Serial	Functional /Non-Functional Area	System Requirement	Measure of Performance	Remarks	Candidate Priority	Link to UR	Validation Method	Compliance Assessment	Tenderer's Compliance Justification/Comments
1	Obsolescence Management	The system shall have an OSD of 2033. The system shall be capable of an obsolescence managed service with no degradation to current outputs and performance criteria.	MSTAR System shall reach 2033 as a minimum without any foreseen obsolescence issues.	It is not the intention of this requirement to delay delivery for obsolescence management. Current obsolescence issues are to be initially addressed so that performance across all functionality and outputs remain at least as good as the current Mk IV system over the duration of the contract and option years until 2026 as a minimum.	Key	UR-1, UR-111, UR-114, UR-115, UR-116	Review of the Technical Proposal		
2	Performance	The MSTAR ORP shall deliver a system it replaces that as a minimum, delivers the same performance and outputs as the current in-service system across all environments and climatic conditions. This will cover all functionality, supportability, availability, reliability, maintainability and training including usability by trained personnel and functional sensitivity (including false alarm rates), accuracy (against vehicles, people, FOS) at all ranges. This will include, but not be limited to, dead ground traces, clutter maps, alerts to the user, colour map overlays, MPI, correction data and remote workstation.	As a minimum at least as good as the system it replaces.	It is recognised that elements of the ORP may deliver consequential improvements to the system however it is not intended to incur additional time or cost to realise these benefits. This will include sensitivity (including false alarm rates), accuracy (against vehicles, people, FOS) at all ranges and usability by trained personnel This will include, but not be limited to, dead ground traces, clutter maps, alerts to the user, colour map overlays, MPI, correction data and remote workstation. Good includes such things as operator experience, speed of use, reliability, maintainability, supportability and training as well as the functional requirements.	Key	UR-1, UR-81	Review of Technical Proposal. Demonstrated in Live Firing. Tested at UAT Analysis. Manufacture to provide details of system performance and details of the techniques employed in rain and snow.		
2.1	Power	The system shall be powered to a level as least as good as the system it replaces.	At least as good as the system it replaces	This includes both the battery requirements and power supply such as mains. There should be no increase in the number of batteries required. The current system allows for 10W peak transmitter power for High power mode and 1W for Low power mode to be selected.	Key	UR-80	Review of Technical Proposal. Demonstrated in Live Firing. Tested at UAT		
2.1.1	Power	The System shall be able to be operated continuously and warn the operator when the power source (battery) is depleting.	At least as good as the previous system of changeover cable and clansman battery	The ability to change the battery without interruption to the full operating capability, degradation to the system or the need to power down and reconfigure the system through the use of a "hot swap" battery system is required. All fixed data contained must be retained.	Key	UR-80	Review of Technical Proposal. Demonstrated in Live Firing. Tested at UAT		

2.2	Front-End Saturation Power	The system shall have the same front-end saturation power level or higher than the system it replaces.	At least as good as the system it replaces	Any less than the old system will mean that the new radar is more vulnerable to jamming than the old system.	Key	UR - 34	Analysis. Manufacture to declare the saturation power levels. Where the saturation power levels is different this new scheme shall be assessed to ensure that the susceptibility to jamming has not been significantly affected.		
2.3	Remote Operation	The system shall be able to be remotely operated	At least as good as the system it replaces		Key	UR-64	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
3	Deployment	The system shall be to deploy and recover by Air, Sea and Land using existing and planned military infrastructure.	As a minimum at least as good as the system it replaces	Strategic and Tactical Air, Land and Maritime assets. Air drop for force elements with a parachute requirement (Air Assault, Commando and SF). Marinization for Commando forces. DEFSTAN 00-3 issue 4 dated 13 May 2011, design guidance for the transportation of equipment. DEFSTAN 81-41 Packaging of Defence Material parts 1-6. DEFSTAN 01-5 dated 17 Mar 2011, fuel, lubricants and associated products. DEFSTAN 61-21 Generic specification for batteries. DEFSTAN 58-96, Issue 4, Dated 10 Feb 2006. Pure Gases for Weapon Systems and Detectors Cooling Applications.	Key	UR-21	Review of Technical Proposal. Demonstrated in Live Firing. Tested at UAT		
3.1	Deployment – Time into Action	The system shall have a time into action which includes a system calibration test that is no more than the system it replaces.	At least as good as they system it replaces	Current MSTAR Mk IV Into Action Time is 3 minutes which includes a system calibration test.	Key	UR-41	Analysis. Manufacture to provide details on the calibration scheme employed by the system and the time taken for the system to self-calibrate at switch on.		
3.2	Configuration	The system shall be configurable quickly and easily to suit a mission or role.	At least as good as they system it replaces	'Configurable' means system is powered up, calibrated and ready to acquire targets and produce target coordinates.	Key	UR-41, UR-61, UR-63	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		

3.3	Electromagnetic Compatibility	The system shall be as Electro-Magnetic (EM) compatible complying with EMC requirements standards when in operation.	Compliant with DEFSTAN 69-411 Class A and operate at least as compatible as the system it replaces	Tempest compliant and shall be as interoperable with UK forces as the existing system. DEFSTAN 59-411 Class A	M	UR-34, UR-35	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
4	Detection	The system shall at the determined power level setting as a minimum to operate against the full current range of target classifications, with the same levels of accuracy, over the same distances day and night.	At least as good as the system it replaces	The current system has the following target set for both Low and High power modes. Walking person, small wheeled vehicle, Main Battle Tank (MBT), 81mm Mortar, 105mm Shell and Helicopter This includes detection, tracking and FOS over distances ranging from 100m – 42km	Key	UR-44, UR-45, UR-46, UR-47, UR-48, UR-49	Analysis and Demonstration. Completed by manufacture with modelling their system against all of the targets of interest. Demonstration at live firing.		
4.1	Detection - Polarisation	The system shall operate to at least the same polarisation as the current UK MSTAR Mk IV	At least as good as the system it replaces	Current UK MSTAR Mk IV can polarise of transmitted radar beam to be changed from linear to circular form. Current UK MSTAR Mk IV has the following modes: - Surveillance - Acquisition - Fall of Shot - Audio – Manual - Audio – Range Tracking - Audio – Auto Tracking - Set up data - Standby	Key	UR-66, UR-84, UR-62	Inpsection. Manufacture's data sheet. Demonstration. The ability for the user to select different modes can be demonstated at UAT.		
4.2	Detection Resolution	The system shall operate to at least the same resolution of range, angle and Doppler as the current UK MSTAR MK IV.	At least as good as the system it replaces		Key	UR-66	Analysis. Manufacture to show how the resolution of the range, Doppler and Angle was determined.		
4.3	Field of View	The system shall operate with the same Field of View as the current MSTAR MK IV system.	At least as good as the system it replaces	Current MSTAR Mk IV has a maximum elevation of 3° / 53 Mil-Radians (Mils). Current MSTAR Mk IV has a maximum Azimuth of 2.4° / 43 Mils	Key	UR-66	Inpsection and Demonstration. FOV obtained from data sheet and UAT to demonstrate the FOV at agreed points.		
4.4	Detection Accuracy	The system shall be as accurate in Azimuth, elevation, range, Radar Dynamic Range and Doppler as the system it replaces.	At least as good as the system it replaces		Key	UR-111, UR-84, UR-81	Analysis. Accuracy statements to be provided by the manufacture, which also details how these figures, were arrived at.		

4.5	Probability of Intercept	The system shall have a probability of intercept at least as good as the system it replaces.	At least as good as the system it replaces	This includes bandwidth, Effective radiated power (ERP) and scan patterns. Current MSTAR Mk IV allows for a time between scans adjustment		UR-111, UR-84	Analysis. Manufacture to declare the ERP. Where the ERP is different this value shall be assessed agasint other system parameters to ensure the POI has not been significantly affected. Analysis. Manufacture to describe the scan pattern. Where the scan pattern is different this new scheme shall be assessed agasint other system parameters to ensure the POI has not been significantly affected.		
4.6	Alerts	The system shall alert when an object movement is detected within the selected FoV.	At least as good as the system it replaces		Key	UR-67	Inpsection and Demonstration. FOV obtained from data sheet and UAT to demonstrate the FOV at agreed points Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
4.7	Susceptibility to Jamming	The system shall have side-lobes that are equal to or less than the system it replaces.	At least as good as the system it replaces		Key	UR-111, UR-34, UR-35	Analysis. Manufacture to declare the antenna side-lobes. Where the side-lobes is different this new scheme shall be assessed to ensure that the susceptibility to jamming has not been significantly affected.		

4.8	Frequency	The system shall operate in the same frequency band as the UK MSTAR Mk IV, adjustable through selectable frequency channels.	At least as good as the system it replaces	Current MSTAR Mk IV Frequency is 16.75 to 17/25 GHz therefore classified as a J Band Radar. Current MSTAR Mk IV has 4 selectable frequency channels.	Key	UR-81	Inpsection from Manunfactures data sheet Analysis of number of channels and their bandwidth		
4.8.1	Frequency - Doppler Frequency	The system shall operate to at least the same Minimum Detectable Velocity (MDV), the same Maximum Doppler frequency and the same tuneable minimum Doppler frequency levels as the current UK MSTAR Mk IV.	At least as good as the system it replaces		Key	UR-81	Inpsection. Manaufactures data sheet and system level testing		
5	Classification	The system shall be able to classify targets at least as good as the systems it replaces.	At least as good as the system it replaces		Key	UR-44, UR-45, UR-46, UR-47, UR-48, UR-84	Analysis. Manufacture to provide details of classification performance against the entire agreed target set.		
5.1	False Alarms	The system shall have no greater number of false alarms as the current UK MSTAR Mk IV.	At least as good as the system it replaces	This shall be performance levels in a benign (thermal noise only) environment.	Key	UR-67, UR-84	Analysis. Manufacturer to show how false alarm figures was determined and in what conditions it was declared.		
5.2	Geospatial	The system shall support geospatial data and referencing currently employed on the existing system.	At least as good as the system it replaces	BNG referencing as well as UTM, MGRS and Geodetic, which can be selected by the operator during live operation. GeoTIFF metadata Vector Map (VMAP) Level 1 standard	Key	UR-63	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
5.2.1	Geospatial Standards	The system shall comply with DefStan 00-102 – Policy on the Application of Geospatial Information Standards	Compliant		M	UR-63	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		

5.3	Tracking	The system shall have track functionality at least as good as the system it replaces.	At least as good as the system it replaces	This includes multiple target tracking capability, update rates and track accuracy.	Key	UR-43, UR-44, UR-45, UR-84	Demonstration. System tracking functions and accuracy can be demonstrated at UAT Inpsection. Inspection. Manufactures data sheet and system testing. Analysis. Manufacture to provide details of the number of targets that can be tracked simultaneously.		
5.3.1	Track Update Rate	The system shall have a track update rate at least as good as the system it replaces.	At least as good as the system it replaces	This requirement shall not include the time between scans which the current system allows to be set by the user.	Key	UR-43, UR-44, UR-45, UR-84	Inpsection. Manufactures Data sheet for all different modes.		
5.4	Display	The system shall have a latency that is as good as the system it replaces. This shall include the processing time and the refresh rate of the screen	At least as good as the system it replaces		Key	UR-84	Analysis. Manufacture to provide details of the system latency in different modes and against different targets.		
5.4.1	Clusters	The minimum number of active clusters that can be active, for subsequent classification shall be at least as equal as the current system.	At least as good as the system it replaces	The current system has 20 active clusters at any one time.	Key	UR-84, UR-65	Review of Technical Proposal. Demonstrated in Live Firing. Tested at UAT		
5.4.2	Dead Ground Trace	The system shall generate a dead ground trace	At least as good as the system it replaces		Key	UR-65	Review of Technical Proposal. Demonstrated in Live Firing. Tested at UAT		
5.4.3	Display Tracks	The system shall have a capability to display Trails, historic information of previous detections (tracks).	At least as good as the system it replaces		Key	UR-116, UR-84	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		

5.4.4	Display Maps	The system shall have the capability to display colour map overlays with areas of interest and alarm boxes.	At least as good as the system it replaces		Key	UR-63	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
6	Supportability (Availability, reliability and maintainability)	The system shall be supportable through availability, reliability and maintainability at least as good as the system it replaces.	As a minimum at least as good as the system it replaces	This will be Operational and Training Availability – as a combination of supportability, reliability, and maintainability. Support Analysis against DEFSTAN 00-600 shall provide a cost effective through life support solution encompassing all of the ILS Elements within the MSTAR scope. The system is supportable through life, withstanding Levels of Repair 1 and 4.	Key	UR-114	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
6.1	Codification	The system shall be a fully NATO Codified system.	All items fully NATO Codified as per DEFSTAN 00-600, DEFCON 117 and the Defence Logistics Framework (DLF).	Support Solution Envelope (SSE) Government Policy (GP) 3.2.	M	UR-117	Documentary evidence		
6.2	Reliability	The MSTAR ORP system shall have a Mean Time Between Failure (MTBF) that is at least as high as the system it replaces.	At least as good as the system it replaces.	Mean Time Between Failures (MTBF) is measured in hours.	Key	UR-111, UR-118	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
6.2.1	Reliability	The system shall be capable of successfully completing each requested mission against the BFM(s) with at least the same reliability as the system it replaces.	As a minimum at least as good as the system it replaces	A Reliability Demonstration Test (RDT) shall be used to evaluate this KSR against the MSTAR BFM, as shown at Part 4 of the CPRD. DEFSTANs 00-040, 00-044 and 00-049 refer.	Key	UR-111, UR-118	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
6.3	Maintainability	The system shall have a Built-in Test (BIT) detection and notification of faults. The system shall allow access, utilising technical documentation, for Level 1 maintainers to achieve a Mean Active Repair Time (MART) for corrective Level 1 maintenance tasks that shall not exceed the threshold time limit as defined.	Confidence Level for no faults found for each Line Replaceable Unit (LRU) of at least 95%. 30 mins for Level 1 with 95% of all corrective maintenance tasks completed within 60 mins.	In accordance with DEFSTAN 00-042 Part 4, Testability. BIT shall not impact upon time into action of the system. The active repair time is the time taken to diagnose a fault, repair and retest, assuming that all necessary tools are available and excluding the time taken to obtain any required spare parts.	Key	UR-114, UR-118	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		

6.3.1	Maintenance Planning and Management	The system shall incorporate a Usage Monitoring System which gathers, stores and processes usage data of the MSTAR ORP system via the Control and Display Assembly (CDA), such that system usage data is available to the user/maintainer.	Confidence Level for usage data for each LRU of at least 95%.		Key	UR-118	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
6.4	Supported Software	The system shall be provided with all relevant software sustained through life, it will be modular in design and upgradeable through obsolescence management.	As a minimum at least as good as the system it replaces	The system shall have: Software configurations and development shall be undertaken in line with recognised good practice, including the use of Software Life Cycle Processes – ISO 12207. A means to determine software and firmware configurations such that the User is able to determine configuration ID for all software and firmware loaded on the system The means to have its software reconfigured, updated and remapped by the User Data Manager forward at the Unit Formation. Be delivered with a loadable master copy of the system software on a device such as a CD or USB. The system shall be delivered and installed with Microsoft Windows Operating System in Kiosk Mode.	Key	UR-118, UR-114, UR-116	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
6.5	Factory Calibrations	The system shall have a time between factory recalibrations that is no more than the system it replaces.	As a minimum at least as good as the system it replaces		Key	UR-118	Inspection. Manufacture to provide details of calibration intervals.		
7	Security	The system must comply with all relevant and current IS security standards in accordance with current policy. The system must be secure, password protected, TEMPEST and BITLOCKER compliant and controlled with internal and external access data management and storage.	As a minimum at least as good as the system it replaces	Security Policy Framework for security aspects and to meet specific CESG Compusec Memo 7 (Reuse/disposal computer memory) and 8 (Password management). TEMPEST compliant in accordance with Good Practice Guide (GPG)-14 Issue 2.3, SDIP-27/2 and SDIP-29/2.	M	UR-31	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
7.1	Security – Risk Management	The system and its components shall be documented in a Risk Management and Accreditation Document Set (RMADS) in accordance with HMG Security Policy Framework (SPF) and MOD Policy so that it can be Accredited.	The system and its components documented in an RMADS	HMG Information Assurance Standard No1 (IS1) and Information Assurance Standard No2 (IS2) for the security standard of up to OFFICAL.	M	UR-31	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		

8	Environment / Climatic	The system shall have environmental performance at least as good as the system it replaces. Environmental performance shall cover temperature, humidity levels, icing or frosting, chemical & biological attack, atmospheric pressure, rainfall, dust & sand and wind speeds. Including the ability to deploy the system. The system shall withstand operating and stow climatic conditions of categories A2, A3, B1, B2, B3, C0, C1 & C2 (only stowed). The system shall operate at all times of day and night with minimum reduction in capability. The system shall operate in all appropriate environments without degradation.	At least as good as the system it replaces	Def-Stan 01-005, 61-21 and 58-96 DEFSTAN 00-035 Part 4. Manage and operate equipment at night in 10 -5 lux User able to set-up and operate the eqpt with service-issued cold weather gloves.	Key	UR-21, UR-81	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
8.1	Environment CBRN	The system shall be able to operate in a CBRN threat environment. .The system shall be protected from the effects of nuclear weapon release in the form of Endo-atmospheric EMP, Source Region EMP (SREMP), Exo atmospheric, high altitude EMP defined by the gamma radiation dose rate and non-nuclear EMP (NNEMP).	At least as good as the system it replaces	DEFSTAN 08-4 Part 4 Issue 3. DEFSTAN 59-411. DEFSTAN 58-6. DEFSTAN 08-004, 08-41, 00-72 and STANAG 4145	Key	UR-32, UR-33	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
8.2	Environmental Compliance	The system shall be compliant with all current environmental legislation	Compliant	DEFSTAN 00-56	M	UR-113	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
9	HFI	The system shall comply with HFI legislation.	Compliant	DEFSTAN 00-251 – Human Factors Integration for Defence Systems Part 0 to 3.	M	UR-61, UR-70	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
9.1	Crew Portable	The system shall be Crew Portable and not impair the user to perform their general tasks when equipped with the capability through physical burden.	At least as good as the system it replaces	DEFSTAN 00-3 Issue 4. Total system weight must not exceed 41 kg and individual items must not exceed 14 kg.	Key	UR-61, UR-70	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
9.2	Operation	The system shall operate intuitively and efficiently without increased cognitive burden.	As similar to the current system as possible	This is about ensuring the system is familiar to the user and does not increase training burden or significant procedural changes to how the current system is operated.	Key	UR-42, UR-61	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		

9.3	Safety	The system shall conform to all current and known UK national and international environmental and safety legislation noting RF and Telecommunications guidance.	As per DEFSTAN 00-56	IAW DEFSTAN 00-56. The system shall have a minimum safe operating distance that is equal or lower than the system it replaces. The minimum safe operating distance shall include the main beam as well as the side-lobes and behind the radar (operator).	M	UR-113, UR-83	Inspection. Manufactures Data Sheet		
9.3.1	Safety	The system shall be safe to operate, transport, maintain and dispose.	At least as good as the system it replaces	In accordance with BS5499, DEFSTAN 00-25 and 00-56	M	UR-112	Review of Technical Proposal. Demonstrated in FAT and Live Firing. Tested at UAT		
10	Training	The system shall enable training to be conducted to conduct training in accordance with the associated Training Needs Analysis (TNA) to provide training of Users and Maintainers.	Based on TNA. No greater training burden on the User than the current capability. As a minimum at least as good as the system it replaces	Individual training and CT levels 1 – 5. Individual, User and Maintainer training. The User shall be provided with appropriate documentation to train, operate and support the Capability through life. Measure of burden is time taken to teach an operator assumed to have no prior knowledge.	Key	UR-11	Review of Technical Proposal. Demonstrated in Live Firing. Tested at UAT		