



CAPITAL PROGRAM TENDER REQUIREMENTS

LOCOMOTIVE CAB and REAR UNIT EOT'S

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Date: 13 July 2010

Circulation Restricted To:

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1. SCOPE OF THE TENDER

1.1 The tender comprises the manufacture and supply of End of Train (EoT) and Head of Train (HoT) devices as per specification BBB1776 Version3.

| 1. CAB (HoT) units: | QTY | Delivered to | Type and notes |
|--|------------------|---------------------|---|
| 1.1 37 Class diesel locos | 30 | Pretoria | 3.3.1.4b,d |
| 1.2.34 Class diesel locos | 20 | Pretoria | 3.3.1.4b,d |
| 1.3 10E Class locos | 65 | Pretoria | 3.3.1.4b,d |
| 1.4 7E Class locos | 25 | Pretoria | 3.3.1.4b,d |
| 1.5 43D Class diesel locos | 1- 55 56 -110 | Pretoria | 3.3.1.4b,c |
| 1.6 ORE line loco units | 50 | Saldanha | 3.3.1.4b,d + On train repeater |
| 1.7 ORE line Trolleys | 8 | Saldanha | 3.3.1.4b |
| 1.8 ORE line Tipplers | 5 | Saldanha | 3.3.1.4a |
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| 2. REAR (EoT) units: | | | |
| 2.1 37 Class diesel locos | 30 | Pretoria | GPRS included |
| 2.2 34 Class diesel locos | 20 | Pretoria | GPRS included |
| 2.3 10E Class locos | 65 | Pretoria | GPRS included |
| 2.4 7E Class locos | 25 | Pretoria | GPRS included |
| 2.5 43D Class diesel locos | 30 | Pretoria | GPRS included |
| 2.6 ORE line rear units | 20 | Saldanha | GPRS included |
| 2.7 ORE line tipplers | 5 | Saldanha | GPRS included |
| | | | |
| 3. REAR (EoT) chargers units: | | | |
| 3.1 37 Class locos. | 30 | Pretoria | Charger cable included |
| 3.2 34 Class locos. | 20 | Pretoria | Charger cable included |
| 3.3 10E Class locos. | 65 | Pretoria | Charger cable included |
| 3.4 7E Class locos. | 25 | Pretoria | Charger cable included |
| 3.5 43D Class diesel locos. | 30 | Pretoria | Charger cable included |
| 3.6 ORE line chargers | 25 | Pretoria | Charger cable included The front and rear must use the same charger. |
| 3.5 Charge adaptors cable to fit other TFR chargers (Optional. TFR will adjudicate if needed) | 30 | Pretoria |  Adaptor cable to fit these two connectors. |
| 3.6 Charge adaptors cable to fit other TFR chargers. (Optional. TFR will adjudicate if needed) | 1-70 71- 140 | Pretoria |  Adaptor cable to fit these two connectors. |
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| 4. Portable cab housing <i>without</i> HoT. | | | |

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| 4.1 Portable cab unit with battery connectors and all wiring. | 5 | | 3.3.1.4a See: Portable EoT unit for dimensions. The standard CAB unit must fit inside. |
| 5. Chain and locks (Optional. TFR will adjudicate if needed) | 1- 100 101- 195 | (25 delivered to Saldanha & 170 to Pretoria) | The supplier must include his lock if it is integral to his telemeter otherwise the supplier must also quote for a separate lock & chain. |
| 6. Pipe & coupler (Optional. TFR will adjudicate if needed) | 1- 100 101- 195 | 25 delivered to Saldanha & 170 to Pretoria | The supplier must not include the pipe and coupler to the EoT price. The supplier must quote for a separate pipe & coupler unit. The supplier can quote an additionally item and include the pipe if there is a reduced cost benefit to TFR. |
| 7. EoT remote heads. | 1-55 56 - 110 | Pretoria | Direct Ethernet connection See: Telemeter remote head for dimensions and Annexure-B |
| 8. Fix repeaters . | | | . |
| 8.1 Fix units in standard CAB format | 1-10 11-20 | Pretoria | Fix repeaters 3.3.1.4a Fix repeaters must repeat both rear to front and front to rear messages via ONE radio. TFR need for management and maintenance purposes to monitor the operation of these repeaters remotely via GPRS. (See Annexure-D) |
| 8.2 Housing with battery backup | 1-10 11-20 | Pretoria | See: Portable EoT unit for dimensions. |
| 9. Keys & tools | 1-50 51-100 | Pretoria | The supplier must quote for extra keys to work on |

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| | 100 -200 | | his REAR telemeter if an integrated lock is used and for the lose key & chain requirement in this tender. Any special tools required must be quoted separately. |
| 10. Gerotek vibration & rust test. (Optional. TFR will decide and adjudicate if required) | | | |
| 10.1 CAB unit | 1 | | The supplier must quote on ONE Gerotek test. TFR will decide if the equipment must be subjected to the test. If the equipment fails then the supplier must fix the problems and carry any further Gerotek test cost to prove the compliance of his equipment. |
| 10.2 REAR unit | 1 | | The supplier must quote on ONE Gerotek test. TFR will decide if the equipment must be subjected to the test. If the equipment fails then the supplier must fix the problem and carry any further Gerotek test cost to prove the compliance of his equipment. |
| 11. Driver Training (SOR) (Optional. TFR will decide and adjudicate if required) | 20 | Esselenpark | + -1day and all documents in bind format must be supplied. Training must have a practical component using a complete telemeter set. <ul style="list-style-type: none"> ➤ Operating CAB unit (Normal, TCS, Rep modes) ➤ Operating rear unit ➤ Understanding rear indications. |
| 12. Technician Training (SOR) (Optional. TFR will decide and adjudicate if required) | 20 | Esselenpark | + -2day and all workshop manuals must be supplied. Training must have a practical |

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| | | | <p>component using a complete telemeter set.</p> <ul style="list-style-type: none"> ➤ Loading new software ➤ Configure parameters. ➤ Faultfinding at replacement unit level ➤ Retrieving logger data. ➤ Charger tests. ➤ GPRS tests ➤ Full functional tests. |
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| 13. Antenna VSWR indication | TFR prefer that all new EoT and HoT's include this function. The CAB unit must indicate the vswr in the technician area while the REAR unit must populate the GPRS field. |
| 14. Interfacing with present EOT's | A supplier who deliver EOT's in the past to TFR and quote on this tender must include in the CAB units the protocol to talk to his old rear units not supporting the protocol defined in this tender. |
| 15. Delivery | The supplier must indicate clearly the delivery schedules. |
| 16. Testing | The supplier will provide all test equipment needed to evaluate the final product. |
| 17. Approving the CAB unit housing | The successful supplier must provide one sample for approval before full production starts. (If not supplied previously to TFR) |
| 18. Rear unit GPRS tracking | All rear units must have GPRS tracking included. The rear unit must comply to GPRS tracking specification BBD5420 version-2 |
| 19. Portable units | The portable units must have external Power ,VHF, GPS antenna and data logging connectors. The standard CAB unit must fit inside the portable unit. |
| 20. ORE line CAB units | The CAB units must have the on train repeater function included and activated. |
| 21. ORE line trolley CAB units | These units must have the special software function included as described in the specification. |
| 22. Testing and certifying. | The supplier shall test and certify his units as per spec and or against a TFR ATP before TFR will |

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| | attempt acceptance testing of any equipment. |
| 23. Chargers | The chargers must have swappable end peaces. The charger must be able to charge the rear unit while the GPRS is active. The charger must have a build in function to revert automatically to trickle charge when the battery is full. |
| 24. Locks & chain. | The lock and chain must be quoted separately as one unit. |
| 25. Pipe and coupler | The pipe and coupler must be quoted separately as one unit. TFR are interested in using the units on AIR & VACUUM trains in the future pending on the easy of use, simplicity and cost implications. |
| 26. Automated Train line test function. (Request for information) | <p>TFR want feedback from the suppliers on the feasibility to implementation this function on their HoT's. The supplier must indicate the cost implication to supply this function in one unit for testing and to equipped all future latest supplied telemeters.</p> <p>The Driver select the menu "Train brake line test" The HoT check with the EoT for distance and speed correlation and then request the Driver to do a light brake application. The HoT gave the Driver 10 sec to do it after which it check with the EoT if the rear brake value drop at least 50kpa. If the HoT are satisfied with the readings a massage "Train brake line successful" or " Train brake line Failure" is displayed.</p> |
| 27. Count down odometer (Request for information) | <p>TFR want feedback from the suppliers on the feasibility to implementation this function on their HoT's. The supplier must indicate the cost implication to supply this function in one unit for testing and to equipped all future and latest supplied telemeters.</p> <p>The Driver select the menu "Odometer" on the CAB HoT. The HoT check the length of the train then add the error length and start counting down the odometer using the CAB GPS. The count down value will be displayed in the non vital right portion of the display. When completing the count down a short beep will be reported to the Driver and the count down counter will disappear. Every odometer activation will be recorded on the CAB telemeter. To make sure the distance is always on the save side using GPS data which is +-30m accurate the worst scenario will be take in consideration.</p> |
| 28. Accelerometer to monitor ruff EoT handling. (Request for information) | <p>TFR want feedback from the suppliers on the feasibility to implementation this function on their rear EoT's. The supplier must indicate the cost implication to supply this function in one unit for testing and to equipped all future telemeters.</p> <p>An Accelerometer must be build in to the REAR unit electronics measuring three dimension forces while on a train and send date when the preset parameters are exceeded. When Off the train and with zero Kpa it will indicate ruff EoT handling. The REAR EoT send a message</p> |

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| | via GPRS to a DB on an Oracle server. The REAR unit send the message every time it exceeding the accelerometer preset parameters or as per trigger list in the GPRS specification. A field already exist in the present GPRS DB structure. See annexure-D |
| 29. Compliance sheet. | The supplier must provide a compliant list based on al the attached specifications and this document. |
| 30. Contracts & Retention money. | A formal contract will be signed with the supplier where the delivery schedule will play a major role and at least 10% retention money will be hold back until the supplier complies fully with the specifications including the delivery of all documentation and resolving any design issues. |
| 31. Development Status. | <p>The supplier must indicate on a presentation basis how far his equipment and software functions complies to the specifications listed in this tender</p> <ol style="list-style-type: none"> 1. HoT CAB unit hardware with TCS and remote head interface. 2. HoT with the ORE line repeater function. 3. EoT REAR unit hardware with GPRS software. 4. Remote head with interface software to HoT. 5. Portable housing for repeaters. 6. EoT hardware with repeater function and GPRS management software. 7. EoT suitable for trolley working. 8. Implementing VSWR on CAB units. 9. Implementing VSWR on REAR units. |
| 32. SIM cards | TFR will arrange and activate the SIM cards operating on the two TFR APN's |
| 33. Beacon transmitter | All the ORE line rear units must be fitted with 433mhz beacon transmitters. The transmitting data message will be made available to the suppliers. |

2. GENERAL

2.1 Tenderers must fully acquaint themselves with all the requirements of TFR before submitting any tenders.

2.2 TFR must be consulted on all matters on which this specification is silent, or on which doubt exists.

End of document.