPC 01 No. 30,000 Litre Capacity, Low Profile, Semi Trailer, Aircraft Refueller conforming to Technical Specifications, and strictly by the agreed Shipment Schedule which shall be 09 months as per clause 2.6.3 of COC.*

1.22.3 *The successful Bidder will be called upon to enter into an Agreement with CPC. A specimen Form of Agreement is attached as Annexure- D.*

02. CONDITIONS OF CONTRACT (COC)

02. CONDITIONS OF CONTRACT (COC)

2.1 Performance Guarantee

The successful Bidder on being notified by CPC of the acceptance of his Bid, shall furnish at his own expense a Performance Guarantee, within fourteen (14) days of such notification issued by a recognized Commercial Bank in Sri Lanka or a Foreign Bank with the Guarantee confirmed by a recognized Commercial Bank operating in Sri Lanka, and approved by the Central Bank of Sri Lanka and payable to the CPC on demand in a sum equivalent to 10% of the total Free on Board (FOB) value of the accepted Bid. The Performance Guarantee shall be substantially in the format given in Annexure E.

If the successful Bidder fails to furnish the Performance Guarantee as aforesaid, his name will be placed in the list of defaulting Contractors.

The successful Bidder in the event of his failure to furnish the Performance Guarantee as required, shall be liable for any losses, costs, expenses and damages, which the CPC may sustain in consequence of such failure, and the Bid Security shall be forfeited.

The Letter of Credit will be opened only after the receipt of the Performance Guarantee. The Performance Guarantee shall be in favour of the CPC, and shall be valid for a period not less than Three Hundred and Sixty Five (365) days from the date of anticipated final delivery.

To expedite opening of Letter of Credit, the Supplier shall on his own account instruct his Bank to Fax CPC, the date, the amount and validity period of the Performance Guarantee. Simultaneously, the original document of the Performance Guarantee shall be sent to CPC by courier.

2.2 Pre-Shipment Inspection by Third Party & Witness by CPC Officials

2.2.1 The Aircraft Refueller should be subject to a pre-shipment inspection for quality, quantity, & marking requirement at the sole discretion of CPC by an internationally recognized Third Party Independent Inspector accepted by CPC. The minimum requirement to be included in the scope of work of the Third Party Inspector is defined in Annexure G. The cost involved for this inspection shall be included in the schedule of price. The quality and quantity determined by this Independent Inspector shall be binding on both parties.

Third Party Inspection Report should be sent to CPC by Courier and CPC in return will send the Letter of Acceptance back to the supplier within 10 days after receipt of CPC approval of the Third Party Inspection Report. Shipment shall be made only after receipt of CPC approval for the Third Party Inspection Report and the letter of acceptance issued by the CPC shall be submitted to the Bank with the Original Shipping Documents. These terms shall be included in the Letter of Credit as a condition.

2.2.2 In addition to Third Party Inspection as per Clause 2.2.1 the bidder shall allow two CPC Officials to Witness the Test and Perform Inspection prior to the shipment of Aircraft Refueller. The Bidder shall give Forty Five (45) days notice to CPC before Testing or Inspection with Seven (7) days confirmation notice. Complete module shall be Factory Tested by the Manufacturer prior to final Testing by CPC Officers.

2.2.3 The Bidder shall at his own cost, afford the two (2) officers all proper and reasonable facilities covering return air tickets, food and accommodation, travelling for examining, inspection and, testing the Aircraft Refueller and shall also supply free-of-charge such apparatus, materials tools, gauges, labour and assistance as may be required from time to time, for the purpose of such examinations, inspections & testing.

2.2.4 The prospective Bidder shall submit monthly progress reports during the execution of fabrication, pre commissioning, inspection and performance testing phases. Progress report shall be prepared which will be including the following items.

2.2.4.1. Bar chart schedule

2.2.4.2. Critical path schedule

2.2.4.3. List of activities achieved during the reporting period

2.2.4.4 .List of activities planned in the succeeding period

2.3 Technical Training for CPC Maintenance Staff

A Technically Competent Officer from the Manufacturer capable of providing Technical Training to CPC Technical staff shall visit CPC & conduct training on Operations, Maintenance & Troubleshooting procedures of the Refueller supplied. The duration of the training programme shall not be less than Two (02) days & all expenses covering travelling, accommodation, food and internal transport of the resource personnel shall be borne by the Bidder. Medium of training shall be in English Language.

The technical training aforesaid shall be conducted after two weeks period from the date of arrival of the Aircraft Refueller at the Port of Colombo.

2.4 Warranty Conditions

2.4.1 The successful Bidder shall provide manufacturer's warranty that the design, engineering & equipment/material supplied shall be free from defects & shall conform & shall perform so as to comply with specifications contained in the Bid document.

2.4.2 This Manufacturer's Warranty shall cover a minimum period of 12 months from the date of arrival of the Aircraft Refueller at the port of Colombo.

2.4.3 All such defects found within the Warranty Period aforesaid shall be rectified or replaced free of charge by the Supplier. Any defective component found during the warranty period shall be replaced within one week upon notification.

2.4.4 Repairs / Part replacements of the Chassis / prime mover supplied on this contract shall be carried out by the Accredited Local Agent of the Chassis / prime mover Manufacturer and he shall maintain a stock of spares & attend to any repair caused by manufacturing defects or inferior quality components during Warranty Period at Bandaranaike International Airport, Katunayake, or at their workshop at his own expense. Services for the Chassis / prime mover during the Warranty Period shall be carried out according to the Manufacturer's recommended schedule.

2.5 Mode of Payment

2.5.1 Foreign Cost

Payments shall be made by an irrevocable Letter of Credit, 90% of the FOB value at sight and balance 10% after the delivery and acceptance by CPC.

2.5.2 Agent's Commission

2.5.2.1 In Item No. 09 of the 'Schedule of Prices', the Bidder shall indicate the Local Agent's Commission (if any), in Sri Lanka Rupees.

2.5.2.2 Agency Commission shall be paid on receipt of a Certificate from the Operations Manager (Aviation) of CPC that the items have been received as per the terms and conditions of the contract.

2.6 Shipping documentation, Test Certificates, Approvals and Operating & Maintenance Manuals.

2.6.1 *Immediately after the Aircraft Refueller is shipped, the supplier shall send to CPC, a Fax/E-mail stating the name of the Vessel and the other relevant details. Also, within 03 days from the date of Bill of Lading, 04 copies of each of the following shipping documents shall be sent by Courier to CPC.*

2.6.1.1 *Clean on Board Freight prepaid/Collect Bill of Lading showing destination as Colombo and indicating actual amount of freight paid. If freight is not indicated on the Bill of Lading, freight receipt issued by the Shipping Company, indicating the freight shall be annexed.*

2.6.1.2 *Four copies of manually signed Commercial Invoices showing cost and freight separately.*

2.6.1.3 *The Certificate of Manufacturer, stating that the item shipped was manufactured by them and indicating the country of origin.*

2.6.2. *Following documents shall also be sent along with the shipment*

2.6.2.1 *One copy of Operation & Maintenance Manual containing, operating maintenance procedures, trouble shooting guide, flow charts for the functions/features and other relevant information and spare parts catalogue for Aircraft Refueller.*

2.6.2.2 *Workshop Manual and spare part catalogue covering all items in the Chassis / prime mover with sufficient references (Part Nos.) disassembly & maintenance procedures, and other relevant information shall be supplied.*

2.6.2.3 *Electrical wiring diagram. (Double Pole)*

2.6.3 Shipment Schedule

The “01 NO. 30,000 LITRE CAPACITY, LOW PROFILE, SEMITRAILER, AIRCRAFT REFUELLER” shall be shipped to CPC within a period of 09 months from the date of establishment of Letter of Credit

2.7 Defaults by Successful Bidder

2.7.1 If the successful Bidder, defaults in the supply or otherwise commits a breach of any of the provision in the Contract with CPC for the supply of 01 No. 30,000 Litre Capacity, Low Profile, Semi Trailer, Aircraft Refueller according to the Technical Specifications, he shall be liable to pay to CPC, all losses, damages and expenses incurred by CPC, in consequence of such default or breach.

2.7.2 Bidders shall declare that they had read the Bid conditions, and that they make the offer in compliance with, and subject to all the conditions thereof, and agree to perform the services in accordance with the said conditions in the manner therein set out, and in terms of this offer. A form of Bid as Annexure – “B” is attached.

2.8 Liquidated Damages

Shall the Supplier fail to Supply of 01 No. 30,000 Litre Capacity, Low Profile, Semi Trailer, Aircraft Refueller within the period specified or shall he fail to replace any defective components or a part thereof with a like quantity of approved quality within the period allowed, the Supplier shall be liable to pay as a pre-estimate of liquidated damages, the sum of 1/1000th of the F.O.B. value of the, 01 No. 30,000 Liter Capacity, Low Profile, Semi Trailer, Aircraft Refueller per day for delay in executing the order, until the order is completed subject to a maximum of 10% of total F.O.B. value of the order. The Supplier in these circumstances will also render himself liable to be placed in the list of defaulting suppliers and be precluded from having any concern in the Ceylon Petroleum Corporation Bids.

2.9 Patent Infringement

Supplier shall defend any and all infringement suits in which CPC is made a defendant, alleging patent infringement on equipment purchased from Supplier. Supplier shall pay all costs and expenses incident to any such litigation. It being further agreed and understood, that CPC shall have the right to be represented therein by counsel, of their own selection and paid by them. Supplier shall pay all damages profits and/or costs, which may be subjected under the patent rights.

2.10 Force Majeure

Except as regards an act of God, War, Strike, Invasion, Civil war, Rebellion, Revolution, Insurrection, Earthquake, Plagues or Tsunami, the Bidder shall undertake all risks and liabilities of whatsoever kind arising out of incidentals connected with the sale.

2.11 Arbitration

Arbitration arising out of this contract shall be conducted under the rules of the Arbitration Centre of the Institute of the Development of Commercial Law and Practice (ICLP) in Sri Lanka and in accordance with the Arbitration Act No. 11 of 1995 of Sri Lanka. The place of Arbitration shall be Colombo, Sri Lanka.

03. TECHNICAL SPECIFICATIONS

Specification of 30,000 Litre Capacity,
Low Profile, Semi Trailer,
Aircraft Refueller

This specification covers requirements for Construction of an 30,000 Litre Capacity, Low Profile, Semi Trailer, Aircraft Refueller on Diesel Powered suitable Chassis / prime mover, capable of Fuelling Jet Aircraft Under-Wing at Flow Rates up to 3000 litres/min. with a suction defueling capability up to 800 litres/minute from two deck hoses and, minimum 200 litres/minute from Over-Wing Refuelling facility.

The basic vehicle shall be configured with the main elevating Fuelling deck mounted on the Prime-Mover unit immediately to the rear of the Drivers Cab. The Hose Reels, Pumping, Metering and Filtration Equipment and Operation Panel shall be located on the Prime-Mover unit to the rear of the elevating Fuelling Deck.

3.1 General

This specification sets out the requirements for the design, construction and testing of the Low Profile Semi Trailer Aircraft Refueller. The vehicle is intended for use on private roads and airside areas at limited speeds. It is not intended for general transportation or delivery on public highways.

3.1.1 Standards and specifications

The following shall be the applicable standards for the respective equipment.

TABLE 1: APPLICABLE STANDARDS

Int'l/Euro/ German	British	USA	Subject (not necessary the full and proper title)
<i>DIN ISO 1185</i>	<i>BS AU 197</i>	<i>SAE J 560b</i>	<i>Electrical connections, 24V type 24N normal - 7 contact</i>
<i>DIN ISO 3731</i>	<i>BS AU 198</i>		<i>Electrical connections, 24V type 24S Supplementary -7 contact</i>
<i>DIN ISO 4009</i>	<i>BS AU 195a</i>		<i>Mounting of electrical connections on the rear cross members</i>
<i>DIN ISO 4141</i>		<i>SAE J1067</i>	<i>Seven conductor jacketed cable for truck/trailer connections</i>
<i>German GGVS</i>			<i>Electrical connection for vehicles, 13 contact</i>
<i>ISO 7638</i>			<i>Brake anti - lock device connector - truck to trailer</i>
<i>DIN ISO 1728</i>		<i>SAE J318</i>	<i>Pneumatic braking connections - Palm/Glad-hand type</i>
	<i>BS AU 138a</i>		<i>Contact type brake couplings</i>
<i>ISO 1728</i>	<i>BS AU 138a</i>		<i>Location of brake couplings on rear cross members</i>
<i>ISO 1102</i>	<i>BS AU 220</i>		<i>Dimensions of 50 mm drawbar couplings</i>
<i>ISO 3584</i>	<i>BS AU 166</i>		<i>Mounting of drawbar couplings on rear cross members</i>
		<i>SAE J697</i>	<i>Safety chain for full trailers or converter dollies</i>
<i>DIN ISO 7706</i>	<i>BS AU 215</i>		<i>Power take off's (PTO's) - Clearance envelope</i>

<i>Int'l /Euro/ German</i>	<i>British</i>	<i>USA</i>	<i>Subject (not necessary the full and proper title)</i>
<i>DIN ISO 7653</i>	<i>BS AU 203a</i>		<i>Dimensions of couplings between PTO's and ancillary units</i>
<i>ISO – various</i>	<i>BS AU 50</i>		<i>Vehicle tyres, loads, rims, wheels</i>
<i>ISO 2882/3</i>	<i>BS 2050</i>		<i>Elect. resistance-conductive/anti static products/inc. tyres</i>
<i>ISO 45</i>	<i>BS 3C 14</i>	<i>MS 24484</i>	<i>Adapter, Pressure Fuel Servicing, nominal 2.5 inch diameter</i>
		<i>MIL.A 25896</i>	<i>Adapter, Fuel, 2.5 inch diameter-includes strength tests.</i>
		<i>API RP 1004</i>	<i>Tank Vehicle Bottom loading and Unloading-4 inch Adapters</i>
<i>ISO 102</i>	<i>BS 2C 13</i>	<i>SAE AS 1852</i>	<i>Gravity/over-wing fuelling nozzles and ports</i>
		<i>API 1542</i>	<i>Airport Equipment Marking for Fuel Identification</i>
	<i>IP/ Filtration</i>	<i>API 1583</i>	<i>Aviation Fuel Filter Monitors with absorbent Type Elements</i>
<i>(pr)EN 1361</i>	<i>BS 3158</i>	<i>API 1529</i>	<i>Aviation fuelling hose and hose assemblies</i>
<i>VG 85 328</i>			<i>Hose couplings with clamps</i>
<i>VG 95 950</i>			<i>Hose couplings with Whitworth pipe threads (BSPP)</i>
<i>ECE/TRANS /110</i>			<i>European Agreement concerning the international carriage of dangerous goods by road (ADR)</i>
<i>(pr)EN 12312-5</i>			<i>Aircraft Ground Support Equipment- refuellers, Dispensers etc.</i>
		<i>NFPA 30</i>	<i>Flammable and Combustible Liquids Code/vent requirements</i>
		<i>NFPA 385</i>	<i>Tank Vehicles for Flammable and Combustible Liquids.</i>
		<i>NFPA 407</i>	<i>Aircraft Fuel Servicing</i>
	<i>BS 476</i>		<i>Fire tests - pt. 7 flame spread classification pts. 12/13 ignitability</i>
	<i>BS 5958</i>		<i>Control of undesirable static electricity</i>
	<i>BS 2915</i>	<i>ASME.VIII UG131</i>	<i>Vapour flow calculations - BS 2915 specific to Bursting discs.</i>
		<i>Mil.F. 38363</i>	<i>US Mil. Spec- Aircraft fuel systems, general</i>

		SAE.AS 1484A	Test procedure/limits of surge pressure - fuel dispensing system.
Int'l/Euro/ German	British	USA	Subject (not necessary the full and proper title)
		<i>Various SAE-AE-5C Documents In Preparation</i>	<i>Surge pressure generation and measurements</i>
			<i>Glossary of terms – Aircraft fuelling</i>
			<i>Commercial nozzle specification</i>
			<i>Guidelines for procurement of fuelling vehicles Adapter wear limits.</i>
DIN 28459		<i>Similar in TTMA and NTT specs</i>	<i>Flanges for 'Tank wagon'- connecting flanges</i>
DIN 28460			<i>Flanges for 'Tank wagon' - welded, for aluminium pipe</i>
DIN 28461			<i>Flanges for 'Tank wagon'-welded, for steel pipe</i>
DIN 28462			<i>Flanges for 'Tank wagon'-threaded flanges for couplings</i>
DIN 28463			<i>Flanges for 'Tank wagon' - gaskets</i>
		ANSI B.16.5	<i>Steel pipe flanges and fittings</i>
	BS 1560		<i>Steel pipe flanges and flanged fittings</i>
DIN ISO 228/1	BS 2779	JIS B0202 p'll	<i>Pipe threads- tubes and fittings- fastening/non thread seal type</i>
DIN 2999, ISO.7/1	BS.21	JIS.B0203 tpr	<i>Pipe threads - tubes and fittings - thread seal type / tapered</i>
	BS 4677		<i>Arc welding of austenitic stainless steel pipe</i>
BS EN 485/515/573	BS 1470/1/ 2/3/4/5		<i>Aluminium and aluminium alloys, tube, forging, sheet, plate</i>
	BS 6363		<i>Welded cold formed steel structural hollow section</i>
	BS 5323		<i>Code of Practice for scissor lifts</i>
	BS 7171		<i>Mobile elevating work platform</i>
	BS 5395		<i>Stairs, ladders and walkways</i>

Int'l/Euro/ German	British	USA	Subject (not necessary the full and proper title)
	<i>BS 4592 pt.1</i>		<i>Open bar/mesh gratings and panels</i>
	<i>BS.4592 pt.2</i>		<i>Expanded metal gratings and panels</i>
<i>BS EN ISO 8503 ISO 8502/4 ISO 11124/5/6/7</i>	<i>BS 7079</i>		<i>Preparation of steel substrates before application of paint -Blast cleaning etc.</i>
	<i>BS 308 series</i>		<i>Engineering drawing</i>
<i>IEC 617-4</i>	<i>BS 3939</i>		<i>Graphic symbols and diagrams for electrical power circuits</i>
<i>BS EN 60598 IEC 598</i>	<i>BS 4533</i>		<i>Luminaries</i>
	<i>BS 5308</i>		<i>Instrumentation cables</i>
	<i>BS 6862 Pt.1</i>		<i>Cables with copper conductors for vehicles</i>
	<i>BS 2950</i>		<i>Cartridge fuse links for telecomm's and light electrical apparatus.</i>
	<i>IP/Electrica l</i>		<i>Electrical Safety Code. pt.1 of the Model Code of Safe Practice</i>
<i>IEC 529</i>	<i>BS 5490(obs)</i>		<i>Classification of degrees of protection provided by enclosures</i>
<i>BS EN 60947 IEC 144</i>			<i>Degrees of protection of enclosures/low voltage switch gear and control gear</i>
	<i>BS 5435</i>		<i>Selection, installation and maintenance of electrical apparatus for use in potentially explosive atmospheres</i>
<i>DIN EN 50 0srs IEC 79 series VDE 0170series</i>	<i>BS 5501 Series</i>	<i>USA UL698</i>	<i>Electrical apparatus for potentially explosive atmospheres</i>
<i>IEC 79-15</i>	<i>BS 6941</i>		<i>Specification for electrical apparatus for explosive atmospheres with type of protection N (Zone 2)</i>
<i>IEC 34 Pt.5 EN 60 034 Pt5</i>	<i>BS 4999 BS 5000</i>		<i>Rotating electric machines</i>
<i>ISO 4148 ECE 65 / *</i>		<i>SAE J1318</i>	<i>Flashing beacons- *Also EEC Automotive Directive 72/245 for EMC (Electro- magnetic compatibility)</i>
<i>*</i>		<i>SAE J994</i>	<i>Audible alarms - *Also EEC Directive 91/368-supply of Machinery (safety) Regulations, clauses 3.2.1 and 3.6.1</i>

3.2 Chassis / prime mover and Related Details

3.2.1 Refueller

3.2.1.1 General

3.2.1.1.1 *The chassis / prime mover must be capable of towing, when fully laden, a full semi trailer having a capacity of 30,000 litres of Jet A-1. Number of axles for the trailer shall be decided by the refueller manufacturer.*

The trailer shall be of chassis / prime mover less construction, which complies with the International instructions pertaining to quality control protection and aircraft refuelling service.

3.2.1.1.2 *The chassis / prime mover shall be purchased by the aircraft refueller manufacturer and it shall be equipped with following typical requirements as appropriate.*

TABLE 2: BASIC FEATURES

<i>Model</i>	<i>4x2 day cab with rear windows, right hand drive.</i>
<i>GVW</i>	<i>Shall be capable of carrying the payload capacity of 26,500 kg.</i>
<i>Engine</i>	<i>4 strokes, direct injection, naturally aspirated/turbocharged, water cooled, diesel engine. (refer fuel specification given below)</i>
<i>Turning circle diameter</i>	<i>21 meters - minimum possible.</i>
<i>Gear box</i>	<i>Six speeds standard, with PTO, manual, fully synchronised.</i>
<i>Axle</i>	<i>Total axle loading capacity shall be more than the GVW.</i>
<i>Wheel base</i>	<i>Minimum wheel base shall be 6000 mm. Distance between the front end of the refueller tank and rear of the cab shall be minimum 4500 mm.</i>

Specification of Diesel Fuel available in Sri Lanka

LANKA SUPER DIESEL OIL (P – 016)

Property/Test	Test Method		Specifications
	IP	ASTM-D	
Appearance			Clear and visually free from water and impurities
Density @ 15° C kg/m ³	160	1298, 4052	820 - 860
Colour ASTM	196	1500	Report
Marketing Colour			Amber
<u>DISTILLATION</u>			
IBP, ° C	123	86	Report
10% Vol. Evaporated at ° C			Report
50% Vol. Evaporated at ° C			Report
90% Vol. Evaporated at ° C			Max. 370 (with effect from 01.01.2004)
Recovery at 315° C			Min 50%
Recovery at 350° C			Min 80%
Cetane Index		976	Min. 46 (see note-1 below)
Cetane No.	21	613	Min. 49
Cloud Point, ° C (° F)		2500	Max. 15.5 (Max. 60)
CFPP ° C (° F)	309		Max. 10 (Max. 50)
Sulphur Content % w/w		4294, 2622	Max. 0.25 (with effect from 01.07.2003) Max. 0.05 (with effect from 01.01.2004)
Flash Point PM CC, ° C (° F)	34	93	Min 60 (Min. 140)
Viscosity Kin @ 37.8° C, cSt	71	445	1.5 – 5.0
Water content % (v/v)	74	95	Max. 0.05
Cu Strip corrosion 3 hrs. @ 50° C	154	130	Max. 1
Ash % (w/w)	4	482	Max. 0.02
Carbon Residue, Ramsbottom On 10% residue % w/w	14	524	Max. 0.3
Water content % v/v	74	95	Max. 0.05%
Sediment by extraction % w/w	53	473	Max. 0.01
Total Acid No. KOH mg/g	1	974	Max 0.2
Strong Acid No. KOH mg/g	1	974	Nil
Calorific Value Gross, Kcal/kg.	12	240	Min 10,500

The bidder shall confirm that the engine of the Aircraft Refueller offered complies with the fuel specification aforesaid.

3.2.1.1.3 *Before supply, the chassis / prime mover manufacturer shall ensure that all the required optional fitments have been included correctly. A repeat check shall be performed by the Aircraft refueller manufacturer when the chassis / prime mover is received at his works.*

3.2.1.2 Weights, Distribution, Stability

3.2.1.2.1 *The GCW of the vehicle shall be capable for the payload capacity of 26,500 kg on the trailer.*

3.2.1.2.2 *The height of centre of gravity of the fully loaded vehicle shall not be greater than 95% of the distance between the outer ground contact/ track width of the tyres.*

3.2.1.3 Performance - Speed, Power, Tractive Effort and Distance

3.2.1.3.1 *For normal Aircraft refuelling services, the refueller to travel up to the maximum speed of 30 km/h. This will be comprised of many 'cold starts, very short journeys, mostly static engine operations and tight turns over level / coarse concrete surfaces.*

3.2.1.3.2 *When considering chassis / prime mover selection, it must be ensured that the maximum torque applied by the PTO gear unit output drive shaft to the pump does not exceed the rated capacity of the fuel pump gear box. (Hydraulic pump gear box for hydraulically driven fuel pump)*

3.3. Chassis / prime mover - Features

3.3.1. Engine / Mechanical

Basic Chassis / prime mover Features

3.3.1.1. *The diesel engine is to be sized to meet performance requirements in marginal 3.2.1.3 and shall develop a minimum of 275 hp at rated rpm.*

The engine exhaust manifold, radiator and thermostat shall be suitable for stationary engine operations in tropical climates, driving a P.T.O pump and auxiliary power unit.

A standard electric starter and air compressor shall be fitted.

3.3.1.2 *The transmission and any modifications must be suitable for the service specified via a manual gearbox.*

3.3.1.3 *Electrical current is to be supplied by a heavy duty alternator and rectifier to heavy duty/high capacity batteries, suitable for the tropical climate. Selection*

shall take into account that although the engine will be kept running during fuelling, overall journey times will be short.

- 3.3.1.4 *The exhaust is to be routed forward of the front axle with discharge on the opposite side to the operating station.*
- 3.3.1.5 *The opening of the air induction system shall be routed outside the cab (Snorkel) and face in the forward direction.*
- 3.3.1.6 *The cab shall be full forward with forward tilting.*
- 3.3.1.7 *Leaf springs selected for the chassis / prime mover must be suitable for the applied loads.*
- 3.3.1.8 *Power steering with a reasonable degree of 'feel' shall be fitted.*
- 3.3.1.9 *The wheel base of the chassis / prime mover shall be selected so that the semi trailer tank and equipment can be arranged without exceeding the permitted load for front and rear axles, so that the chassis / prime mover frame remains substantially horizontal, and so that the tank minimum bottom is maintained whatever the load.*
- 3.3.1.10 *The braking system shall be the dual circuit type meeting all EC requirements. The semi trailer brake connections, including hand control air valves if necessary, shall be the Palm or Glad-hand type coupling ISO. 1728/SAE.J318 Standard. 'Contact' or 'plug in' type couplings meeting BS.AU.138a (BS.AU.5 is for vacuum systems) may be used in place of palm type couplings. Brake action is to be spring loaded on, air pressure off. Pneumatic Couplings shall be positioned in accordance with ISO.1728/BS.AU.138a*
- 3.3.1.11 *Electrical requirements are described separately in item 3.3.2. When possible, it is better that equipment normally fitted by the chassis / prime mover manufacturer is suitable and retained for further use. However, the aircraft refueller manufacturer will need to carry out double pole rewiring and other modifications.*
- 3.3.1.12 *Dual large rectangular rear view mirrors are required (convex type) extended as necessary to provide a clear / unobstructed view along the side of the vehicle / tank, even in the maximum turning position. In addition, there shall be a mirror on the passenger side, positioned so that the driver can see to ground level beneath the door and front of the cab.*
- 3.3.1.13 *No cigar lighter or ash tray is to be fitted. However, if the chassis / prime mover is normally provided with a cigar lighter socket, then the electrical supply shall be disconnected and insulated.*
- 3.3.1.14 *Adequate ventilation is required for use in hot climates. No cab heater or air conditioning is to be fitted. However, a blower fan is required.*

- 3.3.1.15 *Front and rear directional signals, normal hazard flasher warning, reverse and brake lighting are required.*
- 3.3.1.16 *In addition to normal panel / dashboard instruments, an engine revolution counter and low air pressure indicator are required.*
- 3.3.1.17 *To prevent fuel or fuel vapour from contacting hot parts of the engine or exhaust , a metal fire screen is to be fitted, extending from the back of the cab, over most of its width, to the top of the chassis / prime mover and below on each side to 400 mm above ground level. To allow the cab to tilt forward, the fire screen shall be in two parts. One section attached to the back of the cab extending almost the whole of its width, and this overlaps, by 50 mm minimum, measured as a vertical dimension, another section attached to the chassis / prime mover frame.*
- The gap between the two parts shall be as small as practicable but in any case not more than $\frac{1}{4}$ of the vertical overlap.*
- As necessary additional screening shall be attached to the front wheel mud flaps or the side of the chassis / prime mover frame to the screen exhaust pipes.*
- 3.3.1.18 *If windows do exist in the rear cab wall, preferably they shall be removed and replaced with metal panels.*
- 3.3.1.19 *A robust channel bumper shall be fitted at the rear of the aircraft refueller.*
- 3.3.1.20 *A system must be provided to stop the engine from both the platform and the pumping control station. Controls shall be the push button/lock off type, requiring a special action to reset them.*
- 3.3.1.21 *Rear mudguards and mud flaps shall be provided.*

3.3.2 Electrical requirements

Standards and specifications

- 3.3.2.1. *All electrical requirements shall comply with particular BS, EN and IEC standards.*

Miscellaneous items

- 3.3.2.2. *An intermittent audible alarm is to be installed set to operate when the platform descends.*
- 3.3.2.3. *Lighting (with glass lenses) is required to illuminate the meter counters and all gauges and controls and VCFS at the operating station plus platform and access ladders. These lamps may be controlled either locally, from the vehicle cab, or near the operating station by a separate switch.*

- 3.3.2.4. *An adjustable platform light shall be fitted to illuminate the aircraft panel. It shall not be of such high intensity that it causes a dazzling effect but of sufficient brightness to enable, by adjusting its position, to give adequate illumination.*
- 3.3.2.5 *Aircraft / obstruction / marker warning lights shall be fitted, 2 at the front of the cab, 2 at rear of tank. These shall be in amber colour. A large flashing beacon is required, centrally placed on top of the cab roof.*
- 3.3.2.6 *Where applicable, all electrical connections shall be fitted with heat shrink insulation sleeves, and well fitted boots as a minimum standard.*
- 3.3.2.7 *All cables and electrical connections to be labelled and colour coded (with matching details in the operating / maintenance manual).*
- 3.3.2.8 *Any modifications or repairs to electrical circuits or equipment on vehicles shall be to recognised manufacturer's standards or equivalent.*
- 3.3.2.9 *As a reversing aid, buzzer or voice type to warn other personnel when reverse gear is selected, shall be provided.*

General Design

The electrical system shall be designed and installed to minimise the risk of sparking and electrical fires.

- 3.3.2.10 *There shall be electrical continuity between the chassis / prime mover, tanks and sub frames, fuelling cabinet and all fuelling components. Electrical resistance shall not exceed 10 ohms.*

The tank shall be bonded to the chassis / prime mover by means of a substantial braided copper strap.

- 3.3.2.11 *The nominal system voltage on the circuit shall not exceed 24 volts and the equipment shall be suitable for the appropriate zone as defined in British Standard 5345 for a Class II (2) product.*

*Jet A-1 fuel is covered by the category of **Gas Group IIA**,*

Temperature Classification T3

Zone 0 Within the main tank or product recovery / sample recovery tank.

Zone 1 Within an area between the ground and a point 300 mm above and on each side of any discharge opening or vent on top of the tank.

*Zone 2 Within an area between the ground and a point
1000 mm above and on each side of any discharge opening,
vent or sealed (gasket / O ring) joint.*

3.3.2.12 Behind the rear of the driver's cab all wire conductors shall conform to BS.6862 or equivalent to ensure that they are adequately insulated and able to carry more than the designed circuit current without causing an unsafe rise in wire temperature.

The conductors shall also be adequately fixed and protected so as to minimise the risk of damage or deterioration. Plastic flexible conduit is acceptable providing it is resistant to degradation by UV light. Where metal conduit is used for added protection and durability in particular location, then it must be corrosion resistant.

Conduit must not be routed where it might provide a tempting hand hold or be easily stood upon. All terminals including battery terminals shall be effectively protected and insulated by a cover against inadvertent contact and spillage of flammable liquids. All electrical enclosures to be to IEC .144/BS.EN.60947(was BS.5420) / IP65 Standards.

3.3.2.13 Behind the rear of the driver's cab:-

-No screw-in or cap-less bulbs shall be used.

Junction box, connectors and all electrical equipment shall be adequately protected and shielded as far as practicable from the ingress of moisture or dangerous substances under normal conditions of use.

3.3.2.14 An insulated return circuit must be used (double pole wiring), and shall not have more than 300 milliamps leakage between either polarity circuit or the vehicle chassis / prime mover.

3.3.2.15 A double-pole master switch to zone 2 requirements, as defined in BS.5345, to enable all electrical circuits to be isolated (including open circuiting of the generator field windings) shall be placed as near as possible to the battery and extra remote battery isolation switch shall be provided inside the cab.

This shall not prevent intrinsically safe or flameproof circuits, as defined in BS.5345 requirements, from being taken from the battery side of the master switch. The master switch control shall be readily accessible to persons outside the vehicle and its location shall be indicated by a clearly visible notice with an indication to when it is in the "ON" position.

Circuit protection

The following steps shall also be taken to ensure protection of the electrical circuits -

- 3.3.2.16 *All circuits, with the exception of the main battery supply and the starter and generator circuits shall be protected with fuses or circuit breakers in the feed side of each circuit.*
- 3.3.2.17 *Exposed fuse wire or links shall be avoided, but if used shall be fitted within a sealed unit.*
- 3.3.2.18 *All circuit protection devices with the exception of any barrier device for a tachometer or other intrinsically safe device shall be mounted forward of the cab rear wall.*
- 3.3.3 *Brake interlocks : Electrical Switches acting over pneumatic operation***
- 3.3.3.1 *Any pneumatic circuit for control or ancillary operation must include an auxiliary air reservoir and circuit, quite separate from the vehicle braking system, and supplied through a pressure regulating valve from the main braking system.*
- 3.3.3.2 *A brake interlock system, with switches in series, is to be fitted, so that when any of the fuelling nozzles is not secure in its holder or the platform is not in the fully down position, or a hose is connected to the loading adapter, or a power take off is selected, then the vehicle brakes will be applied, (either main system or parking brake system).*
- 3.3.3.3. *A separate warning light shall be provided to clearly indicate when the PTO is engaged. It shall not be possible to drive the vehicle with the PTO engaged.*
- 3.3.3.4 *In the event that an interlock is inadvertently activated and the brakes applied while the vehicle is moving, the application shall be slow enough to bring the vehicle to a controlled halt without endangering the driver or passengers.*
- 3.3.3.5 *Whether the interlock switches are electrical reed switch / magnetic proximity type, the system shall be designed to exhaust air from the vehicle brake actuating pilot.
Systems which require a positive air pressure signal to cause the vehicle brakes to be applied shall not be used.*
- 3.3.3.6 *The use of shuttle, check or non-return valves shall be minimised.*
- 3.3.3.7 *All switches and related devices shall be designed, arranged and protected to withstand external fuel contact and environmental conditions - bright sunlight / high and low humidity / dust and wind blown sand / rain etc.*
- 3.3.3.8 *The brake interlock switch system fitted must respond to*
(I) A Jet A-1 selective spout, and
(II) The presence of the nozzle body for over-wing fuelling system.
(III) In presence of non Selective spout (Separate Holder for ZRS 32)

3.3.3.9 *An emergency override pneumatic switch shall be fitted in the vehicle cab to allow the vehicle to be driven even if an interlock is operating to apply the brakes. This override switch is to be clearly marked and wire sealed in the position where it is non operative.*

The override switch system shall be arranged to by-pass and isolate the interlock switches (and in the case of electrical switches, the solenoid operated pilot valve) and act directly to apply pressure to the pilot valve controlling air supply to the chassis / prime mover and trailer spring brake actuators.

3.3.3.10 *Four large (50 mm min. dia.) warning lights, protruding 30 to 40 mm. shall be provided in the cab in a prominent position, with shielding as necessary from bright sunlight.*

- *One flashing red, to indicate that the override system is in operation.*
- *One flashing amber, to indicate if any interlock has been operated (Equipment not stowed)*
- *One continuous amber to indicate that pump drive is fully engaged.*
- *One continuous amber to indicate that road drive is fully engaged.*

Small pneumatic 'blinking eye' type indicators shall not be used.

The colour green must not be used for indicating that the P.T.O pump is in the drive position since it might be understood to indicate that it is safe to drive the vehicle away from an aircraft, even though the interlock warning light is flashing.

3.3.3.11 *Signals for indicating the pump gearbox engagement position can be taken from switches or sensors actuated by a device attached to the exposed selector shaft - monitoring selection by the presence or absence of air pressure to the gearbox is not sufficient to give clear indication of engagement / disengagement.*

3.3.3.12 *Provision shall be made for automatically operating both the trailer and the cab braking system if an interlock on the trailer has been actuated (e.g.: bottom loading coupling still connected).*

Trailer brakes must not be able to act independently of the chassis / prime mover brakes except when the units are separated and air is exhausted for parking purposes.

The arrangement would be such that a positive air signal from the trailer would cause the chassis / prime mover brakes to be applied. In this case, absence of an air signal would allow the chassis / prime mover system to operate normally.

The trailer interlock connection on the chassis / prime mover shall be a $\frac{1}{4}$ inch BSPPF (R $\frac{1}{4}$ female/mutter) plugged bulkhead fitting located on the right hand side rear.

Chapter 4:- Functionality and Construction

4.1 Flow performance

The operating capacities noted below must be sustainable for periods long enough to enable the complete contents of the fueller to be delivered or received (during defuelling or self loading) without any components being over rated or overheated.

4.1.1 Fuelling

Under mentioned deck hose and reel hose flow rates shall be achieved when the secondary pressure control valve is set to provide maximum 65 psi (air reference pressure shall be 65 psi + spring bias) meanwhile the pressure downstream of the nozzle/aircraft adapter is 2 bars:-

Also the same flow rates shall be achieved within the most economical engine RPM range (operation)

- a) 2 deck hoses - 3000 l/m total
- b) 1 deck hose - 1800 l/m
- c) 2 reel hoses - 2400 l/m total
- d) 1 reel hose - 1100 l/m via 30m x 2 1/2 inch

Pressure losses between the pump outlet and hose inlet (s) shall be minimised and shall take into account a potential pressure loss across the filter monitor of 1.5 bar at maximum rated flow.

Over-wing fuelling facility:

One over-wing hose reel – 200 l/min minimum discharge rate via 20 meters of 1.5 inch diameter hose.

4.1.2 Defuelling

In this mode, fuel will pass through the meter (counting in the reverse direction) and into the fueller via the normal bottom loading system.

Required performance is: - 1 reel hose - 400 l/m, 2 reel hoses -800 l/m

The flow rate is to be achieved with the engine at idle speed, increased automatically above normal by pump engagement and, if necessary, by using RQV governor.

4.2 Dimensions – Aircraft Refueller

Width: 3000mm Maximum

Length: 16000mm Maximum

Height of completed vehicle with dead stock

Chassis / prime mover cab height (with flash beacon): 2850 mm maximum

Notes:-

- *The heights specified are based on IATA recommendations for minimum clearance of 250 mm between the vehicle and potential collision points under the aircraft wing. The minimum would apply when the aircraft is fully loaded to the maximum permitted weight including a full fuel load, at critical centre of gravity, with tyres and oleos in the normal serviced condition, and the fueller empty except for dead stock.*

- *The length is based on what has been possible to achieve in practice with a reasonably sized platform.*

- *The width of 3000mm This is simply a practical limit from the viewpoints of maximising capacity, construction, shipment, airport manoeuvrability and when necessary, driving empty on public roads to maintenance facilities. The latter would, in any case, normally require authorisation and / or escort from highway policing authorities.*

4.3 Transverse Weight Distribution

Aspects of longitudinal weight distribution are covered in items 3.2.1.2.1, 3.3.1.9 and 5.1.1.4 Transverse weight distribution must be arranged such that the vehicle remains substantially horizontal under all loading conditions.

4.4 Equipment and functions

4.4.1 General information

4.4.1.1 Where a fuelling component is not specified by name, the constructor is required to propose a suitable item. Where a component is specified 'typical' or 'equal' is stated, the constructor shall submit details of an alternative item.

4.4.1.2 The meter, all pumping controls and the system instruments are to be located close together at an "operating station" on the driver's side of the aircraft refueller.

4.4.1.3 The movement of only one control shall be required to convert from fuel to defuel operation or vice versa.

4.4.1.4 The fuelling equipment shall be laid out in a compact neat and tidy manner so as to give an overall streamlined appearance to the aircraft refueller.

- 4.4.1.5 *All hose reels, meters and controls must be so arranged and shall be totally enclosed in a cabinet.*
- 4.4.1.6 *All hydraulic power for the platform and hose reels is to be derived from engine driven components, not electrical batteries.*
- 4.4.1.7 *There shall be a minimum clearance of 400 mm, when loaded, between the ground and vulnerable fittings such as sample point and drain line outlets. This distance allows easy access for bucket, sample jar or small bore hose connection. However, sample points shall not be too high off the ground otherwise excessive splashing and spillage could occur.*
- 4.4.1.8 *Only square or rectangular corrosion resistant tubing is to be used for vertical or horizontal members of the panel and top deck. Finished appearance of the unit must be good and angled section bar supports are not acceptable if they are visible, except where used for securing fuelling components. All steel sub-assembly components must grit blasted and prime coated before attachment.*
- 4.4.1.9 *The design and position of equipment shall minimise corrosion. Surface preparation and coating shall be of the highest standard with water traps avoided. All small fastenings shall be of non corrosive materials.*
- 4.4.1.10 *All welding shall be continuous where practical. Where stitch welding on exterior components is used, epoxy sealant shall be applied to un-welded areas to prevent water entrapment. All welding must achieve full penetration and any weld splatter must be removed.*
- 4.4.1.11 *All pop rivets shall be stainless steel or aluminium with high magnesium alloy (5%) material composition to British Standard 1473 Al Mg5 or similar.*
- 4.4.1.12 *The material or finish of fuel sense lines shall differ from that of pneumatic lines for ease of identification.*
- 4.4.1.13 *Tamper proof covers or locking devices are required on the following controls to prevent inadvertent alteration :-*
- *the hydraulic flow divider (if fitted)*
 - *the air sense pressure regulator*
 - *hydraulic hose reel rewind speed controls*
 - *platform speed controls*

4.4.2. Functions

- 4.4.2.1 *The design of the system ensures that when fuelling, product cannot by-pass the filter or be circulated or returned to storage from downstream of the*

meter. Interlocked systems, which are intended to achieve this, are not acceptable. - i.e. the meter must be downstream of all other branches connected back to the tank or pump inlet.

No pressurised transfer or delivery pipe work is permitted inside the tank.

- 4.4.2.2 A combined bottom loading / outlet valve is not used. Use of a single valve does not permit re-circulation for purposes such as hose / system flushing or fuel drying. The short length of common line would also contain fuel, which had not been in the tank for settling or checking. For defuelled product, all these aspects are particularly relevant.*
- 4.4.2.3 All products entering the tank goes through the bottom loading system (The bottom loading valve shall be off-loading lever operated type or pneumatically operated type) and hence is subject to the high level shut off control system.*
- 4.4.2.4. A non return / check valve is positioned downstream of the pump / filter to prevent reverse flow in the fuelling mode of operation.*
- 4.4.2.5 When defuelling, no product can be recorded as being defuelled which has not been removed from the aircraft. Potentially contaminated bacteria laden product does not pass through the filter monitor, which is additionally protected from possible contamination by a closed valve on the inlet side. The deadman valve may be used for this purpose depending on equipment arrangement.*
- 4.4.2.6 During pressurised defuelling, when the aircraft pumps are operating and if the fuel / defuel control is in the fuelling position, thus allowing the deadman valve to be opened, the non return valve also prevents product from being passed backwards through the filter, thus causing element damage, and into the tank via the foot valve, the tank being unprotected by the high level shut off system.*
- 4.4.2.7 In the defuel mode, it shall not be possible for the operator to increase pump speed using the control lever. This can be achieved by arranging for air pressure to be applied to the air cylinder installed to automatically reduce engine speed to idle when the deadman valve handle is released.*
- 4.4.2.8 There is an isolating valve in the return line between pump outlet and the tank, automatically open for defuel and closed for fuelling. This prevents high pump pressure from being imposed on the bottom loading couplings in the reverse direction and on the bottom loading valve.*
- 4.4.2.9 There is a non return valve in the defuel line between the pump and connection to the bottom loading system. This ensures that all product entering the fueller passes into the tank, even if the isolating valve is open (control lever in 'defuel') or has failed.*

In addition, if the control lever is in the 'defuel' position, the non return valve prevents fuel being pumped from elsewhere into the bottom loading couplings,

through the defuel return line, backwards through the pump, backwards through the line by-passing the filter and hence into aircraft.

4.4.2.10 *The system provides an ability to draw from an outside fuel source so that the fueller can normally be arranged via the deadman valve, filter monitor, delivery hose system to aircraft.*

4.4.2.11 *When Fuelling from the outside suction point using the on-board pump, the fueller 'foot valve' lever controls will need to be closed, and the 'fuel / defuel' selector will be in the 'fuel' position.*

Note:- In general, it is not recommended that a pressurised source of product be connected to the outside suction point of a fueller (A), e.g. from a second fueller (B), since there is a risk that the tanks of fueller (A) could be reverse filled via their respective foot valves without the safety benefit offered by the high level automatic shut off system.

4.4.3. Instrument panel / control station

The following instruments and controls are required and are to be neatly located at the pumping control station. Minimum length of the instrument control panel (instrument cabinet as mentioned in 4.4.1.5) shall be 2000mm.

- 4.4.3.1
- *Pump speed control lever (below panel, not illustrated). A movement limit stop shall be fitted and adjusted to prevent over speeding the pump. Item 4.4.5 gives more information.*
 - *Engine RPM indicator or pump RPM indicator (mechanical drive type). A red line is to be marked on the gauge face at the maximum speed recommended for pump operation (or affix an adjacent label).*
 - *Hydraulic oil pressure gauge.*
 - *Pump vacuum gauge, 100 mm, glycerine damped, calibrated in inches of mercury.*
 - *Pump discharge pressure gauge, 100 mm, glycerine damped. Maximum range shall be approximately zero to 200 lbf/in²/14 bar.*
 - *Filter monitor differential pressure gauge, direct reading piston type 0-30 lbf/in², with low pressure side drain test and isolating valves and drain line to be extended up to slope tank. Also see item 4.5.9. concerning tubing and fittings.*
 - *Fuel sense point (venturi) pressure gauge, 100 mm, glycerine damped, for the secondary pressure control. The range shall be approximately zero to 150 lbf/in²/10 bar.*
 - *Air reference pressure gauge for the SPCV, 100 mm, range zero to approximately 150 lbf/in² / 10 bars.*

Note:- Gauges are to be dual calibration (bar and lbf/in²).

- *Quick disconnect fittings (male and female halves) with isolating valves to permit the pump discharge, sense point (Venturi), and air reference pressure gauges to be tested in situ.*
- *Air pressure regulator (on or easily accessible just behind the panel) for setting the secondary pressure control valve. The regulator must be stable and of the self relieving, rapid response type. It shall be capable of handling the volume of air displaced by the secondary pressure control valve when caused to close by increasing downstream fuel pressure.*
- *De-pressurising control. (Manual)*
- *Fuel / defuel selector lever control (or adjacent push / pull type with indicator).*
- *Outlet / foot valve control (with emergency trip on the other side of the aircraft refueller).*
- *Push and lock type engine stop control (with another on the platform).*

4.4.4 Labels and signs

4.4.4.1 All gauges, controls, switches and warning lights are to be labelled using engraved laminate or similar plastic UV light resistant material not embossed Dymotape - suitably inscribed to give white letters on a contrasting background, or vice versa.

Notwithstanding the above, items whose functions are very obvious do not need to be so identified. Excessive labelling / identification shall be avoided where it results in overcrowding or potential confusion.

4.4.4.2 Thin, self adhesive labelling or painting (except on the tank or cab) is not acceptable. Labels inside the cab may be bonded in position but those outside the cab shall be affixed using rivets. Care shall be taken to ensure that labels are aligned correctly / not askew and located adjacent to the item or control to which they apply.

4.4.4.3 The SPCV 'fuel sense pressure' gauge shall be labelled as such. If a venturi pressure control system is fitted, the gauge shall be labelled 'venturi pressure' - not 'fuelling pressure' or 'nozzle pressure'.

4.4.4.4 A fuelling circuit and operating instruction plate shall be affixed near the control station.

4.4.4.5 Warning labels shall be attached under the platform advising "Do not work under lift without safety stays/locks in place".

4.4.4.6 *An instruction plate shall be attached near the pump selector on the dashboard giving clear instructions for:-*

- *Minimum air pressure requirement*
- *Engaging pump drive*
- *Disengaging pump drive*

4.4.4.7 *Labels for tyre inflation pressure shall be affixed to the wheel arches / mudguards.*

4.4.4.8 *Filter monitor sample points are to be clearly marked - Filter Inlet Filter Outlet.*

4.4.4.9 *Jet A-1 grade stickers (API.1542) shall be fixed to sides, front and rear of vehicle. "No smoking" signs are to be attached to the doors of the cab (International Symbol).*

4.4.4.10 *The language used for labels and signs shall be English.*

4.4.5 Pump controls

4.4.5.1 *Pump engagement and dis-engagement shall be controlled from the vehicle cab, the control lever and air pressure gauge being adjacent to the normal gear selector.*

Selection of pump drive shall automatically increase engine idling speed to prevent gearbox chatter.

4.4.5.2 *A manually adjustable, lever type engine speed control (non pneumatic) is required at the pumping control station, complete with quick release action. An automatic control linked to the deadman operation is also required to return the engine to the idle position when the deadman valve is closed. Subsequent operation of the deadman shall not cause the engine to automatically increase above idling speed.*

4.4.5.3 *Also see:*

Items 3.3.3.10 and 3.3.3.11 concerning warning lights

Items 3.3.3.2 concerning interlocks

Item 4.4.2.7 concerning de-activation of the speed control during defuelling

Item 4.4.4.6 concerning labelling / instructions

4.4.6 Outside suction / self loading

4.4.6.1 *The outside suction point shall comprise a 3 inch ball valve and 2 ½ inch aircraft adapter type tank unit with ANSI 150 flange complete with dust / sealing cap. Outside suction point shall be upstream of isolation valve.*

4.4.7 Pressure control / deadman

4.4.7.1 *Pressure control is to be provided both by hose end (primary) pressure control valves (HEPCV's) and by a direct line mounted, non bypass, secondary pressure control valve (SPCV). The latter will also act as a deadman valve, it shall be remote sensed.*

4.4.7.2 *Sense line valve shall be sealed in the open position.*

4.4.7.3 *The system may include one or more venturis to compensate for downstream pressure loss. In this case, the venturi sense lines shall be connected together via 'leaky non return valve' for selection purposes. Solenoid or pilot operated selection shall not be used. In this case, the venturi system shall not allow the pressure downstream of a blocked open HEPCV to exceed 55 lbf/in² from maximum to low flow rate, with shut off pressure being 65 lbf/in² maximum.*

4.4.7.4 *The standard method of deadman control shall be an electric over air system using a Suzy (Suzie) cable connection rather than a reel. Single line air bleed systems shall be avoided since in general, they introduce reaction time delays and are difficult to adjust correctly.*

Spring loaded push button type deadman override which requires constant pressure on the button to maintain fuel flow shall be provided.

4.4.7.5 *The deadman handle is to be located at the operating station, is to be easily operated by one hand and designed so that when dropped onto the ground or stowed it is not normally possible for it to become operative. For stowage, a simple open box, with water drain hole, is adequate. Although difficult to achieve, every effort shall be made when designing the operating station area not to create nooks or crannies where an operator could place and leave the deadman handle in the operating / active state. A deadman timer system Green prompt lamp is required.*

4.4.7.6 *No deadman override shall be provided for over-wing fuelling applications. (Over wing refuelling shall be done by operating deadman.*

4.4.7.7 *The deadman operation, with minimal reaction time, shall shut-off flow evenly in not less than 2 to 5 seconds from the maximum rated flow of 3000 litres/minute, overshoot quantity after release of the handle being less than 200 litres.*

When the deadman valve is signalled to open, initial response shall be with minimum delay and flow shall increase evenly from zero to maximum in not less than 5 seconds. There is no upper time limit from the viewpoint of safety, but for practical reasons 15 seconds shall be regarded as a maximum.

4.4.8 Meters

4.4.8.1 *Two positive displacement (PD) meters shall be provided. One (main) meter will be for flow through the reel and deck hoses, the other for the over wing delivery. The meter shall be designed as per the requirements set forth by API MPMS 6.4 manual of petroleum measurement standards chapter 6-metering assemblies, section 4-metering system for aviation fuelling facilities*

Turbine type meters are not acceptable for sales purposes.

4.4.8.2 *The over wing fuelling meter shall be a suitable for the flow rates.*

4.4.8.3 *The main meter shall be accompanied, when purchased, by a calibration / test certificate using kerosene or a test fluid with a viscosity representative of Jet A-1*

This meter is available with optional flow configurations - left to right or vice versa.

4.4.8.4 *Meter characteristics are to be:-*

• *Accuracy to be:-*

a) *+/- 0.05% at 75% of meter rated maximum flow rate or the maximum achievable if less.*

b) *+/- 0.2% at 20% of meter rated capacity.*

• *Maximum linearity* a) *0.18% for 4 inch and 6 inch triple-capsule size*

b) *0.15% for 3 inch and 4 inch double capsule size*

c) *0.10% for 2¹/₂ inch and 3 inch single capsule size*

• *Repeatability shall not exceed 0.02%.*

• *The indicated reading of the mechanical rate of flow indicator (ROF) shall be accurate to +/- 5% of the true value.*

4.4.8.5 *The meter register must be fitted with a non-resettable totaliser and a large numeral counter. The right hand wheel or drum must be subdivided. Measurement units shall be in litres.*

4.4.8.6 *The meter shall be capable of occasional over speeding by 25% without damage or losing set calibration.*

4.4.8.7 *Meters must be able to operate / count under reverse flow and shall be fitted with a rate of flow indicator.*

4.4.9 Reels and hoses

4.4.9.1 *Deck Hoses:-Two delivery hoses 2 ½ inch in accordance with EN 1361 type C. 3.7 meter long 2 ½ inch Female coupling for vehicle end with BSPP tread and other end 2 ½ inch male coupling with BSPP tread .*

Reel Hoses:- Two delivery hoses 2 ½ inch in accordance with EN 1361 type C. 30 meter long 2 ½ inch Female coupling for vehicle end with BSPP thread and other end 2 ½ inch male coupling with BSPP thread.

Overwing Hose:- One delivery hoses 1 ½ inch in accordance with EN 1361 type C. 20 meter long 1 ½ inch Female coupling for vehicle end with BSPP tread and other end 1 ½ inch male coupling with BSPP tread .

Attachment screw threads shall be BSPP.

The couplings shall be of the bolted clamp type meeting VG.85 328 / VG.95 950 requirements.

Swaged couplings are not acceptable and shall not be used.

Hose coupling tails shall be stainless steel.

4.4.9.2 *Under-wing hose reels shall be of the Catherine wheel type, single width with a minimum core diameter of 600 mm, and be located close to the meters and controls.*

Catherine wheel type hose reels are preferred and Drum or bobbing multi-width type hose reels are also acceptable when used for small bore over-wing hose application.

4.4.9.3 *Swivel joints, which need grease for lubrication, are not permitted.*

In addition, the design of the swivels shall be such that seals are easily accessible and can be replaced without the need to either remove the reels or engage in major disassembly work.

4.4.9.4 *The reels are to be free running out and hydraulic power rewind. The control levers (each with lock, reel out, rewind functions) are to be situated at the hose reels, on the pumping control station side only.*

Rewind speed shall be adjustable by means of a valve or other device which can be locked / sealed in its set position.

4.4.9.5 *Suitable rollers or trays below the reel and rollers at the pull off points are required to ensure proper hose handling, prevent drooping and tangling etc.*

- 4.4.9.6 *Hoses must be easy to pull off the reels under all conditions but adjustable devices to prevent excessive overrun, when pulling stops, shall be provided if necessary.*
- 4.4.9.7 *Male threaded connections are required on hose reel outlets. It shall not be necessary to remove the reel outlet elbow in order to facilitate hose removal. The female swivel nut connection on the hose at reel end shall be easily accessible using normal tools.*
- 4.4.9.8 *Hose reels must be suitable for testing hoses to 20 bar while still connected.*

4.4.10 Filter monitor

- 4.4.10.1 *Only IP/API approved stainless steel vessels shall be used. These comply with IP/API requirements and are fitted with an interlock system so that the cover cannot be closed unless all elements are installed. The size of the filter monitor element shall be two inch (2")*
- 4.4.10.2 *The filter monitor cover shall have a swing bolted cover (not flanged through bolts) and be installed to allow easy removal of the elements without the need to remove any other components or panels. It shall be situated to open on the opposite side of the fueller from the 'operating station'.*
- 4.4.10.3 *It shall have $\frac{3}{4}$ inch low point / sample drain lines with ball type isolating valves both at the vessel and at the sampling outlet point on both clean(down stream) and dirty(up stream) sides of the filter element mounting/division plate. The sample / drain lines shall be as short as possible and conveniently positioned for use with a bucket or jar.*
- 4.4.10.4 *The filter monitor is to be fitted with a piston type differential pressure gauge. Isolating valves shall be fitted in the sense lines together with a valve to allow fuel from the underside of the piston to be bled to a collection jar for the purpose of verifying that the integral filter is not blocked and that the piston is free to move over the whole of its potential stroke. The low pressure side isolating and piston chamber bleed (drain) valves may be combined into one multiport valve if desired.*
- 4.4.10.5 *An automatic air eliminator is required on the highest point of the filter monitor. The air bleed line is to be taken back into the tank through a visible flow (ShoFlo) indicator, easily identifiable from the control station. The flow indicator shall not be a plain window type, but shall incorporate a ball or spinner to indicate that flow is occurring. The design shall be such that incoming air or vapour will easily displace accumulated liquid downstream - i.e. it shall be self draining. Air shall be able to pass freely into the tank vapour space, but liquid leakage shall pass via a tube to the bottom of the tank. A non return valve shall be installed in the air eliminator line to ensure that the filter cannot drain back into an empty tank (fueller) via an open foot valve.*

4.4.11 Elevating platform and hoses

4.4.11.1 **A double scissors pattern** elevating platform system, hydraulically powered Elevating platform is required immediately to the rear of the driver's cab. **Fork lift type** platform are not acceptable.

Pivot joints shall be essentially self lubricating and **maintenance free** without the need for regular greasing.

For **enhanced stability**, the scissors arm support area dimensions shall be such that they are adequate for the length / width of the platform.

Safety stays shall be provided and fitted in a convenient position for ready use.

4.4.11.2 **Actuation** would normally be from **2 hydraulic cylinders** spaced and positioned to give even support to the whole platform area. Cylinders which have a short stroke and are positioned at one side of the scissors arrangement do not, in general, provide adequate stability, and shall be avoided.

4.4.11.3 Hydraulic cylinders shall be of the **displacement type**. Direct acting cylinders with vented ends, with or without a leakage return line, are not acceptable. The cylinders shall incorporate **emergency 'fuses' or restrictors** to prevent rapid collapse in case of a supply hose burst. In addition, there shall be separate **flow control valves** to regulate the rate of ascent and descent.

Ideally, the fuses shall not activate even if the descent rate adjusting valve is inadvertently fully opened.

4.4.11.4 The platform is to be **adjustable** from the lowered position of approximately 1.60 metres up to 4.2 metres minimum (vehicle fully laden). Internal cylinder stops or blocks on the lower frame may be used to limit the extension of scissor lifts capable of reaching more than 4.2 metres.

Safety rails, minimum 975mm high, **toe board**, and self closing **gate** are to be fitted.

4.4.11.5 **The platform width** shall be equal to that of the tank. Typical minimum **internal area** dimensions shall be 2900 mm wide by 1370 mm length.

4.4.11.6 **The floor plate material** of the platform shall be corrosion resistant, removable, non slip, non abrasive to hoses, strong enough to support the weight of at least 3 people with safety, and have enough open area to allow proper drainage of rainwater.

The open strip mesh type is preferred over expanded mesh or pressed / perforated types.

4.4.11.7 **Access** between the **ladder and platform** shall be a relatively smooth transition for the operator, typically a rear facing extension area from the platform would be needed for this purpose. It must be possible for the operator to reach and leave the platform at its highest position.

*Special attention shall be paid to **safety** of the operator, For example, it shall not be possible, if the operator is climbing the ladder, for his foot to become trapped, shall the platform suddenly descend.*

4.4.11.8 ***Control lines** to and from the platform shall be routed neatly underneath and attached to the scissors horizontal arms using a combination of hose and tubing to suit. Lines shall not be bundled / wrapped together such that they form an unsightly assembly separate from or attached to the riser hoses.*

4.4.11.9 *Normal control for **adjusting platform height** shall be a single lever, 3 position valve raise / stop or neutral / lower. When released, the lever shall automatically return to the stop position. An **alarm** is required to sound when the platform is **descending**.*

4.4.11.10 ***Emergency lowering** valves must be provided - one on the platform and another accessible from ground level. These must function even if the normal platform control is jammed in the raise position.*

4.4.11.11 *An emergency **engine stop button**, of the push / lock off type, shall be fitted on the platform guard rail in an easily accessible position.*

4.4.11.12 *Normal design would be such that fuel supply to the platform would be via 2 x 3 inch bore '**riser**' hoses. These are looped downward between the platform and operational panel. One riser hose connects to the platform forward left, the other forward right.*

Riser hoses must not be routed to the side of the platform.

*Use of a **single large bore** / 4 inch hose is not permitted since this not only tends to be unsightly, but it also requires bifurcation on the platform, and tends to induce problems of kinking when bent tightly, even if swivels are installed.*

*Male threaded **hose couplings** shall not be used. The female swivel nut type are preferred but couplings with integral TW flanges are also permitted where more appropriate.*

4.4.11.13 *Both Platform **fuelling hoses** shall be laid - enter right / stowed left.*

***Isolating valves** are not required on platform hoses.*

4.4.11.14 ***The length** of the fuelling hoses must be such that there will be no additional strain applied to the aircraft adapter and fuelling nozzle when connected at a height of 5.4 metres (B.777 ref.) and the platform is in its **lowest position**.*

4.4.11.15 *Independent **stowages**, with brake interlock switches, are required for the two fuelling nozzles. These must not be placed on the platform floor, but instead, attached to the upper / forward end of the platform side guard rail.*

4.4.11.16 *No equipment which the operator is likely to use on a routine basis, such as sampling equipment or a bonding reel, shall be placed near, alongside or underneath the platform. This can be a serious **safety hazard** and lead to injury.*

4.4.12 **Miscellaneous Equipment**

The following miscellaneous equipment is to be fitted.

4.4.12.1 *Weatherproof **lockable stowage** for two 5 litre containers and miscellaneous sampling equipment shall be provided. Typical dimensions shall be 600 mm long x 600 mm. high x 250 mm deep. Standard electrical enclosure boxes, fitted with a wooden internal base panel, have been found suitable for this application.*

4.4.12.2. *A **sample recovery tank** of approximately 150 litre capacity, equipped with fill point, vent, dial or fire resistant window type level gauge and drain shall be fitted at operational station side.*

The fill point shall be of an easy to use design incorporating a funnel, removable screen filter and down pipe. The fill point cover shall be operable by one hand and stay in the open position when so set. Large diameter fill covers / inspection hatches of the type used on vehicle cargo tanks shall not be used.

The funnel opening shall be of an adequate size and positioned high enough above surrounding surfaces or obstructions so that a full 5 litre jar can be easily positioned and emptied without spillage.

4.4.12.3 *Two manual rewind reels, each with 40 metres of bonding cable and a substantial clip (MIL-C-83413/7) are to be fitted for fueller one near the pumping control station, the other on the opposite side of the vehicle in a convenient location.*

These may be used both for fuelling and bottom loading purposes.

Characteristics of the reel and its operation are important. Materials shall be corrosion resistant. It must not over-run on reeling out when the cable is no longer being pulled. It must not be stiff to rewind. It must be possible for the operator to properly / evenly guide the cable onto the reel over its full width, thus avoiding localised coil build up and subsequent loosening / overlaying / tangling. It must not be possible for the reel / cable to unwind due to vibration when the vehicle is moving.

The **cable** is to be very flexible, non corrodable, resistant to kink and have substantial tensile strength. Core material 16×14×0.15 single copper braided 3mm diameter, electrical resistant 0.007 Ohms per metre cable has been found to be very good and is recommended.

For protection against abrasion, it must be covered in a suitable, UV light resistant clear plastic coating.

The coating may be transparent (to aid location of faults or damage) or coloured bright yellow or have a reflective surface to aid visual identification of its presence on the ground.

An interlock switch is not required at the bonding clip securing point.

4.4.12.4 *A bonding connection shall be installed at each bottom loading point, the tank drain, the product recovery (dump) tank and at the drain panel.*

4.4.12.5 *Two bucket or scabbard type fire extinguisher holders shall be provided, one at each side of the fueller, suitable for both 9 kg. dry powder type units.*

They must be easy to use, at a shallow slope, with water drain holes and of non corrosive material. To ease handling and help prevent the hose from being squashed or damaged, wooden slats either side of the lower centre line may be found useful.

Holders, which require clamps or latches, must not be used.

4.4.12.6 *01 No. Two kg. CO₂ fire extinguisher shall be fixed in an accessible position in the cab.*

4.5 Pipe work, flanges and isolating valves

4.5.1 *All piping used shall be seamless Aluminium Alloy or Stainless Steel. Mild Steel is not permitted even if internal surfaces are completely coated by hot tin dip or epoxy lining.*

For visual appearance, pipe sections shall normally be butt welded together.

For information, the following stainless steel material has been found to be generally suitable.

Pipe to ASTM A.312, grade TP. 304 L, and Schedule 5S (0.083" thick). Forged flanges to ASTM A.182, grade F.304L. Wrought fittings to ASTM A.403 grade WP .304L.

ASTM grades A.321 and A.316 are also acceptable.

4.5.2 *Victualic joints and flexible couplings are not permitted downstream of the pump*

4.5.3 *Flanges shall be to ANSI.B16.5 class 150 pattern dimensions*

4.5.4 *Swivel joints are to be self lubricating, without the need for grease. Ductile iron swivels are not acceptable even if they are internally coated.*

4.5.6 *All pipe work is to be fully drainable. There shall be a drain line with ball isolating valve and Kamlock coupling / sealing cap installed from a point where the bulk of the fuel can be drained.*

Other piping low points are to be fitted with minimum $\frac{3}{4}$ inch BSPPF (mutter) drain points, fitted with screwed plugs (parallel thread with sealing washer).

4.5.7 *Plugged, parallel threaded connection ports shall be provided on pipe work in accessible positions to permit hose testing to be carried out on the fueller. Provision shall also be made in the design of the piping layout to permit in situ routine testing of the riser hoses to the elevating platform.*

4.5.8 *All hoses shall be capable of being isolated for routine pressure testing to 20 bars, without the need of removing them from the vehicle. Accordingly, all pipework, fittings and isolating valves, which would be subject to this pressure, shall be suitably rated for 'hose test use, even though the normal system hydrostatic test pressure is 15 bars. Isolating valves shall not leak in the reverse direction when subject to 20 bar applied from the downstream side.*

4.5.9 *All fuel sample, drain, sense and gauge lines shall be Stainless Steel except in sized of $\frac{1}{2}$ inch and above when Aluminium can also be used. Where there are individual sections as part of a whole, it shall be possible to dismantle them separately i.e. use compression ferrule type fittings and avoid multiple screwed joints.*

Elbow fittings with tapered threads must never be used in parallel threaded ports such as on the differential pressure gauge and filter monitor vessel.

4.5.10 *Valves on drain / sample lines are to be ball type, terminating in Kamlock type couplings with quick release sealing caps secured by retaining wires or chains.*

4.5.11 *Copper, Copper Alloys with more than 35% Copper, Zinc or Cadmium shall not be in contact with the fuel. All valves, couplings, and swivels etc. in contact with the fuel shall be non-ferrous. Valves may use Aluminium, Stainless Steel or chromium plated bronze components.*

4.5.12 *Where valves are actuated by pneumatic cylinders, consideration shall be given to protecting shafts and seals, which could be damaged in a potentially dirty / wet environment, by use of a flexible rubber boot.*

This may apply even if the shaft is made of stainless steel.

Advice on this aspect shall be sought from the cylinder manufacturer since in some cases, a rubber boot may accelerate rather than prevent wear by 'inhaling' and accumulating abrasive particles / moisture during the extension mode.

Chapter 5:- Tank and fittings

5.1 Tank design –Semi Trailer Fueller

5.1.1 Basic structure

5.1.1.1 *This specification gives some general design principles and particular requirements. For detail on material grades and thickness, or weld procedures refer NFPA.385, (pr) EN12312-5, ECE/TRANS/110 (ADR) and DOT 406*

5.1.1.2 The tank is to be made from Aluminium Alloy.

Refueller tank is to be a single compartment with a usable liquid capacity of 30,000 litres for Refueller a sump giving minimum dead stock and a minimum of 3% liquid expansion / ullage space. A typical gross 'rate' would be 3.76 litres / mm length.

With due regard for the constraints of width and height, length shall be minimised. the manlids and vent valves do not protrude above the tank top, but instead are set below it.

5.1.1.3 *The tanks must be able to withstand an internal pressure of at least 0.35 bar.*

5.1.1.4 *The tank sump / bottom, when mounted on the chassis / prime mover, in both the loaded and unloaded condition, shall have a bottom slope of not less than 2° (1:24 or 3.6%) from each end towards a single low point in a convenient central location.*

5.1.1.5 *The bottom interior surface must be smooth and free from pockets or depressions where water might collect. Welds around the sump and in the centre bottom area shall be ground flat / flush to prevent obstruction to water flow. Other welds, either of the baffles or tank plates, shall be positioned such that flow of water / water globules to the centre bottom and sump is not obstructed.*

5.1.1.6 *Refueller tank is to be fitted with suitable baffles to form divisions, each of about 5,000 litre capacities, varying according to the design constraints of the tank. Baffles shall be dished to give increased strength and acute angles at the tank shell joint shall be avoided.*

All baffles must be open at the top and the bottom for liquid levelling and be provided with substantially off-set (not overlapping) access holes, with smooth edges, approximately 600 mm. diameter at some intermediate height . it shall be possible for a person to clamber through these holes without undue difficulty. Internal piping must not pass through these access holes.

5.1.2 Miscellaneous

- 5.1.2.1 *The outlet line from the filter air eliminator and any other fill lines into the Refueller tank must be taken to near the tank bottom to minimise splashing. However, air shall be able to pass directly into the tank vapour space to avoid it bubbling up through the fuel.*
- 5.1.2.2. *A spring-loaded soft seat non-return valve is to be fitted at any point where sense or return or control lines enter the tank. This is to prevent spillage in case of accident damage or if equipment is removed for maintenance.*
- 5.1.2.3 *A side mounted contents gauge, unaffected by tank pressure, is required - see item 5.4.3.*
- 5.1.2.4 *Any appendages fixed to the tank (ladders, grips, braces, etc.) shall be suspended from pads or brackets welded to the tank shell.*
- 5.1.2.5 *Flat washers lock washers and self locking nuts / stiff-nuts are to be used on all bolted or studded fastenings.*
- 5.1.2.6 *Studs or captive nuts must not be welded to the tank shell, affixed pads or brackets.*
- 5.1.2.7 *An access ladder shall be fitted at rear of the tank and the tank top shall have an aluminium chequered walkway from the access point to the manholes.*
- 5.1.2.8 *Electric cables / conduit must not be positioned such that they provide a convenient hand hold or grip for someone climbing onto the tank top.*
- 5.1.2.9 *No pressurised fuel delivery pipes are permitted to pass through the tank.*
- 5.1.2.10 *One and half inch (1 ½") rapid drain line shall be installed from the tank sump, flush with the bottom and not surrounded by raised welds, to an accessible point. A ball valve shall be installed at the sump end and the outlet shall terminate in a 1 ½" inch ball valve and 1 ½ inch extended pipe with BSPP sealing dust cap.*
- A ¾ inch sample line and valve shall be connected into bottom of the 1 ½ inch line as close as possible to the outside valve.*

5.2 Tank attachments and controls

5.2.1 Top fittings

- 5.2.1.1 *Hinged manhole cover assemblies shall be provided to enable the tank to be inspected internally. They shall be of lightweight construction but sufficiently robust to withstand rough treatment. They shall be capable of being locked or sealed and shall be easily detachable from the tank for maintenance purposes.*

- 5.2.1.2 *When pressure / vacuum valves (or other equipment) are fitted to the manhole cover they shall be so positioned that they are protected from damage in case of any vehicle overturn.*
- 5.2.1.3 *The arrangement of vent valve and cover installation shall be such that there will be no liquid spillage when the Refueller is on an incline of 1:15 (6.7%), the most suitable position for this equipment are the centre two baffled sections as opposed to the end ones.*
- 5.2.1.4 *The manhole arrangement shall be positioned so that if the cover is inadvertently left open, the cover will fall to the closed / latched position when the vehicle moves forward.*
- 5.2.1.5 *In order to provide for adequate gas freeing prior to entry of personnel, and to provide for escape in case of emergency, at least 3 openings for the trailer tank each of 600 mm diameter shall be available. These may form part of the manhole / inspection hatch installation, or may be separate.*
- 5.2.1.6 *Any recess on top of the tank, which could collect rain water, shall be provided with a drain tube, minimum diameter 25 mm.*
- 5.2.1.7 *Stainless steel studs / fasteners shall always be used for attaching manlids and cover plates to the top of the tank.*

5.2.2. Bottom loading

- 5.2.2.1 *Two non selective bottom fill point flanged connections shall be fitted on each side of the fueller , one of each pair being fitted with a 2 1/2 inch aircraft type self-sealing adapter and metal sealing dust cap, the other being blanked.*

Flange type Isolating ball valves are required downstream of the bottom loading adapters with sealing provision for open position.

- 5.2.2.2. *Required height for the centre line of bottom fill point flanged connections shall be in between 550 and 750 mm.*

They shall be positioned so that they are not overly vulnerable to impact damage.

- 5.2.2.3 *The tank filling systems must be arranged so that fuel flow is stopped automatically when the fuel level reaches a predetermined maximum. The bottom loading valve shall be positioned on the same side as the operating station. Two automatic high-level shut-off valves shall be provided (first to act as primary and second to act if first fails) One of the high level detectors shall be the jet sensing type, acting in conjunction with a wholly mechanical / hydraulically balanced bottom loading valve. Drain tubing shall be 'anti static', resistant to fuel, and be substantial enough not to kink easily.*

Systems using floats, magnetic switches or air pressure shall not be fitted.

5.2.2.4 *A pre-check system, removable and serviceable from outside the tank (i.e. normally mounted on a pad or block flange), is to be fitted adjacent to the bottom loading valve in order to simulate loss of the hold open pressure to the high level jet sensor, thus causing the valve to close.*

The pre-check test device also acts as an emergency closure for the bottom loading valve before the fueller is full but it will not otherwise act as an emergency stop if the loading valve itself is faulty and allows liquid over spill.

5.2.2.5 *Inside the tank, the bottom loading valve shall be fitted with a deflector to minimise splashing and cause the product to flow laterally.*

5.2.3 Outlet valve

5.2.3.1 *The outlet / emergency / foot valve on the Refueller tank outlet is to be mechanically or pneumatically actuated from the operating station, located as close as possible to the pump inlet. Low level indication shall be provided before suction loss of the pump. If necessary, a suitable vortex breaker shall be fitted.*

5.2.3.2 *An emergency button or mechanical trip device is also to be located on the opposite side of the Refueller to close the foot valve. Emergency closure trips / stops shall not require a pull action actuate them - rather, a push action shall be necessary, the device remaining in the actuated / stop position until reset.*

5.3 Tank venting and pressure relief

5.3.1 Normal service - loading, fuelling

5.3.1.1. *With due allowance for safety factors, sufficient venting capacity shall be provided to cope with thermal breathing, fuel loading at up to 4,000 litres / minute and for delivery up to 4,000 litres / minute.*

5.3.1.2 *The valves used for these purposes shall be wholly mechanical, self contained and automatic in operation. Air operated vents connected to the loading or delivery system shall not be used.*

5.3.1.3 *General requirements and practice are that for outward vapour flow, the vent valve system shall begin to open at approximately 70 m. bar for thermal breathing, and 175 m. bar for loading with a sufficient number of small and large capacity devices provided so that the tank internal pressure does not exceed 175 m bar.*

For inward flow, the vent valve system shall begin to open at a differential pressure of 4.5 m.bar with a sufficient number of small and large capacity devices provided so that the tank is not subject to a vacuum of more than 70 m.bar.

Vent valves of different types and sizes within the system may have different settings, provided the above overall requirements are met at the liquid loading and discharge flow rates specified.

5.3.1.4 *For safety purposes, the valves shall restrict leakage of product 15 ml in 30 minutes in the event of vehicle overturn and when subject to a pressure equivalent to 110% of the maximum static head of liquid in the tank.*

Valves shall be fitted with a fine mesh wire screen (wire 0.3 mm minimum diameter, maximum aperture 0.5 mm x 0.5 mm) or an acceptable multiplate / wound equivalent.

5.3.1.5 *The valves may be all of one type or a combination of various capacities according to what can be provided by the manufacturer.*

For example, small valves attached to the manhole covers may be used for thermal venting with larger ones fitted alongside or elsewhere on the tank. Alternatively, if the manufacturer can provide high capacity valves for cover installations, additional vents elsewhere may not be necessary.

5.3.2 *Emergency - fire engulfment, liquid overspill*

5.3.2.1 *To cope with fire engulfment, additional pressure relief / venting shall be provided by the manhole covers or other special purpose, high capacity vent valves lifting against a spring - they shall begin to open at not less than 210 m.bar, and be fully open at 350m. bar. The manlids / emergency devices shall not lift under normal operation for venting purposes.*

5.3.2.2. *The venting devices shall have a minimum flow capacity, at 350 m.bar tank pressure, of equivalent free air based on a log / log graph constructed using the following data points (general application).*

<i>Approximate Tank Capacity - m³</i>	<i>Total Surface Area m²</i>	<i>Capacity of Free Air m³ / hour</i>
<i>1</i>	<i>6.2</i>	<i>1,817</i>
<i>8</i>	<i>24.8</i>	<i>7,269</i>
<i>57</i>	<i>124.0</i>	<i>18,070</i>
<i>150</i>	<i>347.0</i>	<i>25,602</i>

The basis for calculation is NFPA.30, using 75% wetted area and n-Hexane plus 22%, included to allow for Jet A-1 molecular mass, enthalpy of evaporation, relieving temperature and the isentropic exponent of fuel vapour. These figures also cover the Avgas requirement, this being 19% greater than for n-hexane. When tanks are circular or elliptical in cross section, the above tabled capacities for Jet A-1 will need to be increased by up to 14.5% - e.g. for up to 86% wetted area.

5.3.2.3 *The fueller covered by this specification requires an emergency venting capacity of 15,500 m³/hour of equivalent free air at 350 m.bar internal pressure.*

5.3.2.4 *The size of holes at the top of the baffles is critical and shall be determined by calculations similar to those used for bursting discs - e.g. B.S. 2915. These holes shall be large enough to allow vapour to flow easily, with minimal pressure drop, from baffled sections with no emergency venting device to those so provided, thus preventing changes in liquid level which could otherwise result in the vent being blocked / flooded with liquid in a situation which would otherwise be contained.*

5.3.2.5 *The equipment provided for emergency air venting shall also be capable of preventing the tank pressure from exceeding 350 m.bar in the event of liquid overspill at flow rates up to 4,000 litres/minute.*

5.4 Tank calibration and contents

5.4.1 *The tanks are to be calibrated in litres. During calibration, the refueller is to be standing on level ground, with all tyres inflated to the correct pressures.*

5.4.2 *An aluminium dip tube shall be fitted in tank. The closure shall be such that any excess pressure in the tank will be released before the closure can be removed.*

The tube shall have an opening in the wall above the maximum contents level to provide a pressure balance.

A captive black anodised aluminium or hardwood dip stick or equivalent is to be provided with each tank, calibrated and marked with suitably small increments according to actual measurements.

The marking must be directly in volume units. Those which require reference to calibration tables are not acceptable.

5.4.3 *A 250 mm diameter tank contents gauge is to be fitted in fueller tank to indicate either litres x 1000 (preferred) or as a minimum - empty, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and full - based on actual measured volumes. The fueller manufacturer will therefore need to make or obtain a new scale for the gauge. Operation must be unaffected by the pressure in the tank. The gauge is to be fitted on the same side of the tank as the fuelling control station.*

Chapter 6:- Testing and records

6.1 *Testing shall be performed after completion of painting.*

6.2 *On completion, hydrostatic pressure of 15 bar or 20 bar(as applicable) are to be applied to the fuelling circuits, followed by performance/functional tests to check that all items are in good working order.*

These tests shall be repeated in the presence of the representative of Ceylon Petroleum Corporation.

- 6.3 *The tank shall be subjected to a hydrostatic test of 0.35 bar measured at the top surface.*
- 6.4 *A set of filter elements for flow testing shall be provided by the constructor.*
- 6.5 *Proof is to be furnished that the filter monitor has been hydrostatically tested to the design test pressure.*
- 6.6 *A calibration / test certificate for the meter shall be available.*
- 6.7 *A complete functional test on all items of equipment shall be undertaken prior to shipment of the refueller.*
- 6.8 *An Inspection test report and record shall be completed and forwarded with a copy also being included in the vehicle operating / maintenance manual.*
- 6.9 *Six weeks prior to inspection & testing, the contractor shall forward an inspection and performance test schedule for the approval of the client. The schedule shall cover all the major and important components of the equipment / vehicle offered. It shall also include equipments and gauges used for inspection and testing.*

Chapter 7:- External painting

7.1 General

The vehicle is required for operation in a humid, saliferous, tropical climate having a humidity of about 90% maximum, bright sunlight, sea breeze and a daily average air temperature range of 35 °C / 40 °C. Surface temperatures will be much higher.

Coatings shall also not be harmed or readily discoloured by contact with grease, oil, hydraulic fluids, fuels or routine pressure / chemical washing.

It is therefore essential that surfaces to be painted are correctly prepared and properly coated, with particular attention to hidden surfaces to avoid early breakdown of paint film. The final finish must be smooth and free from specks and runs.

The mating faces of bolted assemblies must be sealed with a mastic type compound to prevent corrosion resulting from the entry of water.

Any components or assemblies which ought not to be painted, such as nozzles, hoses, interlock switches, screw threads, adjusting devices, pressure / vacuum valves, data plates etc., shall be removed or suitably masked. Open ports shall be securely capped.

7.2. Finish coating:-

The tank, cab (if necessary) and other components (as required) shall be under coated and top coated according to the paint manufacturers instructions.

Particular care must be taken to achieve the correct film thickness at each stage, taking into account the surface texture / finish of the item being painted. If necessary, additional coats shall be applied but excessive thickness shall be avoided as this can reduce the durability of the coating.

Specks and runs, shall be avoided and in the case of the tank, will not be accepted.

- 7.2.1. Upper half of the cab, fueller trailer shall be painted in white (RAL 9010) and the lower half in "Signal" red (RAL 3000). The chassis / prime mover and trailer frame shall be painted in Grey (RAL 7000).*

Section C: - Instruction Manual (IM)

Supplier shall provide following Manuals/Catalogues on delivery of the Aircraft Refueller and shall cover the entire units. All such manuals shall be in English.

- 1. Workshop Manual for the Chassis / prime mover - One Copy*
- 2. Spare Part Catalogue for the Chassis / prime mover - One Copy*
- 3. Operations & Maintenance Manual for the Refueller Module - One Copy*
- 4. Spare Part Catalogue for the Refueller Module – One Copy*

IM 1 Contents and format

The manual shall provide clear and comprehensive guidance on vehicle operation and maintenance, so that it can be kept in good working order. All due allowance shall be made for lack of user familiarity with a completely new vehicle.

A typical content / arrangement would be as described in IM2 to IM6.

IM 2 Miscellaneous sections

- IM 2.1. A title page showing manufacturer's name / address / telecommunication details, customer, purchase order number, works order / serial number. This shall be followed with 4 colour photographs showing the vehicle right and left views, the rear, and tank top (to include fittings / manholes / vents).*

- IM 2.2 An index / contents list showing the various sections and list of illustrations.*

- IM 2.3 A list of applicable specifications and standards - e.g. BS, ISO, EN etc.*

- IM 2.4 General safety precautions relations relating to workshop practices, fire prevention/precautions, toxic vapours/fumes, the battery, main electrical equipment, asbestos packing (if any).Also list sources of potential danger*

when loading, driving, fuelling etc. and stress that the equipment shall only be operated by personnel qualified to do so by the user company.

IM 2.5 *A list of threaded fastener sizes used - metric/UNC/UNF/BSW/BSF etc., with spanner/ hexagon sizes and recommended torque values.*

IM 2.6. *Basic vehicle data - chassis / prime mover details (make/model/VIN/engine model/power output/serial no/wheel-base etc.) - actual measured weights per axle when loaded-tyres/pressures-actual dimensions (heights of cab, tank, platform, overall length, width)- tank fabrication number - scissor lift fabrication number.*

IM 2.7 **General description**

This shall be written to aid understanding of the more complex details later in the manual. Content can be short or long according to the other information provided. A simple diagram shall be included.

IM 2.8 **Tank and fittings**

This detailed information is necessary as preparation for the operating instruction and commissioning procedure sections.

To cover topics such as - description including attachments and their controls- bottom loading valve-high level shut off and test cock - manlids and vents - contents gauge - dip stick - sampling and rapid draining.

IM 2.9 **Operating instructions**

To be read only at first, in preparation for carrying out the commissioning procedure.

To cover such topics as - loading from the depot - self loading - platform operation - engaging/ disengaging the pump - reeling out and rewind the hose reels - starting flow(to recirculate or fuel aircraft) - fuelling operations with a trailer - stopping flow - depressurising the hoses - defuelling aircraft - use of emergency engine stops - use of the sampling cabinet and dump/recovery tank - use of the interlock override - etc.

IM 2.10 **Commissioning procedure**

To cover topics such as - packing removal - installing (as applicable) nozzles, filter elements, fire extinguishers bonding reels or anything else such as lights, fuses and relays which may have been removed for safe keeping during shipment/transportation - loading - purging air from the fuelling pipework - purging air from the SPCV/ deadman valve- recirculating via each hose - checking /cleaning nozzle strainers - purging air from the defuel pipework - clearing of tank and filter sample / drain lines etc. Also it shall be cover in

detail with block diagrams the procedure for re-commissioning after a major overhaul of the vehicle.

IM 3 **System detail sections**

These sections are needed to describe very clearly, details of the various systems as follows. For clarify, it is suggested that numbered items on circuit drawings also be given a letter prefix.

Where the systems interface, the diagrams shall so indicate and thus, the related or linked item will be easier to identify.

It is suggested that the following letter prefixes be used:-

- A - Fuelling system - e.g. A5 Meter, A17 Fuel sense pressure gauge.*
- B - Pneumatic system - e.g. B17 Foot valve control, B9 Interlock override switch*
- C - Hydraulic system - e.g. C23 Cylinder, C4 Flow control valve, reel*
- D - Electrical system - e.g. D35 Pump tachometer, D12 1/S relay unit*
- E - Miscellaneous - e.g. E17 Drawbar coupling, E6 Pump speed control cable*

Each of these sections shall include a clear circuit diagram, on large size paper (A3 folded) for clarity if necessary, with all components given a discreet item number such as C5, D23 etc. with any interfaces to other systems shown.

For example, the electrical circuit diagram will have most items marked with the prefix D but when electric interlock switches are used, there will also be a B item shown representing the solenoid actuated pilot valve for the brake system.

Where components can fall into two categories, it is suggested that the code letter to apply is that for the first diagram in which it appears.

For example, the pneumatic operator of a foot valve, code A, would also have a code A. When the same pneumatic operator was illustrated with other pneumatic B components, it would still be code A.

Similarly, a pneumatically operated pressure switch to activate a warning light would appear as code B in both pneumatic and electrical systems. Each section shall also include a table showing, for example, the following information:-

<i>Item</i>	<i>Part No.</i>	<i>Description</i>	<i>Qty.</i>	<i>Location</i>	<i>Supplier</i>
<i>A20</i>	<i>N2005060010</i>	<i>Non return valve</i>	<i>01</i>	<i>Tank rear, right hand side defuel line</i>	<i>Northvale Korting</i>

Where it is not feasible to describe the item location such that it could be easily found, then simple sketches or photographs shall be provided.

*For wholly bought out/unmodified items, the **original manufacturer's part numbers** must be used. Where items have been purchased and modified or added to by the fueller manufacturer to form a distinguishable separate assembly, then preferably, the separate part numbers shall be given. Where this is really not feasible, a new unique part number may be given and the fueller manufacturer may be given and the fueller manufacturer may be mentioned as the supplier.*

IM 3.1 Fuelling system A

Comprising - *Diagrams of the fuelling circuit and operating panel. parts list, operating/functional descriptions of fuelling/defuelling, secondary pressure control system, depressurising etc.*

Reference shall be made to the item numbers on the circuit and what occurs when each control is selected.

IM 3.2 Pneumatic System B

Comprising - *A diagram of the pneumatic circuit including inter-connections with other systems, parts list, operating/ functional descriptions of pump selection, fuel/defuel selection, deadman control system (if pneumatic), air reference supply to the SPCV, brake interlock system, engine stop control system, trailer interlock and foot valve controls etc.*

Reference shall be made to the item numbers on the circuit and what occurs in what sequence to what component, where air can go and does go under various circumstances.

IM 3.3 Hydraulic System C

Comprising - *A diagram of the hydraulic circuit including, parts list, descriptive information on safety, cleanliness, the reservoir, pump, pressure relief and flow control system, hose rewind and elevating platform operations/controls. Reference shall be made to item numbers on the circuit and where the oil travels in each situation. There shall also be a section here, or under 'Trouble Shooting' per item IM 4.2 describing how to remedy a 'stuck up' platform and re-set the various flow controls. This may be necessary following injudicious opening of the platform cylinder outward flow control, allowing excess flow rate and triggering of the cylinder emergency*

fuses/ restrictors. In turn, this would cause the platform to stick in the up position or only descend exceptionally slowly.

IM 3.4 Electrical system D

Comprising - A diagram of the electrical circuit including wire colours and interconnections with other systems, parts lists, operating/functional descriptions of operations lights, obstruction lamps, deadman system (if electrical), pump speed tachometer, pump/road drive warning lights, platform alarm, brake interlocks (if electrical switches), brake override warning light, battery isolator, alternator protection circuit etc.

IM 3.5 Miscellaneous items E

Comprising - Itemised parts list/location description etc. Components to be included with diagrams if necessary can include such things as pump speed controls, sampling cabinet, chain tensioners, hose reels guide rollers, trailer drawbar coupling, bonding reel, nozzle stowage assemblies/shrouds, scissors lift assembly, cab fire extinguisher, drive shaft modifications (gearbox to pump, pump to rear axle), recovery tank contents gauge, earthling/bonding lugs, tamper proof covers for adjusters, hydraulic drive coupling on the product pump extension, latch on bottom loading coupling interlock lever etc.

IM 4 Maintenance sections

IM 4.1 Routine inspection and lubrication.

This part of the manual applies to the items and equipment installed by the fueller manufacturer as opposed to the chassis / prime mover itself. Aspects covered shall include recommended **lubricants** and **schedules** - daily, weekly, monthly, 3 monthly, 6 monthly etc. as appropriate.

Typical details might be:-

Daily - check air reservoir drain

Weekly - check/top up hydraulic oil reservoir level , grease drawbar coupling pin, top up the pneumatic system lubricator and drain water, operate fuel/defuel selector and trailer foot valve switches to prevent seal stiction.

Monthly - Apply a few drops of oil to the drawbar actuating lever, platform gate hinges, air cylinder pivots pins, deck nozzle stowage cover hinges, bottom loading interference bar pivots. Apply grease to spring loaded catches. Check/top up oil level in the fuelling pump gearbox.

3 monthly - check /top up oil level in the bulkmeter gearbox. Check/replace oil filter in hydraulic system Clean the pneumatic system filter elements. Lubricate the hose reel rewind chains.

6 monthly - change the oil in the fuelling pump gearbox.

IM 4.2 Trouble shooting

Clearly it is not possible to cover every eventuality and difficulty which might be encountered in a complex system. Sections covering the fuelling,

pneumatic, hydraulic, and electrical systems shall be good enough for users to educate themselves and decide what may be causing trouble. Nevertheless, the following major difficulties shall be addressed and suggestions made to investigate and remedy the situation.

- *Brakes cannot be released.*
- *Interlock action to apply brakes slowly or not working.*
- *No fuel flow when in the fuelling mode.*
- *Flow rate unusually low in the fuelling mode.*
- *Release of the deadman handle does not stop flow or flow stops too slowly.*
- *Release of deadman does not return pump speed to idle.*
- *No fuel flow when in the defuelling mode.*
- *No fuel flow when bottom loading.*
- *Elevating platform will not rise, stop rising or lower.*
- *Fuel pump will not engage or disengage or gears baulk.*
- *Reels will not rewind, lock or free-wheel out.*

IM 4.3 Recommended spare parts

The bidder shall submit the following priced spare parts lists along with the bid.

- (1). *To cover **normal requirements** for approximately 2 years operation, on a per unit basis.*
- (2). *To cover anticipated **major maintenance requirements** over a 5 year period, on a per unit basis.*

IM 4.4 Component servicing and repair

In this section, it will not be sufficient only to enclose manufacturers' general leaflets and information sheets.

In some cases, for the more simple assemblies, it will be sufficient to provide only the drawings covered by item IM 6 below.

In other cases, complete and current information will be required for such items as:-

*Bulk meter - Fuel pump - Platform hydraulic cylinders - Hose reel swivels
Fuelling nozzles and regulators - Secondary pressure control/deadman valve
Tank foot valve - Bottom loading valve and high level sensor – Filter monitor
element changing - Fuel/defuel valve - Differential pressure gauge - Hydraulic
pump and motors*

IM 5 **Test certificates**

Certificates shall be provided for the tank pressure test, bulk meter calibration, the 5 bar general circuit pressure test, the 20 bar system test downstream of the closed line isolating valves.

In addition, the manufacturer shall enclose a copy of his own test schedule/results.

A copy of a check list for verifying all the chassis / prime mover options and type variants specified on the purchase order shall be provided for easy reference.

IM 6 **Illustrated parts list and drawings**

General arrangement, sub-assembly and any useful detail drawings or descriptive sketches, which are not included elsewhere, shall be placed here, together with an index. The aim shall be to provide as much information as possible in the form of an “illustrated catalogue” of components, with readily available (not necessarily specially created) exploded views and parts lists so that locally, equipment can be dismantled/repared if necessary without specialised overhaul instructions to hand.

As necessary, the drawings shall be marked with the item number from the detailed parts list and placed in sections A, B, C and E. Full size drawings shall be carefully folded and kept in plastic pockets, together with any other booklets and leaflets and leaflets covering complete units, such as pressure control equipment, meters, etc.

04. SCHEDULE

SCHEDULE OF PRICES

**Bid for the supply of 01 No. 30,000 Litres Capacity, Low Profile, Semi Trailer,
Aircraft Refueller**

	<u>Import & Supply</u>	<u>Currency</u>	<u>Amount in Figures</u>
1.	Unit Price (F.O.B.)	.....	.....
2.	Less Discount, (if any)	.....	.....
3.	Total Freight Charges	.....	.....
4.	Total C & F Cost	.....	.....
5.	Cost of Pre-Shipment Inspection by a Third Party (as per clause 2.2.1 of COC).	.....	.....
6.	Cost of Witness of Inspection by two (2) CPC officials as per Claus 2.2.2 & 2.2.3	.....	.....
7.	Cost of provision of Operations and Maintenance Training for CPC Staff (as per clause 2.3 of COC)	.....	.....
8.	Cost of Workshop Manual and Spare Part Catalogue for the Engine & Chassis / prime mover (as per Clause 1.2.1 of ITB)	.....	.....
9.	Agency Commission,(if any)	.....	.....
10	Grand Total.....		

Grand Total in Words:

Offer Validity :

Delivery Period :

Payment Terms :

Country of Origin :

Warranty Condition :

Name of Bidder :

Address :
.....
.....

Signature of Bidder :

Company Seal:
(Rubber Stamp)

05. ANNEXURES

Form of Bid

To: *The Chairman
Ministry Procurement Committee,
c/o Supplies function
Ceylon Petroleum Corporation
1st Floor, Rotunda Tower
109, Galle Road
Colombo 3
SRI LANKA*

From:

.....

.....

Sir,

A-1 Having familiarized ourselves with the formal request for Instruction to Bidders and Conditions of Contract, Technical Specification for Supply of 01 No. 30,000 Litre Capacity, Low Profile, Semi Trailer, Aircraft Refueller we offer to complete the whole of said services in conformity with the said document.

A-2 unless and until a formal Agreement is prepared and executed this Bid together with your written acceptance thereof shall constitute a binding contract with us.

A-3 We understand you are not bound to accept the lowest or any Bid you may receive.

A-4 The Bid we are offering is complete and fulfils the requirements discussed in the Technical Specifications of the Bid document.

A-5 We agree to abide by this Bid for the period of Ninety One (91) days from the date of opening of the same. Bid Conditions and prices quoted shall remain binding upon us and may be accepted at any time before the expiration of the period.

A-6 We agree to be bound by the Bid, Bid Conditions, Technical Specifications and Performance Guarantee.

A-7 We affirm that the said items will be delivered withinmonths after we receive notice of acceptance of our Bid / establishment of the Letter of Credit from the CPC.

A-8 We offer the lump sum fixed price of (foreign cost in figures) (in words) and Sri Lanka Rupees (local cost in figures) (in words) for Supply of 01 No. 30,000 Litre Capacity, Low Profile, Semi Trailer, Aircraft Refueller to CPC as detailed out in this Bid document and details of the lump sum price is as given in the Schedule of Prices. We agree that it is open to the Ministry Procurement Committee to reject this Bid or to accept.

Dated this day of2010.

Signature in the capacity of.....
.....
..... duly authorized to sign bids for and on behalf of :

Name

Address
.....
.....

Witnesses:

1. Signature:	2. Signature:
Name:	Name:
.....
Address :	Address:
.....
.....

Company Seal (Rubber Stamp)

Format for Bid Security

[This Bank Guarantee form shall be filled in accordance with the instructions indicated in brackets]

.....*[insert issuing agency's name and address of issuing branch or office]*.....

Beneficiary : *[insert (by PE) name and address of Employer/ Purchaser]*

Date : *[insert (by issuing agency) date]*

BID SECURITY NO. :*[insert (by issuing agency) number]*

We have been informed that[insert (by issuing agency) name of the Bidder; if a joint venture, list complete legal names of partners] (hereinafter called " the Bidder") has submitted to you its bid dated[insert (by issuing agency) date] (hereinafter called "the Bid") for execution/ supply [select appropriately] of [insert name of Contract] under Invitation for Bids No. [insert IFB number] ("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[insert name of issuing agency] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of[insert amount in figures][insert amount in words] 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; or*
- (b) does not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter "the ITB") of the IFB; or*
- (c) having been notified of the acceptance of its Bid by the Employer/ Purchaser 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 shall expire: (a) if the Bidder is the successful bidder, upon our receipt of copies of the Contract signed by the Bidder and of the Performance Security issued to you by the Bidder; or (b) if the Bidder is not the successful bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder that the Bidder was unsuccessful, otherwise it will remain in force up to[insert date]

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

[signature(s) of authorized representative(s)]

Form of Agreement

This Agreement made this _____ day of _____ 2010, by and between CPC established by an Act of Parliament namely Act No. 28 of 1961 & having its registered Office at 109, "Rotunda Tower", Galle Road, Colombo 03 in the Government of the Democratic Socialist Republic of Sri Lanka (hereinafter called and referred to as the "CPC" which terms of expression as herein used shall where this context so requires and admits mean & include the CPC & its Successors & assigns) of the one part and _____ of _____ a Company duly incorporated & having its registered Office at _____ (hereinafter called the "Supplier" which terms of expression as herein used shall where this context so requires and admits mean & include the _____ & its successors & assigns) of the other part.

Whereas the CPC is desirous that the Goods known as the 01 No. 30,000 Litre Capacity, Low Profile, Semi Trailer, Aircraft Refueller shall be supplied by the Supplier and has accepted a Bid by the Supplier for the supply of such equipment, and the remedying of any defects therein.

The CPC and the Contractor agree, as follows: -

- 1. In the Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract and Supplier's scope of work hereinafter referred to.*
- 2. The following documents shall be deemed to form and be read and construed as a part of this Agreement.*
 - Letter of Acceptance dated _____.*
 - The Technical Specifications*
 - The Bid dated _____.*
 - The Conditions of Contract*
 - The Completed Schedules and*
 - The Supplier's Proposals*

3. *In consideration of the payments to be made by the CPC to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the CPC to supply and remedy any defects therein, fit for purpose in conformity in all respect according to the provisions of the Contract.*

4. *The CPC hereby covenants to pay the Supplier in consideration of the Supply and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Agreement at the times and in the manner prescribed by the Agreement.*

In Witness whereof the parties have hereunto caused this Agreement to be executed the day, month & year afore written.

<i>Authorized Signature of the Chairman Of CPC</i>		<i>Authorized Signature of the Supplier</i>	
<i><u>In the presence of</u></i>		<i><u>In the presence of</u></i>	
<i>Name</i>		<i>Name</i>	
<i>Signature</i>		<i>Signature</i>	
<i>Address</i>		<i>Address</i>	

FORMAT FOR PERFORMANCE GUARANTEE

.....[issuing Agency’s Name and Address of issuing Branch or Office].....

Beneficiary :[Name and Address of Employer]
.....

Date :

PERFORMANCE GUARANTEE NO :

We have been informed that[name of Contractor/ Supplier] (hereinafter called “the Contractor”) has entered into Contract No.[reference number of the contract] dated
.....with you, for the [insert “ construction”/ “Supply”] of
.....[name of contract and brief description of Works] (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 [name of Agency] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of[amount in figures] (.....) [amount in words], such sum being payable in the types and proportions of currencies in which the Contract Price is payable, 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 expire, no later than theday of, 20... [Insert date, 28 days beyond the scheduled contract completion date] and any demand for payment under it must be received by us at this office on or before that date.

.....
[Signature(s)]

COMPLIANCE / DEVIATIONS SHEET

Please mark “√” if complied with the tender requirement or mark “X” if there is any deviation and indicate the deviation in the cage provided.

Important:

Failure to furnish the mandatory information/documents listed in the Form of Compliance / Deviation Sheet - Annexure F before the closing of Bid will result in the Bid being rejected.

	Specification/Condition		Complied	Deviation if any
1	<i>Name of Refueller Manufacturer and Country of Origin.</i>	Mandatory		
2	<i>Company profile of the Refueller Manufacturer</i>	<i>General</i>		
3	<i>Detailed technical specification of the Aircraft Refueller model offered covering chassis / prime mover and all major components</i>	Mandatory		
4	<i>Certificate from the Manufacturer that the Aircraft Refueller model offered is of currently in manufacture and availability of spares for a minimum period of 10 years</i>	Mandatory		
5	<i>Name and address of the Accredited Local Agent for the Aircraft Refueller along with Legally Executed Power of Attorney issued by the Refueller Manufacturer and valid copy of Certificate of Registration issued by the Registrar of Companies</i>	Mandatory		
6	<i>Name and address of the Accredited Local Agent of the Chassis / prime mover manufacturer along with Legally Executed Power of Attorney issued by the Chassis / prime mover Manufacturer and valid copy of Certificate of Registration issued by the Registrar of Companies</i>	Mandatory		
7	<i>A Commitment Letter from the Accredited Local Agent of the Chassis / prime mover Manufacturer declaring the agreement for providing after sales services & supply of spares for the next 10 years period.</i>	Mandatory		
	<i>Confirmation from the Chassis / prime mover Manufacturer that the engine model offered meets the Diesel fuel specification (Clause 3.2.1.1.2 of the technical specification) available in Sri Lanka.</i>	Mandatory		
8	<i>Documentary evidence on import & supply of minimum of 30 units of heavy vehicles of the Chassis / prime mover Brand offered to Sri Lankan market during the past 10 years.</i>	Mandatory		
9	<i>Agreed with the requirement for Pre-Shipment Inspection by 3rd party including approval of CPC as per clause 2.2 of the COC & agreement to the scope of work of the 3rd party inspection company given in Annexure G</i>	Mandatory		

10	<i>Selected 3rd Party Inspection Company Given</i>	<i>Mandatory</i>		
11	<i>Inspection / Performance Testing criteria of the Aircraft Refueller and agreement to furnish test certificates on delivery of the Aircraft Refueller</i>	<i>Necessary</i>		
12	<i>Manufacturing Schedule and Manufacturing Quality Plan</i>	<i>Necessary</i>		
13	<i>Past supply records of Air- craft Refuellers on commercial use in the International Market for the last 10 years, which shall include International Airports in minimum of five (05) different countries outside the country of manufacture together with supplier details and user recommendation.</i>	Mandatory		
14	<i>Agreed with the warranty conditions given in Clause 2.4 of the COC.</i>	Mandatory		
15	<i>A Commitment Letter from the bidder that all major breakdowns and / or repairs of Chassis / prime mover, Engine and Refueller module within the warranty period can be undertaken on urgent basis through his Local Agent.</i>	Mandatory		
16	<i>A list of recommended spare parts with prices separately, for Chassis / prime mover & Refueller module for 02 years operations.</i>	<i>Necessary</i>		
17	<i>A dimensional drawing showing key dimensions of the layout of the entire Aircraft Refueller. It shall include dimensions of the platform, operational panel, height of the Refueller, width of the Refueller and distance between the front end of the Refueller tank and rear of the cab</i>	Mandatory		
18	<i>Flow Schematic Diagrams for Fuel, Hydraulic, Pneumatic Systems and Electrical (Double Pole) Wiring.</i>	<i>Necessary</i>		
19	<i>Schedule of Prices (Schedule A) duly completed and signed.</i>	Mandatory		
20	<i>Bid validity per clause 1.6</i>	Mandatory		
21	<i>Form of Bid (Annexure B) duly completed and signed.</i>	Mandatory		
22	<i>Bid Security (as per Annexure C).</i>	Mandatory		
23	<i>Agreed with Shipment & Delivery conditions per Clause No. 2.6</i>	Mandatory		
24	<i>Agreed with Delivery Period per Clause No 2.6.3</i>	<i>Necessary</i>		
25	<i>Document Fee & Bid deposit Paid for each Principal Bidder</i>	Mandatory		
23	<i>Agreed with Payment Terms & Other Requirements</i>	Mandatory		
24	<i>Agreed with Penalty on Delayed Delivery per Clause No. 2.8 of COC</i>	Mandatory		
26	<i>Agreed with Freight arrangement through Ceylon Shipping Corporation or any other freight forwarder</i>	<i>Necessary</i>		
27	<i>Certificate of quality requirement</i>	<i>Necessary</i>		
28	<i>Name & Address of Local Agent (if any) & Agency Commission Given</i>	<i>Necessary</i>		
29	<i>If Relevant, VAT Registration No. of the local agent Given</i>	<i>Necessary</i>		

30	<i>Deviations from Specifications, terms & conditions, if any, indicated</i>	Mandatory		
31	<i>Other Deviation, if any</i>	<i>Optional</i>		

.....
Company Stamp

.....
Signature of the Bidder

SCOPE OF WORK OF THIRD PARTY INSPECTION COMPANY

- 1 *Certify that following equipments are in compliance with applicable standards / specifications*
 - a) *Electrical Enclosures - IEC 144/BS.EN 60947/ IP 65 standard*
 - b) *Double pole master switch -BS 5345*
 - c) *PD Meter- API MPMS 6.4*
 - d) *Pipes- ASTM A 312 grade TP. 304L and Sch 5S, or ASTM grade A321 or ASTM grade A 316*
 - e) *Flanges- ASTM A 182 grade F 304L (Dimensionally in accordance with ANSI B 16.5)*
 - f) *Pop rivets material- BS 1473 Al Mg 5 or Similar*
- 2 *Certify that hydrostatic test for tank and piping circuit is in accordance with applicable test pressures defined in chapter 6*
- 3 *Certify that the hydraulic and pneumatic systems are leak free*
- 4 *Verification of mechanical integrity of the complete unit*
- 5 *Verification of tank calibration and contents.*
- 6 *Confirmation of stability and weight distribution.*
- 7 *Welding procedure approval, welder qualification and welding inspection.*
- 8 *Verify that the electrical requirements defined in **section 3.3.2** are met.*
- 9 *Verification of the marking requirements as per API 1542*
- 10 *Certify the as build drawings.*
- 11 *Submission of Final compliance & Acceptance report*