



SECTION 4.0 SPECIFICATION FOR TESTING AND COMMISSIONING (T&C)

4.1 General

The work covered by the specification under this section is for the supply of all materials, appliances, labour and necessary incidentals for the comprehensive inspection, service and maintenance of the Shooting Range System and ancillary equipment during the **one** year guarantee period. This specification shall also be applicable in the event the service and maintenance contract is awarded to the contractor after the expiry of the guarantee period.

All works to be performed under this specification shall be in accordance with good engineering practice and must be in strict accordance with this specification.

4.2 Scope of Testing and Commissioning

All equipment installed under the contract shall be tested in accordance with an agreed and carefully defined testing regime (On-Site Acceptance Test OSAT). An integrated logistic support package (IIS) shall be included within the contract(s), which all defines the spares and long-term equipment maintenance requirements for the facility. Equipment for these purposes shall include but may not be limited to the following systems :

- a. Target Systems
- b. Communication, CCTV and PA
- c. Air Ventilation System and Electrical System
- d. Bullet Protection
- e. Bullet Trap
- f. Public Health
- g. Other Specialist Equipment

4.2.1 On Site Acceptance Test (OSAT)

The Contractor shall be required to conduct the OSAT to ensure that the systems and equipment conform to specifications and performance requirements. The Contractor shall carry out the OSAT, after the systems are delivered installed and tested.

The Contractor shall be required to submit the OSAT procedures 2 months before the commencement of the installation of the system for review and approval. The OSAT procedure shall include the following topic:

- i. Purpose and Scope of Proposal
- ii. Title of each test
- iii. Objective of each test (parameters to be tested/verified)
- iv. Step-by-step description of each test to be conducted



- v. Expected or desired results
- vi. Criteria for acceptance (pass/fail) of results
- vii. Measured results/ observations
- viii. Test site personal and facilities requirements
- ix. Record of failure (discrepancy reports, with remedial action identified)
- x. Duration of each test
- xi. Any other relevant matters

The contractor shall be responsible for ensuring that proper corrective actions are recommended, implemented and proven effective for defect/faults found during the OSAT.

4.2.2 Integrated Logistics Support (ILS) Package

a. Concept

The ILS package proposed shall be based on the following inputs:

- i. Utilization Rate
- ii. The utilization rate of the system shall be at least 8 hours each day for the rangers.
- iii. Maintenance Concept
- iv. A two level maintenance support structure shall be adopted for the systems.
- v. Organization Level Maintenance
 - This level of maintenance shall be undertaken by the operator/users. The tasks include functional checks, visual inspection and exterior cleaning.
- vi. Intermediate/Depot Level Maintenance :
 - This level of maintenance shall be carried out under the maintenance element of this contract. Both preventative and corrective maintenance shall be accomplished at this level.

b. Spares Parts.

The contractor shall be required to propose lists of spares and consumables to support the system for a period of 5 years following the end of the warranty period. The Contractors shall provide the unit price of each spare proposed. The total price of the spares will not be summed into the tender bid.

For exposed accessories (e.g. antenna, brackets, etc) the contractors shall provide 50% as spares (over and above the quality required to operate the system).

The Contractor shall be required to supply all the necessary information to allow the End-User to catalogue the spares.

Spares, which are generally easily available at short notice on the local market, will be purchased by the users as required (e.g. monitors, video projectors etc).

The contractor shall make clear in his tender which spares he shall provide with



the contracts and shall suggest a suitable budget mount which the user should set aside for locally purchased spares for a period of 3 years following the warranty period.

c. Special Test Equipment (STE)

The Contractor shall indicate in their proposal whether any STE is required to support the maintenance of the system. The following information for each STE shall also be provided:

- i. Quantity Proposed
- ii. Unit Cost
- iii. Functional description of each STE including purpose, configuration, operation and maintenance requirements.

d. Documentation

The Contractor shall be required to provide the following documentation:

SIN	Documentation	Prelim Version	Delivery Date	Final Version	Delivery Date
1	Operation Manual	2 sets	3 months before operator training	4 sets	Together with the system
2	3 sets of maintenance including all part lists and circuit diagrams	2 sets	3 months before operator training	4 sets	Together with the system

Manuals shall be provided to detail out the operation and maintenance procedures. The operation manual shall describe in straightforward terms how each individual unit works and how simple trouble shooting can be undertaken. It shall also include the '0' level maintenance task to be performed. The maintenance schedules and detailed description of how to fault find, dis-assemble, repair and re-assemble components.

4.3 Practical Training

The practical training shall be conducted for at least two (2) JKR representatives to be nominated by the Pengarah Kanan Cawangan Kejuruteraan Mekanikal, Ibu Pejabat JKR.

a. The Contractor shall be required to provide the following training:

- i. Operators Training (Operation & '0' Level Maintenance)
- ii. Depot Level maintenance Training



b. For each individual course, the contractor shall be required to specify :

- i. Qualification of each instructor
- ii. Maximum number of trainees per class allowed
- iii. A synopsis of each individual course
- iv. Course syllabi
- v. Course duration
- vi. The skill level/academic level required for the trainees
- vii. The skill level which the trainees will attain on completion of the course

The operators and Depot Level Maintenance Training shall commence after the successful completion of the OSAT.

4.4 Scope Of Work for Maintenance

The contractor shall provide all materials, appliance, labour and necessary incidentals to carry out the following:-

- (a) The contractor shall inspect service and maintain the aforesaid system and equipment in accordance with the Inspection, Servicing and Maintenance Schedule as set in Section 5 clause 10. The routine service as listed in this Schedule shall be the minimum that shall be provided by the contractor and may be upgraded based on the recommendations by the equipment manufacturer or equipment usage requirement anytime during the maintenance duration.
- (b) The contractor shall advise the S.O. of defects on any part/s of the system observed during routine inspection and service and shall repair such defects.
- (c) The contractor shall provide emergency repair service during normal working hours and also during overtime hours if required to do so by the S.O.
- (d) The contractor shall also periodically instruct the operators responsible for the operation of the aforesaid system and equipment on correct and safe method of operating the plant and equipment.
- (e) The contractor shall also carry out repairs arising out of his neglect during periodical maintenance or arising due to his failure to carry out the periodical maintenance. Such repairs inclusive of supply of parts shall be carried out by the contractor at no additional charge to the government.
- (f) All repairs on the aforesaid system and equipment shall also be guaranteed by the contractor against defects in workmanship and materials for a period of one year to take effect from date of completion of repairs.



4.5 Workmanship And Material

The work described in this specification shall be performed by workmen skilled in the inspection, service, maintenance and repair of the aforesaid system and equipment.

All materials to be supplied in connection with the work under this specification shall be new, unused and shall generally be of the best quality as regard manufacture and performance.

4.6 Supervision

The contractor shall have a foreman in charge of the inspection, service, maintenance and repair work to be carried out under this specification. This foreman must be thoroughly competent in supervising the inspection, service, maintenance and repair of aforesaid system and equipment and shall be in the direct employ of the contractor, and acceptable to the S.O.

The contractor shall have in his direct employ, workmen who are especially skilled in the inspection, service, maintenance and repair of the aforesaid system and equipment.

4.7 Consumable Materials

The contractor shall supply the following consumable materials as and when required:-

- (a) All oils and greases required for lubrication of pumps, bearings, motor bearings, pivots and other moving parts.
- (b) All consumable filter elements.
- (c) All carbon brushes required to replace worn brushes in electric motors.
- (d) All electric contact points /contactors / relays /timers required to replace worn electric contact points in switch gears, motor starter gears, electric control gears and electric relays.
- (e) All cotton waste, soap detergent and other cleaning materials required for cleaning purposes.

The cost of these consumable materials shall not be charged for separately, but shall be included in the cost quoted by the contractor for the service and maintenance of the aforesaid system and equipment at the time of submitting his tender.