COMMON HEAVY EQUIPMENT REPLACEMENT PROJECT (CHER)

REQUEST FOR INFORMATION (RFI)

W8476 – 185840/C

Bundle 2

VOLUME 2

Annex A – Statement of Work - Acquisition

Appendix A-1 – Simulator System Specifications (Revision 1)

1.   SCOPE

This appendix describes the simulator system technical and performance requirements. This appendix will replace the Simulator System Specifications (SSS) revision #0 published in Wave 1. Amendments published hereafter will reference SSS Revision #1.

2.   REVISION HISTORY

Revision Number	Wave Release	Comments
0	1	
1	3	Added rated requirements and options. Other updates and corrections.

3.   SIMULATOR SYSTEM SPECIFICATIONS LAYOUT

The following describes the layout and interpretation of the Simulator System Specifications (SSS) blocks.

1. ID – requirement identification number;
2. Requirement – description of the requirement; and
3. Requirement Type – identifies the type of information the requirement block is conveying. The requirement type is split into the following categories:

   a. Header – Title of the section or sub-section;

   b. Information – Statement providing contextual information;

   c. Mandatory – Mandatory criteria identifies the minimum requirements that are essential. These requirements are evaluated on a pass or fail basis. Proposals that fail to meet the mandatory criteria are given no further consideration;

   d. Rated – rated criteria are point rated and they identify value-added factors and provide a means to assess and distinguish one proposal from another in a Best Value solicitation. Proposals are not obligated to meet the rated criteria. Points will only be awarded for claims for which the Bidder has provided sufficient detail in accordance with the evaluation process to allow Canada to determine its validity. Rated criteria found acceptable in the bid evaluation will be incorporated into the Contract as mandatory requirements; and

   e. Option – These requirements are evaluated on a pass or fail basis and are included in the Financial Evaluation. Proposals which fail to meet the Options requirements will be deemed non-responsive and the proposal will not be given further consideration. The Bidder must commit to providing these Options to Canada, which Canada will exercise at its sole discretion. Once exercised, Options will be incorporated into the Contract and the Contract Price increased.

4. **SIMULATOR SYSTEM SPECIFICATIONS (Revision 1)**

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1	**1 SCOPE**	Header
SSS-SIM-56	**1.1 Purpose**	Header
SSS-SIM-2	This Performance Specification defines the functional, technical and performance requirements for the simulator systems being acquired by the Common Heavy Equipment Replacement Project (CHER). This document forms part of the Simulator System Acquisition Statement of Work (ACQSOW).	Information
SSS-SIM-22	**1.2 Background Information**	Header
SSS-SIM-25	The Common Heavy Equipment Replacement (CHER) project is a Canadian Army (CA) sponsored project that seeks to replace the Canadian Armed Forces (CAF) Heavy Support Equipment (HSE).	Information
SSS-SIM-26	The HSE fleet includes two subcategories of fleets: Heavy Construction Equipment (HCE) and Material Handling Equipment (MHE). The HSE fleet will fulfill a wide variety of tactical and administrative roles related to road and infrastructure construction and sustainment support. The HSE fleet will be used in the full spectrum of operations (domestic and expeditionary) from low-intensity to high-intensity conflicts in both low and high threat environments.	Information
SSS-SIM-58	CHER will procure dozers, loaders, excavators, graders, compactors, backhoes, all terrain cranes, forklifts, rough terrain container handlers, high speed armoured backhoes, dump trucks, dump boxes, variable height trailers and beavertail trailers.	Information
SSS-SIM-2443	CHER simulators will be required to simulate the following equipment: dozers, loaders, excavators, graders, backhoes, all terrain cranes and forklifts.	Information
SSS-SIM-59	The simulators will be used to teach equipment operation, build operator muscle memory and demonstrate proficiency.	Information
SSS-SIM-3	**2 DESCRIPTION OF THE SIMULATOR SYSTEMS**	Header
SSS-SIM-1957	The simulator systems consist of the simulator hardware, software, program, and housing of the simulator.	Information
SSS-SIM-72	The simulators will be used for the operator training for Dozers, Loaders, Excavators, Graders, Backhoes, All Terrain Cranes and Forklifts.	Information
SSS-SIM-1967	The simulator systems will be installed and integrated in multiple Canadian Armed Forces Bases.	Information
SSS-SIM-127	**3 SIMULATOR HARDWARE REQUIREMENTS**	Header
SSS-SIM-2116	**3.1 Simulator Operator Station**	Header
SSS-SIM-2117	The simulator operator station is used to train the HSE operators in a simulated environment.	Information
SSS-SIM-2011	The simulator operator station has two variants: motion simulator and portable simulator.	Information
SSS-SIM-2643	The motion simulator will be used to replicate the feelings of being in a real motion environment.	Information
SSS-SIM-2644	The portable simulator will be compact, easily transportable and used to complement the more immersive experience of the motion simulator.	Information
SSS-SIM-2639	The two variants must use the same software.	Mandatory Requirement
SSS-SIM-2645	The two variants must use the same training programs.	Mandatory Requirement
SSS-SIM-2813	The two variants must be able to be connected together to a closed network.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2870	The two variants must interact with the instructor station.	Mandatory Requirement
SSS-SIM-2888	The two variants must function with and without the instructor station.	Mandatory Requirement
SSS-SIM-2819	The two variants must connect to a remote network.	Mandatory Requirement
SSS-SIM-2640	The two variants must be manufactured by the same **OEM**.	Mandatory Requirement
SSS-SIM-2646	The two variants must use controls of same form and function.	Mandatory Requirement
SSS-SIM-2900	The two variants must use 110 v to 120 v power.	Mandatory Requirement
SSS-SIM-2852	Additional hardware (e.g. tablets, etc.) provided to support the training program requirements must use the same application software, from an end user perspective, as the operator stations.	Mandatory Requirement
SSS-SIM-2853	All exercises and tests executed on additional hardware must be integrated into a single overarching training program and must be integrated with the simulator management software.	Mandatory Requirement
SSS-SIM-2891	Any adjunct tools/hardware (e.g. tablets, etc.) provided to support the training program requirements must be an addition to, not a substitution for, any component of the Simulator System Specifications.	Mandatory Requirement
SSS-SIM-2649	The simulator operator station of both variants must be able to be used by a range of operators from **small operator** IAW ISO 3411:2007 not wearing **Personal Protective Equipment** (PPE) to **large operator** IAW ISO 3411:2007 not wearing PPE.	Mandatory Requirement
SSS-SIM-2095	**3.1.1 Motion Simulator**	Header
SSS-SIM-2141	The motion simulator is an operator station that has a motion seat to create the feeling of being in a real motion environment.	Information
SSS-SIM-149	**3.1.1.1 Motion Simulator Display System**	Header
SSS-SIM-128	**3.1.1.1.1 Motion Simulator Front Display**	Header
SSS-SIM-1887	The motion simulator must have 3 or more front display screens.	Mandatory Requirement
SSS-SIM-2463	Each motion simulator front display screen must be a flat-panel LCD (Liquid Crystal Display) or LED (Light-emitting Diode) display screen.	Mandatory Requirement
SSS-SIM-2464	Each motion simulator front display screen must have display area that is 55 inches or more, diagonally.	Mandatory Requirement
SSS-SIM-132	Each motion simulator front display screen must have a resolution of 1920×1080 (1080p) or more.	Mandatory Requirement
SSS-SIM-2465	Each motion simulator front display screen must have a refresh rate of 60 Hz or more.	Mandatory Requirement
SSS-SIM-154	Each motion simulator front display screen must have a bezel size of 7 mm or less to avoid visual distractions to the operator.	Mandatory Requirement
SSS-SIM-2038	The motion simulator front display screens must have a horizontal Field of View of 135° or more.	Mandatory Requirement
SSS-SIM-150	The motion simulator front display screens must have a vertical Field of View of 45° or more.	Mandatory Requirement
SSS-SIM-135	The motion simulator front display screens must be mounted on a display frame.	Mandatory Requirement
SSS-SIM-2039	The motion simulator front display frame must be able to rotate the front display screens by 90°.	Mandatory Requirement
SSS-SIM-2800	The rotation of the motion simulator front display frame must be done manually, without tools, by one person in 5 min or less.	Mandatory Requirement
SSS-SIM-148	**3.1.1.1.2 Motion Simulator Operator Station Rear Display**	Header
SSS-SIM-140	The motion simulator must have 1 rear display screen.	Mandatory Requirement
SSS-SIM-141	The motion simulator rear display screen must have a display area that is 27 inches or more, diagonally.	Mandatory Requirement
SSS-SIM-2468	The motion simulator rear display screen must be mounted on a display frame.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-155	**3.1.1.2 Motion Simulator Operator Seat Assembly**	Header
SSS-SIM-157	The motion simulator operator seat assembly must have a seat.	Mandatory Requirement
SSS-SIM-2428	The seat must have a headrest with 2 or more adjustable positions.	Mandatory Requirement
SSS-SIM-2429	The seat must have armrests with 2 or more adjustable positions.	Mandatory Requirement
SSS-SIM-2430	The seat height must be adjustable with 2 or more positions.	Mandatory Requirement
SSS-SIM-2431	The seat depth must be adjustable with 2 or more positions.	Mandatory Requirement
SSS-SIM-2040	The seat must be mounted to the motion simulator platform.	Mandatory Requirement
SSS-SIM-156	**3.1.1.3 Motion Simulator Motion System**	Header
SSS-SIM-2802	The motion simulator motion system must provide motion cues to the operator.	Mandatory Requirement
SSS-SIM-2892	The motion simulator motion system should provide **realistic** motion cues to the operator.	Rated Requirement
SSS-SIM-2461	The motion simulatior motion system must synchronize the motion with the visual display of the tasks that are performed.	Mandatory Requirement
SSS-SIM-2462	The motion simulator motion system must pitch the operator seat 7° or more in both directions.	Mandatory Requirement
SSS-SIM-166	The motion simulator motion system must roll the operator seat 10° or more in both directions.	Mandatory Requirement
SSS-SIM-2752	The motion simulator motion system must provide a motion response to collisions.	Mandatory Requirement
SSS-SIM-2753	The motion simulator motion system must provide motion cues associated with the equipment maneuvering with the terrain.	Mandatory Requirement
SSS-SIM-2754	The motion simulator motion system must provide motion cues associated with an unbalanced load.	Mandatory Requirement
SSS-SIM-2801	The motion simulator motion system must provide motion cues associated with equipment tipping.	Mandatory Requirement
SSS-SIM-2756	The motion simulator motion system must provide motion cues associated with equipment vibration.	Mandatory Requirement
SSS-SIM-2757	The motion simulator motion system must provide motion cues associated with the interaction between equipment and objects in the virtual environment.	Mandatory Requirement
SSS-SIM-2103	**3.1.1.4 Motion Simulator Operator Controls**	Header
SSS-SIM-2189	The motion simulator operator control layout and characteristics for dozer, loader, excavator, grader and backhoe must be in accordance with ISO 10968:2004.	Mandatory Requirement
SSS-SIM-2657	The motion simulator operator control layout and characteristics for the all terrain crane cabin must be in accordance with ISO 7752-2: 2011.	Mandatory Requirement
SSS-SIM-2658	The motion simulator operator load handling controls layout and characteristics for the forklift must be in accordance with ISO 10896-1:2012 section 4.5.4.	Mandatory Requirement
SSS-SIM-2700	The motion simulator must replicate the **primary** and **secondary controls** of the equipment being simulated.	Mandatory Requirement
SSS-SIM-2186	The motion simulator **primary controls** must be of the same form and function as those found on the CHER equipment being simulated. (e.g. a joystick must not simulate a steering wheel or vice versa)	Mandatory Requirement
SSS-SIM-2798	The motion simulator **secondary controls** must be of similar form and function as those found on the CHER equipment being simulated.	Mandatory Requirement
SSS-SIM-2845	The motion simulator controls quality, look and feel must be similar to controls found on actual heavy support equipment.	Mandatory Requirement
SSS-SIM-2791	Information about the motion simulator **primary and secondary controls** form and function will be provided by Canada after Contract award.	Information

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2837	The motion simulator **primary** and **secondary** controls must be **hot swappable** from one simulated equipment to another.	Mandatory Requirement
SSS-SIM-2689	The motion simulator instrumentation and controls must be marked in metric units.	Mandatory Requirement
SSS-SIM-2188	The motion simulator controls must have a mechanical life of 5,000,000 cycles or more.	Mandatory Requirement
SSS-SIM-175	The excavator motion simulator operator controls must be able to change from ISO to SAE.	Mandatory Requirement
SSS-SIM-246	**3.1.1.5 Motion Simulator Computer System**	Header
SSS-SIM-247	The motion simulator must have an integrated computer system.	Mandatory Requirement
SSS-SIM-251	The motion simulator computer system must have a shock mount in order to withstand, without damage, the shock and vibration of the motion simulator.	Mandatory Requirement
SSS-SIM-252	The motion simulator computer system must be accessible physically within 5 minutes or less.	Mandatory Requirement
SSS-SIM-248	**3.1.1.6 Motion Simulator Human Machine Interface (HMI)**	Header
SSS-SIM-249	The motion simulator must have a **Human Machine Interface (HMI).**	Mandatory Requirement
SSS-SIM-2090	The motion simulator Human Machine Interface must allow the operator to select between individual HSE training program modules.	Mandatory Requirement
SSS-SIM-2089	The motion simulator Human Machine Interface must have a touch-screen.	Mandatory Requirement
SSS-SIM-258	The motion simulator touch screen must be accessible to a seated operator.	Mandatory Requirement
SSS-SIM-225	**3.1.1.7 Motion Simulator Sound System**	Header
SSS-SIM-226	The motion simulator must have a sound system.	Mandatory Requirement
SSS-SIM-2091	The motion simulator sound system must be a **stereo sound** system.	Mandatory Requirement
SSS-SIM-300	The motion simulator operator station sound system must have speakers.	Mandatory Requirement
SSS-SIM-2482	The motion simulator operator station sound system must have connections for headsets.	Mandatory Requirement
SSS-SIM-2483	The motion simulator operator station sound system must have one or more headsets.	Mandatory Requirement
SSS-SIM-2093	The volume of the operator station sound system must be adjustable by the seated simulator operator.	Mandatory Requirement
SSS-SIM-2230	The volume of the operator station sound system must be mutable by the seated simulator operator.	Mandatory Requirement
SSS-SIM-2015	**3.1.2 Portable Simulator**	Header
SSS-SIM-1893	**3.1.2.1 Portable Simulator Display**	Header
SSS-SIM-2109	The portable simulator must have 1 display screen.	Mandatory Requirement
SSS-SIM-2496	The portable simulator display screen must be a flat-panel LCD or LED display screen.	Mandatory Requirement
SSS-SIM-2497	The portable simulator display screen must have a display area that is 34 inches or more, diagonally.	Mandatory Requirement
SSS-SIM-1911	The portable simulator display screen must have a resolution of 1920×1080 (1080p) or more.	Mandatory Requirement
SSS-SIM-2498	The portable simulator display screen must have a refresh rate of 60 Hz or more.	Mandatory Requirement
SSS-SIM-1914	**3.1.2.2 Portable Simulator Operator Controls**	Header
SSS-SIM-2518	The portable simulator operator controls must have desk mounts.	Mandatory Requirement
SSS-SIM-2519	The portable simulator operator controls desk mounts must be adjustable to fit operators of the size range defined in SSS-SIM-2649.	Mandatory Requirement
SSS-SIM-2521	The portable simulator controls must have a mechanical life of 5,000,000 cycles or more.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2803	The portable simulator must replicate the **primary** and **secondary** controls of the equipment being simulated.	Mandatory Requirement
SSS-SIM-2522	The portable simulator **primary controls** must be of the same form and function as those found on the CHER equipment being simulated (e.g. a joystick must not simulate a steering wheel or vice versa).	Mandatory Requirement
SSS-SIM-2790	The portable simulator **primary controls** form will be confirmed by the TA.	Information
SSS-SIM-2844	The portable simulator controls quality, look and feel must be similar to controls found on real heavy support equipment.	Mandatory Requirement
SSS-SIM-2901	Information about the portable simulator **primary and secondary controls** will be provided by Canada after Contract award.	Information
SSS-SIM-1905	**3.1.2.3 Portable Simulator Computer System**	Header
SSS-SIM-261	The portable simulator must have a portable computer system such as a laptop.	Mandatory Requirement
SSS-SIM-2702	The portable computer system must have ingress protection IP 65 in accordance with IEC 60529.	Mandatory Requirement
SSS-SIM-2703	The portable computer system must meet MIL-STD-810G, method 516.5, for functional shock and transit drop.	Mandatory Requirement
SSS-SIM-2121	The portable simulator computer system must be able to be used as the **Human Machine Interface** (HMI).	Mandatory Requirement
SSS-SIM-2123	**3.1.2.4 Portable Simulator Sound System**	Header
SSS-SIM-2124	The portable simulator must have a sound system.	Mandatory Requirement
SSS-SIM-2541	The portable simulator sound system must have speakers.	Mandatory Requirement
SSS-SIM-2542	The portable simulator sound system must have connections for headsets.	Mandatory Requirement
SSS-SIM-2543	The portable simulator must have headsets.	Mandatory Requirement
SSS-SIM-2544	The volume of the portable simulator sound system must be adjustable by the simulator operator.	Mandatory Requirement
SSS-SIM-2545	The volume of the portable simulator sound system must be mutable by the simulator operator.	Mandatory Requirement
SSS-SIM-2102	**3.1.2.5 Portable Simulator Transportation Cases**	Header
SSS-SIM-2018	Each portable simulator must have one set of purpose-built transportation cases to transport the portable simulators.	Mandatory Requirement
SSS-SIM-2804	The distribution of portable simulator and components between transportation cases must be approved by the TA.	Mandatory Requirement
SSS-SIM-2347	Each transportation case must be able to move in and out of a standard door.	Mandatory Requirement
SSS-SIM-2546	The size of a standard door is 36 inches in width and 8 feet in height.	Information
SSS-SIM-2201	Each transportation case must be constructed of man-made material such as molded plastic.	Mandatory Requirement
SSS-SIM-2202	Each transportation case must have at least two padlockable hasps of 8 mm diameter.	Mandatory Requirement
SSS-SIM-2732	Each transportation case must have latches.	Mandatory Requirement
SSS-SIM-2805	All transportation case latches must be compliant with MIL-C-4150J.	Mandatory Requirement
SSS-SIM-2828	Each transportation case must have cut or molded foam cushions that protect the portable simulator components from shock and vibration.	Mandatory Requirement
SSS-SIM-2223	Each transportation case, with the portable simulator components inside, must be safe to carry by two persons.	Mandatory Requirement
SSS-SIM-2426	The weight of each transportation case, including the portable simulator inside, must weigh 37.2kg or less.	Mandatory Requirement
SSS-SIM-2548	Each transportation case must have carry handles in accordance with MIL-STD-1472G.	Mandatory Requirement
SSS-SIM-2547	Each transportation case weighting 19 kg or more (including the portable simulator) must have two wheels.	Mandatory Requirement
SSS-SIM-2734	Each transportation case weighting 19 kg or more (including the portable simulator) must have an extendable handle.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2203	Each transportation case must have a barometric relief valve as the portable simulator cases will be subject to altitude pressure changes during tactical air transportation or due to abrupt ambient temperature changes.	Mandatory Requirement
SSS-SIM-2827	**3.1.2.5.1 Degree of Protection**	Header
SSS-SIM-2704	Each transportable case must have ingress protection IP67 in accordance with IEC 60529.	Mandatory Requirement
SSS-SIM-2211	**3.1.2.5.2 High Temperature (Storage)**	Header
SSS-SIM-2212	Each transportation case must withstand, without damage, a **storage temperature** of 50° C or warmer.	Mandatory Requirement
SSS-SIM-2213	**3.1.2.5.3 Low Temperature (Storage)**	Header
SSS-SIM-2214	Each transportation case must withstand, without damage, a **storage temperature** of -40° C or colder.	Mandatory Requirement
SSS-SIM-2209	**3.1.2.5.4 Shock (Transit Drop)**	Header
SSS-SIM-2210	Each transportation case must withstand, without damage, the shock induced by road and air transportation in accordance with MIL-STD-810F, method 516.5 Procedure 4 Transit Drop.	Mandatory Requirement
SSS-SIM-269	**3.2 Simulator Instructor Station**	Header
SSS-SIM-270	The simulator instructor station must have 2 display screens or more.	Mandatory Requirement
SSS-SIM-1949	The simulator instructor station must have 1 keyboard or more.	Mandatory Requirement
SSS-SIM-1950	The simulator instructor station must have 1 mouse or more.	Mandatory Requirement
SSS-SIM-2878	One simulator instructor station must control both operation station variants.	Mandatory Requirement
SSS-SIM-2304	**3.3 Simulator Environmental Conditions**	Header
SSS-SIM-2305	The simulator must withstand, without damage, a **storage temperature** of -20° C or colder.	Mandatory Requirement
SSS-SIM-2549	The simulator must withstand, without damage, a **storage temperature** of 45° C or warmer.	Mandatory Requirement
SSS-SIM-2550	The simulator must withstand, without damage, an **operating temperature** of 10° C or colder.	Mandatory Requirement
SSS-SIM-2551	The simulator must withstand, without damage, an **operating temperature** of 40° C or warmer.	Mandatory Requirement
SSS-SIM-2553	The simulator must withstand, without damage, a **storage humidity** of 5% or less non-condensing.	Mandatory Requirement
SSS-SIM-2554	The simulator must withstand, without damage, a **storage humidity** of 95% or more non-condensing.	Mandatory Requirement
SSS-SIM-2555	The simulator must withstand, without damage, an **operating humidity** of 10% or less non-condensing.	Mandatory Requirement
SSS-SIM-2556	The simulator must withstand, without damage, an **operating humidity** of 80% or more non-condensing.	Mandatory Requirement
SSS-SIM-45	**4 SIMULATOR SOFTWARE REQUIREMENTS**	Header
SSS-SIM-1612	The simulator must be delivered with all software necessary to **teach** an operator in a **virtual environment**.	Mandatory Requirement
SSS-SIM-2270	The simulator Software must be in English and French.	Mandatory Requirement
SSS-SIM-2716	**4.1 Simulator Virtual Environment**	Header
SSS-SIM-2705	The simulator software must generate a **virtual environment**.	Mandatory Requirement
SSS-SIM-2710	The **virtual environment** physics must be validated against empirical data.	Mandatory Requirement
SSS-SIM-2768	The **virtual environment dynamics** should be **realistic**.	Rated Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2713	The **virtual environment** must simulate collisions between the simulated equipment and the environment.	Mandatory Requirement
SSS-SIM-2720	The **virtual environmen**t must simulate collisions between simulated equipment components.	Mandatory Requirement
SSS-SIM-2721	The **virtual environmen**t must simulate vibration of the equipment.	Mandatory Requirement
SSS-SIM-2866	The **virtual environment** must simulate deformation of the equipment.	Mandatory Requirement
SSS-SIM-2245	The simulator software must simulate digging and cutting operations performed by the dozer, loader, grader, excavator and backhoe.	Mandatory Requirement
SSS-SIM-2856	The simulator software must simulate a dynamic terrain.	Mandatory Requirement
SSS-SIM-2724	The simulator software must simulate the soil inertial properties and impact vehicle behavior accordingly.	Mandatory Requirement
SSS-SIM-2774	The simulator software must allow for stockpiling to the maximum height equal to the physical capability of the simulated equipment.	Mandatory Requirement
SSS-SIM-1641	**4.2 Simulator Graphics**	Header
SSS-SIM-1618	The simulator software must have a three dimensional graphics.	Mandatory Requirement
SSS-SIM-2893	The simulator software should have **realistic** graphics.	Rated Requirement
SSS-SIM-1620	The simulator software graphics must have an operator field of view based on an existing machine.	Mandatory Requirement
SSS-SIM-2557	The simulator software graphics must have rear mirrors based on an existing machine.	Mandatory Requirement
SSS-SIM-2558	The simulator software graphics must have back-up cameras based on an existing machine.	Mandatory Requirement
SSS-SIM-1621	The simulator software graphics must display the terrain.	Mandatory Requirement
SSS-SIM-1623	The simulator software graphics must have barriers for driving **exercises**.	Mandatory Requirement
SSS-SIM-2234	The simulator software graphics must have indicators for positioning **exercises**.	Mandatory Requirement
SSS-SIM-1624	The simulator software graphics must display an exterior view of the virtual equipment.	Mandatory Requirement
SSS-SIM-2711	The exterior view of the virtual equipment must have enough details and be of enough quality for an operator doing a virtual pre-inspection to be able to identify faults in sub-components (e.g. damaged pulley, oil leak, etc.).	Mandatory Requirement
SSS-SIM-1617	**4.3 Simulator Audio**	Header
SSS-SIM-1626	The simulator software must have sounds that provide aural cues.	Mandatory Requirement
SSS-SIM-2894	The simulator software should have sounds that provide **realistic** aural cues.	Rated Requirement
SSS-SIM-2770	The simulator aural cues must occur in real time.	Mandatory Requirement
SSS-SIM-2773	The simulator aural cues must include interactions between the equipment and the environment.	Mandatory Requirement
SSS-SIM-1627	The simulator aural cues must have engine sounds.	Mandatory Requirement
SSS-SIM-2712	The simulator aural cues must have equipment sounds.	Mandatory Requirement
SSS-SIM-1628	The simulator aural cues must have system alert sounds.	Mandatory Requirement
SSS-SIM-1629	The simulator aural cues must have environment sounds.	Mandatory Requirement
SSS-SIM-1625	**4.4 Simulator Driving**	Header
SSS-SIM-1642	The simulator software must simulate vehicle steering.	Mandatory Requirement
SSS-SIM-1643	The simulator software must simulate vehicle acceleration.	Mandatory Requirement
SSS-SIM-1644	The simulator software must simulate vehicle braking.	Mandatory Requirement
SSS-SIM-2235	The simulator software must simulate friction between the vehicle components and the ground.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2846	The driving of simulated equipment should be **realistic**.	Rated Requirement
SSS-SIM-1633	**4.5 Weather Conditions**	Header
SSS-SIM-2850	The simulator software must simulate dry and sunny weather conditions.	Mandatory Requirement
SSS-SIM-1634	The simulator software must have visual rain effects.	Mandatory Requirement
SSS-SIM-1635	The simulator must have sound for rain.	Mandatory Requirement
SSS-SIM-1636	The simulator must have visual snowfall effects.	Mandatory Requirement
SSS-SIM-1637	The simulator must have visual wind effects.	Mandatory Requirement
SSS-SIM-1638	The simulator must have sound for wind.	Mandatory Requirement
SSS-SIM-2244	**4.6 Soil Conditions**	Header
SSS-SIM-1652	The simulator software must simulate sandy **loam** soil conditions.	Mandatory Requirement
SSS-SIM-2247	The simulator software should simulate digging behaviors under **sand** conditions.	Rated Requirement
SSS-SIM-1653	The simulator software should simulate digging behaviors under **rock** conditions (Loader and Excavator training modules only).	Rated Requirement
SSS-SIM-1648	**4.7 All Terrain Crane Specific Requirements**	Header
SSS-SIM-2730	**4.7.1 Structural dynamics**	Header
SSS-SIM-2731	The simulator must simulate boom deflection while lifting a load.	Mandatory Requirement
SSS-SIM-2822	The simulator must simulate the effects of the outriggers on the stability of the all terrain crane.	Mandatory Requirement
SSS-SIM-2823	The simulator must simulate the effects of the counterweights on the stability and balance of the all terrain crane.	Mandatory Requirement
SSS-SIM-2559	**4.7.2 Wind Effects**	Header
SSS-SIM-2560	The simulator must simulate wind effects on load swing for all terrain cranes.	Mandatory Requirement
SSS-SIM-2561	**4.7.3 All Terrain Crane Hand Signals**	Header
SSS-SIM-2252	The simulator software must have a simulated person who provides hand signals to the all terrain crane simulator operator.	Mandatory Requirement
SSS-SIM-1654	The simulator software must simulate the appropriate hand signals in accordance with page 143 to 147 of "The Complete Rigger's Reference Handbook, Third Edition" by Mike Riggs, published by Source Atlantic.	Mandatory Requirement
SSS-SIM-1658	**4.8 Simulator Management Software**	Header
SSS-SIM-2869	The simulator management software must be run from an instructor station.	Mandatory Requirement
SSS-SIM-2871	The simulator management software must be run from both operator station variants.	Mandatory Requirement
SSS-SIM-2575	**4.8.1 Exercise Selection**	Header
SSS-SIM-1661	The simulator management software must allow the instructor and the operator to select an equipment training program.	Mandatory Requirement
SSS-SIM-2583	The simulator management software must allow the instructor and the operator to end an equipment training program.	Mandatory Requirement
SSS-SIM-2567	The simulator management software must allow the instructor and operator to select an equipment training module.	Mandatory Requirement
SSS-SIM-2584	The simulator management software must allow the instructor and operator to end an equipment training module.	Mandatory Requirement
SSS-SIM-2566	The simulator management software must allow the instructor and operator to choose different weather conditions.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2576	**4.8.2 Account Management**	Header
SSS-SIM-2570	The simulator management software must allow the instructor to manage multiple user accounts.	Mandatory Requirement
SSS-SIM-2830	The user accounts must be transferable from one operator station to another.	Mandatory Requirement
SSS-SIM-1669	The simulator management software must allow the instructor to add a new account.	Mandatory Requirement
SSS-SIM-2571	The simulator management software must allow the instructor to remove or deactivate an account.	Mandatory Requirement
SSS-SIM-1664	The simulator management software must log in students for training.	Mandatory Requirement
SSS-SIM-2255	The simulator management software must log out students for training.	Mandatory Requirement
SSS-SIM-2581	**4.8.3 Performance Management**	Header
SSS-SIM-2787	The simulator management software must allow the instructor to do **performance management** of the operator.	Mandatory Requirement
SSS-SIM-2896	The simulator management software must allow the operator to do their own **performance management**.	Mandatory Requirement
SSS-SIM-2746	The simulator management software must allow the instructor to view the simulation exercise from multiple viewpoints, in real time.	Mandatory Requirement
SSS-SIM-2779	**4.8.3.1 Performance Monitoring**	Header
SSS-SIM-2582	The simulator management software must monitor the performance of the operators through **key performance metrics**.	Mandatory Requirement
SSS-SIM-2709	The simulator management software must identify key areas to improve the performance of the operator.	Mandatory Requirement
SSS-SIM-2750	The simulator management software must provide immediate feedback to operators for incorrect procedures.	Mandatory Requirement
SSS-SIM-2767	The simulator management software must provide immediate feedback to the instructor for incorrect operating procedures performed by the operator.	Mandatory Requirement
SSS-SIM-2883	**4.8.3.1.1 Leaderboard**	Header
SSS-SIM-2708	The simulator management software must rank the performance of the operators against each other on a **leaderboard**.	Mandatory Requirement
SSS-SIM-2808	The **leaderboard** must be able to be viewed by the operators.	Mandatory Requirement
SSS-SIM-2577	**4.8.3.2 Record Management**	Header
SSS-SIM-1665	The simulator management software must save training results.	Mandatory Requirement
SSS-SIM-1666	The simulator management software must maintain a database of training results based on **key performance metrics** to track the progress of the operators.	Mandatory Requirement
SSS-SIM-1667	The simulator management software must allow the user to analyze training results.	Mandatory Requirement
SSS-SIM-2354	The simulator management software must print training results.	Mandatory Requirement
SSS-SIM-2811	Training results must be linked to a student record.	Mandatory Requirement
SSS-SIM-2758	**4.8.3.3 After Action Review**	Header
SSS-SIM-2759	The simulator management software must have the ability to review completed training exercises through an **After Action Review** (AAR).	Mandatory Requirement
SSS-SIM-2763	The AAR must have the ability to replay the training exercise.	Mandatory Requirement
SSS-SIM-2764	The AAR must have the ability to start, stop, rewind, fast forward, pause, zoom in and zoom out.	Mandatory Requirement
SSS-SIM-2760	The AAR must not interfere with on-going training being performed by other operators.	Mandatory Requirement
SSS-SIM-2810	The simulator management software must export the AAR in a video format to a USB memory stick.	Option

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2814	**4.9 Networked Virtual Environment**	Header
SSS-SIM-2816	The simulator software should generate a networked virtual environment that allows two operator stations or more to interact during a scenario.	Rated Requirement
SSS-SIM-314	**5 TRAINING PROGRAM**	Header
SSS-SIM-2264	The simulator system must have a **training program**.	Mandatory Requirement
SSS-SIM-2585	The training program must enable **autonomous learning**.	Mandatory Requirement
SSS-SIM-2902	The training program **should** receive a score of 90% or more for "autonomous learning" when tested IAW Test Profile X in Vol 1, part 4. (test profile to be published)	Rated Requirement
SSS-SIM-2591	The training program must be **progressive**.	Mandatory Requirement
SSS-SIM-2903	The training program **should** receive a score of 90% or more for "progressive training" when tested IAW Test Profile X in Vol 1, part 4XX.	Rated Requirement
SSS-SIM-2885	All training program modules must be integrated into a single training program.	Mandatory Requirement
SSS-SIM-2890	All **training program** modules must be integrated with the simulator management software.	Mandatory Requirement
SSS-SIM-2747	**5.1 Language**	Header
SSS-SIM-2265	The training programs must be in English and French.	Mandatory Requirement
SSS-SIM-233	**5.2 Backhoe Training Program Requirements**	Header
SSS-SIM-511	The Simulator must have a program that simulates a backhoe.	Mandatory Requirement
SSS-SIM-512	A "backhoe" is defined as a self-propelled wheeled machine having a main frame designed for front mounted attachments, which loads or excavates through forward motion of the machine, and rear mounted attachments, which digs below ground level.	Information
SSS-SIM-1094	The simulated backhoe must be based on an existing backhoe with **net power** of 80 kW or more.	Mandatory Requirement
SSS-SIM-1089	**5.2.1 Backhoe Training Module**	Header
SSS-SIM-1092	The simulator backhoe program must have a training module.	Mandatory Requirement
SSS-SIM-1093	The simulator backhoe training module must have **exercises** to **teach** a backhoe operator.	Mandatory Requirement
SSS-SIM-1113	The simulator backhoe training module must have **exercises** to **test** a backhoe operator.	Mandatory Requirement
SSS-SIM-1129	The grouping and sequencing of the backhoe training module **exercises** are at the Contractor's discretion.	Information
SSS-SIM-326	**5.2.1.1 Pre-operational Inspection Exercises**	Header
SSS-SIM-519	The simulator backhoe training module must have **exercises** to **teach** the operator to conduct pre-operational inspection.	Mandatory Requirement
SSS-SIM-377	The simulator backhoe training module must have **exercises** to **test** the operator on pre-operational inspection.	Mandatory Requirement
SSS-SIM-1063	The simulator backhoe training module pre-operational inspection exercises must have **exercises** to **test** the operator on randomized equipment faults.	Mandatory Requirement
SSS-SIM-327	**5.2.1.2 Control Exercises**	Header
SSS-SIM-1111	The simulator backhoe training module must have **exercises** to **teach** the operator to operate a single control or a few controls of the machine, such as a button, a joystick, a pedal, a steering wheel, or a touchpad for machine interface.	Mandatory Requirement
SSS-SIM-343	The simulator backhoe training module control exercises must include all controls used in any of the simulator backhoe training module.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-449	**5.2.1.3 Positioning Exercises**	Header
SSS-SIM-381	**5.2.1.3.1 Driving Forward Exercises**	Header
SSS-SIM-1118	The simulator backhoe training module must have **exercises** to **teach** the operator to drive the backhoe forward.	Mandatory Requirement
SSS-SIM-454	The simulator backhoe training module forward driving module must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1123	The simulator backhoe training module forward driving exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-383	**5.2.1.3.2 Driving Backward Exercises**	Header
SSS-SIM-1124	The simulator backhoe training module must have **exercises** to **teach** the operator to drive the backhoe backward.	Mandatory Requirement
SSS-SIM-1132	The simulator backhoe training module backward driving module must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1134	The simulator backhoe training module backward driving exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-385	**5.2.1.3.3 Maneuvering Exercises**	Header
SSS-SIM-386	The simulator backhoe training module must have **exercises** to **teach** the operator to drive the backhoe in directions requiring switching between forward and backward driving.	Mandatory Requirement
SSS-SIM-1101	The simulator backhoe training module maneuvering exercises must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1136	The simulator backhoe training module maneuvering exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-528	The simulator backhoe training module maneuvering exercises must have **exercises** to **teach** the operator to park the backhoe within a designated area.	Mandatory Requirement
SSS-SIM-1137	The simulator backhoe training module maneuvering exercises must have **exercises** to **test** the operator on parking the backhoe within a designated area.	Mandatory Requirement
SSS-SIM-387	**5.2.1.3.4 Loader Bucket Positioning Exercises**	Header
SSS-SIM-1102	The loader bucket is mounted on the front of the backhoe.	Information
SSS-SIM-1114	The simulator backhoe training module must have **exercises** to **teach** the operator to control the loader bucket by moving along a path.	Mandatory Requirement
SSS-SIM-1138	The simulator backhoe training module loader bucket positioning exercises must have training **exercises** consisting of multiple paths that the operator has to move the loader bucket along.	Mandatory Requirement
SSS-SIM-1140	The simulator backhoe training module loader bucket positioning exercises must have **exercises** to **test** the operator on moving the loader bucket within the boundaries of a path.	Mandatory Requirement
SSS-SIM-1139	The simulator backhoe training module loader bucket positioning exercises must have **exercises** to **teach** the operator to position the loader bucket within a designated area.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1141	The simulator backhoe training module loader bucket positioning exercises must have **exercises** to **test** the operator on positioning the loader bucket within a designated area.	Mandatory Requirement
SSS-SIM-1103	**5.2.1.3.5 Excavator Bucket Positioning Exercises**	Header
SSS-SIM-1104	The backhoe excavator bucket is mounted on the rear of the backhoe.	Information
SSS-SIM-1115	The simulator backhoe training module must have **exercises** to **teach** the operator to control the excavator bucket by moving along a path.	Mandatory Requirement
SSS-SIM-1142	The simulator backhoe training module excavator bucket positioning exercises must have training **exercises** consisting of multiple paths that the operator has to move the excavator bucket along.	Mandatory Requirement
SSS-SIM-1144	The simulator backhoe training module excavator bucket positioning exercises must have **exercises** to **test** the operator on moving the excavator bucket within the boundaries of a path.	Mandatory Requirement
SSS-SIM-1143	The simulator backhoe training module excavator bucket positioning exercises must have **exercises** to **teach** the operator to position the excavator bucket within a designated area.	Mandatory Requirement
SSS-SIM-1145	The simulator backhoe training module excavator bucket positioning exercises must have **exercises** to **test** the operator on positioning the excavator bucket within a designated area.	Mandatory Requirement
SSS-SIM-391	**5.2.1.3.6 Driving the Backhoe on a Trailer Exercises**	Header
SSS-SIM-393	The simulator backhoe training module must have **exercises** to **teach** the operator to drive the backhoe onto a trailer.	Mandatory Requirement
SSS-SIM-1148	The simulator backhoe training module driving the backhoe on a trailer **exercises** must include all safety considerations.	Mandatory Requirement
SSS-SIM-394	The simulator backhoe training module driving the backhoe on a trailer exercises must have **exercises** to **teach** the operator to position the backhoe on a trailer.	Mandatory Requirement
SSS-SIM-1108	The simulator backhoe training module driving the backhoe on a trailer exercises must have **exercises** to **test** the operator on positioning the backhoe within the trailer boundaries.	Mandatory Requirement
SSS-SIM-395	The simulator backhoe training module driving the backhoe on a trailer exercises must have **exercises** to **teach** the operator to secure the backhoe on the trailer using simulated chains and tie downs.	Mandatory Requirement
SSS-SIM-396	The simulator backhoe training module driving the backhoe on a trailer exercises must have **exercises** to **teach** the operator to unsecure the backhoe using simulated chains and tie downs.	Mandatory Requirement
SSS-SIM-1126	The simulator backhoe training module driving the backhoe on a trailer exercises must have **exercises** to **teach** the operator to drive the backhoe off a trailer.	Mandatory Requirement
SSS-SIM-474	**5.2.1.4 Backhoe Task Exercises**	Header
SSS-SIM-469	**5.2.1.4.1 Loading Using the Loader Bucket Exercises**	Header
SSS-SIM-470	The simulator backhoe training module must have **exercises** to **teach** the operator to perform loading operations, using the loader bucket.	Mandatory Requirement
SSS-SIM-473	The simulator backhoe training module must have **exercises** to **teach** the operator to carry material from a pile to a designated area on the ground, using the loader bucket.	Mandatory Requirement
SSS-SIM-471	The simulator backhoe training module must have **exercises** to **teach** the operator to fill a trench, using the loader bucket.	Mandatory Requirement
SSS-SIM-477	The simulator backhoe training module must have **exercises** to **teach** the operator to level a designated area, using the loader bucket.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-534	The simulator backhoe training module must have **exercises** to **teach** the operators to unload the removed material to a truck, using the loader bucket.	Mandatory Requirement
SSS-SIM-461	**5.2.1.4.2 Excavating Using the Excavator Arm Exercises**	Header
SSS-SIM-463	The simulator backhoe training module must have **exercises** to **teach** the operator to perform digging operations, using the excavator arm.	Mandatory Requirement
SSS-SIM-415	The simulator backhoe training module must have **exercises** to **teach** the operator to dig a trench with a flat bottom according to specifications, using the excavator arm.	Mandatory Requirement
SSS-SIM-530	The simulator backhoe training module must have **exercises** to **teach** the operator to unload the removed material in a designated area on the ground, using the excavator arm.	Mandatory Requirement
SSS-SIM-533	The simulator backhoe training module must have **exercises** to **teach** the operator to unload the removed material to a dump truck, using the excavator arm.	Mandatory Requirement
SSS-SIM-491	**5.2.1.5 Load Handling Using Attachments Exercises (Option)**	Header
SSS-SIM-438	The simulator backhoe training module must have **exercises** to **teach** the operator to operate forks.	Option
SSS-SIM-475	**5.2.1.6 Standard Military Testing Exercises (Option)**	Header
SSS-SIM-479	The simulator backhoe training module must have **exercises** to **test** the operator on roughly leveling an area of 10m^2 within ten (10) minutes.	Option
SSS-SIM-481	The simulator backhoe training module must have **exercises** to **test** the operator on loading and hauling for 30m travel distance (one way), delivering a total of 10m^3 of material within ten (10) minutes.	Option
SSS-SIM-537	The simulator backhoe training module must have **exercises** to **test** the operator on filling a ditch 3m L x 2m D x 4m L within five (5) minutes.	Option
SSS-SIM-1091	**5.2.2 Backhoe Sandbox Module (Option)**	Header
SSS-SIM-1150	The simulator backhoe program must have a sandbox module.	Option
SSS-SIM-1149	The simulator backhoe sandbox module must allow the operator to have the freedom to experiment with the backhoe operation in a realistic virtual environment.	Option
SSS-SIM-2593	The simulator backhoe sandbox module must have **exercises** to teach all safety considerations.	Option
SSS-SIM-2592	The simulator backhoe sandbox module must have **exercises** to allow the operator to fill in a trench using the loader bucket with customized trench dimensions (length, width and depth).	Option
SSS-SIM-2601	The simulator backhoe sandbox module must have exercises to allow the operator to excavate using the excavator arm with customized trench dimensions (length, width and depth).	Option
SSS-SIM-1151	**5.3 Loader Program Requirements**	Header
SSS-SIM-1152	The Simulator must have a program that simulates a loader.	Mandatory Requirement
SSS-SIM-1153	A "loader" is defined as a self-propelled articulating wheeled machine having front mounted attachments which loads or excavates through forward motion of the machine.	Information
SSS-SIM-2420	The simulated loader must be based on an existing wheel loader with **net power** of 140 KW or more.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1155	**5.3.1 Loader Training Module**	Header
SSS-SIM-1156	The simulator loader program must have a training module.	Mandatory Requirement
SSS-SIM-1157	The simulator loader training module must have **exercises** to **teach** a loader operator.	Mandatory Requirement
SSS-SIM-1158	The simulator loader training module must have **exercises** to **test** a loader operator.	Mandatory Requirement
SSS-SIM-1159	The grouping and sequencing of the loader training module **exercises** are at the Contractor's discretion.	Information
SSS-SIM-1160	**5.3.1.1 Pre-operational Inspection Exercises**	Header
SSS-SIM-1161	The simulator loader training module must have **exercises** to **teach** the operator to conduct pre-operational inspection.	Mandatory Requirement
SSS-SIM-1162	The simulator loader training module must have **exercises** to **test** the operator on pre-operational inspection.	Mandatory Requirement
SSS-SIM-1163	The simulator loader training module pre-operational inspection exercises must have **exercises** to **test** the operator on randomized equipment faults.	Mandatory Requirement
SSS-SIM-1164	**5.3.1.2 Control Exercises**	Header
SSS-SIM-1165	The simulator loader training module must have **exercises** to **teach** the operator to operate a single control or a few controls of the machine, such as a button, a joystick, a pedal, a steering wheel, or a touchpad for machine interface.	Mandatory Requirement
SSS-SIM-1167	The simulator loader training module control exercises must include all controls used in any of the simulator loader training module.	Mandatory Requirement
SSS-SIM-1168	**5.3.1.3 Positioning Exercises**	Header
SSS-SIM-1169	**5.3.1.3.1 Driving Forward Exercises**	Header
SSS-SIM-1170	The simulator loader training module must have **exercises** to **teach** the operator to drive the loader forward.	Mandatory Requirement
SSS-SIM-1171	The simulator loader training module driving forward module must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1172	The simulator loader training module driving forward exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1175	**5.3.1.3.2 Driving Backward Exercises**	Header
SSS-SIM-1176	The simulator loader training module must have **exercises** to **teach** the operator to drive the loader backward.	Mandatory Requirement
SSS-SIM-1177	The simulator loader training module driving backward module must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1178	The simulator loader training module driving backward exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1179	The simulator loader training module driving backward exercises must have **exercises** to **teach** the operator to park the loader within a designated area.	Mandatory Requirement
SSS-SIM-1180	The simulator loader training module driving backward exercises must have **exercises** to **test** the operator on parking within a designated area.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1181	**5.3.1.3.3 Maneuvering Exercises**	Header
SSS-SIM-1182	The simulator loader training module must have **exercises** to **teach** the operator to drive the loader in directions requiring switching between forward and backward driving.	Mandatory Requirement
SSS-SIM-1183	The simulator loader training module maneuvering exercises must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1184	The simulator loader training module maneuvering exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1185	The simulator loader training module maneuvering exercises must have **exercises** to **teach** the operator to park the loader within a designated area.	Mandatory Requirement
SSS-SIM-1186	The simulator loader training module maneuvering exercises must have **exercises** to **test** the operator on parking the loader within a designated area.	Mandatory Requirement
SSS-SIM-1187	**5.3.1.3.4 Bucket Positioning Exercises**	Header
SSS-SIM-1189	The simulator loader training module must have **exercises** to **teach** the operator to control the bucket.	Mandatory Requirement
SSS-SIM-1190	The simulator loader training module bucket positioning exercises must have training **exercises** consisting of multiple paths that the operator has to move the bucket along.	Mandatory Requirement
SSS-SIM-1191	The simulator loader training module bucket positioning exercises must have **exercises** to **test** the operator on moving the bucket within the boundaries of a path.	Mandatory Requirement
SSS-SIM-1192	The simulator loader training module bucket positioning exercises must have **exercises** to **teach** the operator to position the bucket within a designated area.	Mandatory Requirement
SSS-SIM-1193	The simulator loader training module bucket positioning exercises must have **exercises** to **test** the operator on positioning the bucket within a designated area.	Mandatory Requirement
SSS-SIM-1201	**5.3.1.3.5 Driving the Loader on a Trailer Exercises**	Header
SSS-SIM-1202	The simulator loader training module must have **exercises** to **teach** the operator to drive the loader onto a trailer.	Mandatory Requirement
SSS-SIM-1203	The simulator loader training module driving the loader on a trailer **exercises** must include all safety considerations.	Mandatory Requirement
SSS-SIM-1204	The simulator loader training module driving the loader on a trailer exercises must have **exercises** to **teach** the operator to position the loader on a trailer.	Mandatory Requirement
SSS-SIM-1205	The simulator loader training module driving the loader on a trailer exercises must have **exercises** to **test** the operator on positioning the loader within the trailer boundaries.	Mandatory Requirement
SSS-SIM-1206	The simulator loader training module driving the loader on a trailer exercises must have **exercises** to **teach** the operator to secure the loader on the trailer using simulated chains and tie downs.	Mandatory Requirement
SSS-SIM-1207	The simulator loader training module driving the loader on a trailer exercises must have **exercises** to **teach** the operator to unsecure the loader using simulated chains and tie downs.	Mandatory Requirement
SSS-SIM-1208	The simulator loader training module driving the loader on a trailer exercises must have **exercises** to **teach** the operator to drive the loader off a trailer.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1211	**5.3.1.3.6 Not Used**	Header
SSS-SIM-1212	This section is not used.	Information
SSS-SIM-1213	**5.3.1.4 Loader Task Exercises**	Header
SSS-SIM-1215	The simulator loader training module must have **exercises** to **teach** the operator to perform loading operations.	Mandatory Requirement
SSS-SIM-1216	The simulator loader training module must have **exercises** to **teach** the operator to carry material from a pile to a designated area on the ground.	Mandatory Requirement
SSS-SIM-1242	The simulator loader training module must have **exercises** to **teach** the operator to excavate a designated area.	Mandatory Requirement
SSS-SIM-1219	The simulator loader training module must have **exercises** to **teach** the operator to level a designated area.	Mandatory Requirement
SSS-SIM-1217	The simulator loader training module must have **exercises** to **teach** the operator to fill a trench.	Mandatory Requirement
SSS-SIM-1220	The simulator loader training module must have **exercises** to **teach** the operators to unload the removed material to a dump truck.	Mandatory Requirement
SSS-SIM-1227	**5.3.1.5 Load Handling Using Attachments Exercises (Option)**	Header
SSS-SIM-1229	The simulator loader training module must have **exercises** to **teach** the operator to operate a fork.	Option
SSS-SIM-1234	**5.3.1.6 Standard Military Testing Exercises (Option)**	Header
SSS-SIM-1235	The simulator loader training module must have **exercises** to **test** the operator on roughly leveling an area of 10m^2 within ten (10) minutes.	Option
SSS-SIM-1236	The simulator loader training module must have **exercises** to **test** the operator on loading and hauling for 30m travel distance (one way), delivering a total of 40m^3 of material within fifteen (15) minutes.	Option
SSS-SIM-1237	The simulator loader training module must have **exercises** to **test** the operator on loading dump trucks from a stock pile at a rate of 30m^3 within ten (10) minutes.	Option
SSS-SIM-1238	**5.3.2 Loader Sandbox Module (Option)**	Header
SSS-SIM-1239	The simulator loader program must have a sandbox module.	Option
SSS-SIM-1240	The simulator loader sandbox module must allow the operator to have the freedom to experiment with the loader operation in a realistic virtual environment.	Option
SSS-SIM-2594	The simulator loader sandbox module must have **exercises** to teach all safety considerations.	Option
SSS-SIM-2631	The simulator loader sandbox module must have **exercises** to allow the operator to fill in a trench with customized trench dimensions (length, width and depth).	Option
SSS-SIM-1243	**5.4 Dozer Program Requirements**	Header
SSS-SIM-1244	The Simulator must have a program that simulates a dozer.	Mandatory Requirement
SSS-SIM-1245	A "dozer" is defined as a self-propelled tracked machine having dozing attachment which cuts, moves and grades material through forward motion of the machine and a mounted attachment used to exert a push or pull force.	Information
SSS-SIM-2421	The simulated dozer must be based on an existing dozer with net power of 150 KW or more.	Mandatory Requirement
SSS-SIM-1247	**5.4.1 Dozer Training Module**	Header
SSS-SIM-1248	The simulator dozer program must have a training module.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1249	The simulator dozer training module must have **exercises** to **teach** a dozer operator.	Mandatory Requirement
SSS-SIM-1250	The simulator dozer training module must have **exercises** to **test** a dozer operator.	Mandatory Requirement
SSS-SIM-1251	The grouping and sequencing of the dozer training module **exercises** are at the Contractor's discretion.	Information
SSS-SIM-1252	**5.4.1.1 Pre-operational Inspection Exercises**	Header
SSS-SIM-1253	The simulator dozer training module must have **exercises** to **teach** the operator to conduct pre-operational inspection.	Mandatory Requirement
SSS-SIM-1254	The simulator dozer training module must have **exercises** to **test** the operator on pre-operational inspection.	Mandatory Requirement
SSS-SIM-1255	The simulator dozer training module pre-operational inspection exercises must have **exercises** to **test** the operator on randomized equipment faults.	Mandatory Requirement
SSS-SIM-1256	**5.4.1.2 Control Exercises**	Header
SSS-SIM-1257	The simulator dozer training module must have **exercises** to **teach** the operator to operate a single control or a few controls of the machine, such as a button, a joystick, a pedal, or a touchpad for machine interface.	Mandatory Requirement
SSS-SIM-1259	The simulator dozer training module control exercises must include all controls used in any of the simulator dozer training module.	Mandatory Requirement
SSS-SIM-1260	**5.4.1.3 Positioning Exercises**	Header
SSS-SIM-1261	**5.4.1.3.1 Driving Forward Exercises**	Header
SSS-SIM-1262	The simulator dozer training module must have **exercises** to **teach** the operator to drive the dozer forward.	Mandatory Requirement
SSS-SIM-1263	The simulator dozer training module driving forward module must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1264	The simulator dozer training module driving forward exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1267	**5.4.1.3.2 Driving Backward Exercises**	Header
SSS-SIM-1268	The simulator dozer training module must have **exercises** to **teach** the operator to drive the dozer backward.	Mandatory Requirement
SSS-SIM-1269	The simulator dozer training module driving backward module must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1270	The simulator dozer training module driving backward exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1273	**5.4.1.3.3 Maneuvering Exercises**	Header
SSS-SIM-1274	The simulator dozer training module must have **exercises** to **teach** the operator to drive the dozer in directions requiring switching between forward and backward driving.	Mandatory Requirement
SSS-SIM-1275	The simulator dozer training module maneuvering exercises must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1276	The simulator dozer training module maneuvering exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1277	The simulator dozer training module maneuvering exercises must have **exercises** to **teach** the operator to park the dozer within a designated area.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1278	The simulator dozer training module maneuvering exercises must have **exercises** to **test** the operator on parking the dozer within a designated area.	Mandatory Requirement
SSS-SIM-1279	**5.4.1.3.4 Blade Positioning Exercises**	Header
SSS-SIM-1280	The simulator dozer training module must have **exercises** to **teach** the operator to control the blade.	Mandatory Requirement
SSS-SIM-1281	The simulator dozer training module blade positioning exercises must have training **exercises** consisting of multiple paths that the operator has to move the blade along.	Mandatory Requirement
SSS-SIM-1282	The simulator dozer training module blade positioning exercises must have **exercises** to **test** the operator on moving the blade within the boundaries of a path.	Mandatory Requirement
SSS-SIM-1283	The simulator dozer training module blade positioning exercises must have **exercises** to **teach** the operator to position the blade within a designated area.	Mandatory Requirement
SSS-SIM-1284	The simulator dozer training module blade positioning exercises must have **exercises** to **test** the operator on positioning the blade within a designated area.	Mandatory Requirement
SSS-SIM-1285	**5.4.1.3.5 Driving the Dozer on a Trailer Exercises**	Header
SSS-SIM-1286	The simulator dozer training module must have **exercises** to **teach** the operator to drive the dozer onto a trailer.	Mandatory Requirement
SSS-SIM-1287	The simulator dozer training module driving the dozer on a trailer **exercises** must include all safety considerations.	Mandatory Requirement
SSS-SIM-1288	The simulator dozer training module driving the dozer on a trailer exercises must have **exercises** to **teach** the operator to position the dozer on a trailer.	Mandatory Requirement
SSS-SIM-1289	The simulator dozer training module driving the dozer on a trailer exercises must have **exercises** to **test** the operator on positioning the dozer within the trailer boundaries.	Mandatory Requirement
SSS-SIM-1290	The simulator dozer training module driving the dozer on a trailer exercises must have **exercises** to **teach** the operator to secure the dozer on the trailer using simulated chains and tie downs.	Mandatory Requirement
SSS-SIM-1291	The simulator dozer training module driving the dozer on a trailer exercises must have **exercises** to **teach** the operator to unsecure the dozer using simulated chains and tie downs.	Mandatory Requirement
SSS-SIM-1292	The simulator dozer training module driving the dozer on a trailer exercises must have **exercises** to **teach** the operator to drive the dozer off a trailer.	Mandatory Requirement
SSS-SIM-1295	**5.4.1.3.6 Perform Self-recovery Exercises (Option)**	Header
SSS-SIM-1296	The simulator dozer training module must have **exercises** to **teach** the operator to perform dozer **self-recovery** training using the winch.	Option
SSS-SIM-1297	**5.4.1.4 Dozer Task Exercises**	Header
SSS-SIM-1298	The simulator dozer training module must have **exercises** to **teach** the operator to perform dozer tasks.	Mandatory Requirement
SSS-SIM-1302	The simulator dozer training module must have **exercises** to **teach** the operator to level a designated area.	Mandatory Requirement
SSS-SIM-1303	The simulator dozer training module must have **exercises** to **teach** the operator to fill a trench.	Mandatory Requirement
SSS-SIM-1316	The simulator dozer training module must have **exercises** to **teach** the operator to perform cut and fill.	Mandatory Requirement
SSS-SIM-1317	The simulator dozer training module must have **exercises** to **teach** the operator to create a stockpile.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1300	The simulator dozer training module must have **exercises** to **teach** the operator to construct a road by excavating material and forming a road to a specific angle.	Mandatory Requirement
SSS-SIM-1301	The simulator dozer training module must have **exercises** to **teach** the operator to construct a road by performing a side hill cut.	Mandatory Requirement
SSS-SIM-1305	The simulator dozer training module must have **exercises** to **teach** the operator to lift or drag a single obstacle.	Mandatory Requirement
SSS-SIM-1306	**5.4.1.5 Ripper Attachment Exercises (Option)**	Header
SSS-SIM-1308	The simulator dozer training module must have **exercises** to **teach** the operator to use a ripping attachment to loosen material.	Option
SSS-SIM-1309	**5.4.1.6 Standard Military Testing Exercises (Option)**	Header
SSS-SIM-1310	The simulator dozer training module must have **exercises** to **test** the operator on roughly leveling an area of 50m^2 within ten (10) minutes.	Option
SSS-SIM-1325	The simulator dozer training module must have **exercises** to **test** the operator on creating a trafficable lane 3m L x 2m H x 4m W within five (5) minutes.	Option
SSS-SIM-1326	The simulator dozer training module must have **exercises** to **test** the operator on filling a ditch 3m L x 2m D x 4m L within five (5) minutes.	Option
SSS-SIM-2738	The simulator dozer training module must have **exercises** to **test** the operator to create a ditch 70m L x 3.5m W x 1.5m D with two dozers using T-push method within 100 minutes.	Option
SSS-SIM-1313	**5.4.2 Dozer Sandbox Module (Option)**	Header
SSS-SIM-1314	The simulator dozer program must have a sandbox module.	Option
SSS-SIM-1315	The simulator dozer sandbox module must allow the operator to have the freedom to experiment with the dozer operation in a **realistic** virtual environment.	Option
SSS-SIM-2595	The simulator dozer sandbox module must have **exercises** to teach all safety considerations.	Option
SSS-SIM-2600	The simulator dozer sandbox module must have **exercises** to allow the operator to fill in a trench with customized trench dimensions (length, width and depth).	Option
SSS-SIM-1327	**5.5 Excavator Program Requirements**	Header
SSS-SIM-1328	The simulator must have a program that simulates an excavator.	Mandatory Requirement
SSS-SIM-1329	An "excavator" is defined as a self-propelled tracked machine with an upper structure capable of 360° swing with mounted buckets designed for excavating earth without moving the undercarriage.	Information
SSS-SIM-2422	The simulated excavator must be based on an existing excavator with net power of 120 KW or more.	Mandatory Requirement
SSS-SIM-1331	**5.5.1 Excavator Training Module**	Header
SSS-SIM-1332	The simulator excavator program must have a training module.	Mandatory Requirement
SSS-SIM-1333	The simulator excavator training module must have **exercises** to **teach** an excavator operator.	Mandatory Requirement
SSS-SIM-1334	The simulator excavator training module must have **exercises** to **test** an excavator operator.	Mandatory Requirement
SSS-SIM-1335	The grouping and sequencing of the excavator training module **exercises** are at the Contractor's discretion.	Information
SSS-SIM-1336	**5.5.1.1 Pre-operational Inspection Exercises**	Header
SSS-SIM-1337	The simulator excavator training module must have **exercises** to **teach** the operator to conduct pre-operational inspection.	Mandatory Requirement
SSS-SIM-1338	The simulator excavator training module must have **exercises** to **test** the operator on pre-operational inspection.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1339	The simulator excavator training module pre-operational inspection exercises must have **exercises** to **test** the operator on randomized equipment faults.	Mandatory Requirement
SSS-SIM-1340	**5.5.1.2 Control Exercises**	Header
SSS-SIM-1341	The simulator excavator training module must have **exercises** to **teach** the operator to operate a single control or a few controls of the machine, such as a button, a joystick, a pedal, or a touchpad for machine interface.	Mandatory Requirement
SSS-SIM-1343	The simulator excavator training module control exercises must include all controls used in any of the simulator excavator training module.	Mandatory Requirement
SSS-SIM-1344	**5.5.1.3 Positioning Exercises**	Header
SSS-SIM-1345	**5.5.1.3.1 Driving Forward Exercises**	Header
SSS-SIM-1346	The simulator excavator training module must have **exercises** to **teach** the operator to drive the excavator forward.	Mandatory Requirement
SSS-SIM-1347	The simulator excavator training module driving forward module must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1348	The simulator excavator training module driving forward exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1351	**5.5.1.3.2 Driving Backward Exercises**	Header
SSS-SIM-1352	The simulator excavator training module must have **exercises** to **teach** the operator to drive the excavator backward.	Mandatory Requirement
SSS-SIM-1353	The simulator excavator training module driving backward module must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1354	The simulator excavator training module driving backward exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1357	**5.5.1.3.3 Maneuvering Exercises**	Header
SSS-SIM-1358	The simulator excavator training module must have **exercises** to **teach** the operator to drive the excavator in directions requiring switching between forward and backward driving.	Mandatory Requirement
SSS-SIM-1359	The simulator excavator training module maneuvering exercises must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1360	The simulator excavator training module maneuvering exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1361	The simulator excavator training module maneuvering exercises must have **exercises** to **teach** the operator to park the excavator within a designated area.	Mandatory Requirement
SSS-SIM-1362	The simulator excavator training module maneuvering exercises must have **exercises** to **test** the operator on parking the excavator within a designated area.	Mandatory Requirement
SSS-SIM-1363	**5.5.1.3.4 Bucket Positioning Exercises**	Header
SSS-SIM-1365	The simulator excavator training module must have **exercises** to **teach** the operator to control the bucket.	Mandatory Requirement
SSS-SIM-1366	The simulator excavator training module must have training **exercises** consisting of multiple paths that the operator has to move the bucket along.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1367	The simulator excavator training module must have **exercises** to **test** the operator on moving the bucket within the boundaries of a path.	Mandatory Requirement
SSS-SIM-1368	The simulator excavator training module must have **exercises** to **teach** the operator to position the bucket within a designated area.	Mandatory Requirement
SSS-SIM-1369	The simulator excavator training module must have **exercises** to **test** the operator on positioning the bucket within a designated area.	Mandatory Requirement
SSS-SIM-1377	**5.5.1.3.5 Driving the Excavator on a Trailer Exercises**	Header
SSS-SIM-1378	The simulator excavator training module must have **exercises** to **teach** the operator to drive the excavator onto a trailer.	Mandatory Requirement
SSS-SIM-1379	The simulator excavator training module driving the excavator on a trailer **exercises** must include all safety considerations.	Mandatory Requirement
SSS-SIM-1380	The simulator excavator training module driving the excavator on a trailer exercises must have **exercises** to **teach** the operator to position the excavator on a trailer.	Mandatory Requirement
SSS-SIM-1381	The simulator excavator training module driving the excavator on a trailer exercises must have **exercises** to **test** the operator on positioning the excavator within the trailer boundaries.	Mandatory Requirement
SSS-SIM-1382	The simulator excavator training module driving the excavator on a trailer exercises must have **exercises** to **teach** the operator to secure the excavator on the trailer using simulated chains and tie downs.	Mandatory Requirement
SSS-SIM-1383	The simulator excavator training module driving the excavator on a trailer exercises must have **exercises** to **teach** the operator to unsecure the excavator using simulated chains and tie downs.	Mandatory Requirement
SSS-SIM-1384	The simulator excavator training module driving the excavator on a trailer exercises must have **exercises** to **teach** the operator to drive the excavator off a trailer.	Mandatory Requirement
SSS-SIM-1387	**5.5.1.3.6 Perform Self-recovery Exercises (Option)**	Header
SSS-SIM-1388	The simulator excavator training module must have **exercises** to **teach** the operator to perform excavator **self-recovery** training using excavator arm and bucket.	Option
SSS-SIM-1389	**5.5.1.4 Excavator Task Exercises**	Header
SSS-SIM-1419	The simulator excavator training module must have **exercises** to **teach** the operator to perform excavator tasks.	Mandatory Requirement
SSS-SIM-1422	The simulator excavator training module must have **exercises** to **teach** the operator to perform leveling operations.	Mandatory Requirement
SSS-SIM-1429	The simulator excavator training module should have **exercises** to **teach** the operator to perform leveling operations by removing boulders.	Option
SSS-SIM-1430	The simulator excavator training module should have **exercises** to **teach** the operator to perform leveling operations by removing trees.	Option
SSS-SIM-1431	The simulator excavator training module must have **exercises** to **teach** the operator to perform clearing operations.	Mandatory Requirement
SSS-SIM-1433	The simulator excavator training module must have **exercises** to **teach** the operator to excavate a trench with a flat bottom according to specifications.	Mandatory Requirement
SSS-SIM-1437	The simulator excavator training module must have **exercises** to **teach** the operator to fill a trench.	Mandatory Requirement
SSS-SIM-1435	The simulator excavator training module must have **exercises** to **teach** the operator to unload the removed material in a designated area on the ground.	Mandatory Requirement
SSS-SIM-1436	The simulator excavator training module must have **exercises** to **teach** the operator to unload the removed material to a dump truck.	Mandatory Requirement
SSS-SIM-1424	The simulator excavator training module must have **exercises** to **teach** the operator to perform road constructions.	Mandatory Requirement
SSS-SIM-1425	The simulator excavator training module must have **exercises** to **teach** the operator to perform a side hill cut.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1426	The simulator excavator training module must have **exercises** to **teach** the operator to construct a road by excavating material.	Mandatory Requirement
SSS-SIM-1428	The simulator evacuator training module must have **exercises** to **teach** the operator to perform lifting operations.	Mandatory Requirement
SSS-SIM-1410	**5.5.1.5 Standard Military Testing Exercises (Option)**	Header
SSS-SIM-1413	The simulator excavator training module must have **exercises** to **test** the operator on creating a trafficable lane 3m L x 2m H x 4m W within five (5) minutes.	Option
SSS-SIM-1438	The simulator excavator training module must have **exercises** to **test** the operator on creating a trafficable ramp (1:3 slope) 3m W x 10m L within twenty (20) minutes.	Option
SSS-SIM-1439	The simulator excavator training module must have **exercises** to **test** the operator on excavating a position 2m D x 3.5m W x 7.5m L with a trafficable ramp (1:3) within sixty (60) minutes.	Option
SSS-SIM-1414	**5.5.2 Excavator Sandbox Module (Option)**	Header
SSS-SIM-1415	The simulator excavator program must have a sandbox module.	Option
SSS-SIM-1416	The simulator excavator sandbox module must allow the operator to have the freedom to experiment with the excavator operation in a realistic virtual environment.	Option
SSS-SIM-2596	The simulator excavator sandbox module must have **exercises** to teach all safety considerations.	Option
SSS-SIM-2602	The simulator excavator sandbox module must have **exercises** to allow the operator to fill in a trench with customized trench dimensions (length, width and depth).	Option
SSS-SIM-1440	**5.6 Grader Program Requirements**	Header
SSS-SIM-1441	The Simulator must have a program that simulates a grader.	Mandatory Requirement
SSS-SIM-1442	A "grader" is defined as a self-propelled articulating wheeled machine having attachments which grades or excavates through the forward motion of the machine.	Information
SSS-SIM-2423	The simulated grader must be based on an existing grader with net power of 100 KW or more.	Mandatory Requirement
SSS-SIM-1444	**5.6.1 Grader Training Module**	Header
SSS-SIM-1445	The simulator grader program must have a training module.	Mandatory Requirement
SSS-SIM-1446	The simulator grader training module must have **exercises** to **teach** a grader operator.	Mandatory Requirement
SSS-SIM-1447	The simulator grader training module must have **exercises** to **test** a grader operator.	Mandatory Requirement
SSS-SIM-1448	The grouping and sequencing of the grader training module **exercises** are at the Contractor's discretion.	Information
SSS-SIM-1449	**5.6.1.1 Pre-operational Inspection Exercises**	Header
SSS-SIM-1450	The simulator grader training module must have **exercises** to **teach** the operator to conduct pre-operational inspection.	Mandatory Requirement
SSS-SIM-1451	The simulator grader training module must have **exercises** to **test** the operator on pre-operational inspection.	Mandatory Requirement
SSS-SIM-1452	The simulator grader training module pre-operational inspection exercises must have **exercises** to **test** the operator on randomized equipment faults.	Mandatory Requirement
SSS-SIM-1453	**5.6.1.2 Control Exercises**	Header
SSS-SIM-1454	The simulator grader training module must have **exercises** to **teach** the operator to operate a single control or a few controls of the machine, such as a button, a joystick, a pedal, or a touchpad for machine interface.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1456	The simulator grader training module control exercises must include all controls used in any of the simulator grader training module.	Mandatory Requirement
SSS-SIM-1457	**5.6.1.3 Positioning Exercises**	Header
SSS-SIM-1458	**5.6.1.3.1 Driving Forward Exercises**	Header
SSS-SIM-1459	The simulator grader training module must have **exercises** to **teach** the operator to drive the grader forward.	Mandatory Requirement
SSS-SIM-1460	The simulator grader training module driving forward module must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1461	The simulator grader training module driving forward exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1464	**5.6.1.3.2 Driving Backward Exercises**	Header
SSS-SIM-1465	The simulator grader training module must have **exercises** to **teach** the operator to drive the grader backward.	Mandatory Requirement
SSS-SIM-1466	The simulator grader training module driving backward module must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1467	The simulator grader training module driving backward exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1470	**5.6.1.3.3 Maneuvering Exercises**	Header
SSS-SIM-1471	The simulator grader training module must have **exercises** to **teach** the operator to drive the grader in directions requiring switching between forward and backward driving.	Mandatory Requirement
SSS-SIM-1472	The simulator grader training module maneuvering exercises must have training **exercises** consisting of multiple driving paths that the operator has to follow.	Mandatory Requirement
SSS-SIM-1473	The simulator grader training module maneuvering exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Mandatory Requirement
SSS-SIM-1474	The simulator grader training module maneuvering exercises must have **exercises** to **teach** the operator to park the grader within a designated area.	Mandatory Requirement
SSS-SIM-1475	The simulator grader training module maneuvering exercises must have **exercises** to **test** the operator on parking the grader within a designated area.	Mandatory Requirement
SSS-SIM-1476	**5.6.1.3.4 Blade Positioning Exercises**	Header
SSS-SIM-1477	The simulator grader training module must have **exercises** to **teach** the operator to control the blade.	Mandatory Requirement
SSS-SIM-1478	The simulator grader training module blade positioning exercises must have training **exercises** consisting of multiple paths that the operator has to move the blade along.	Mandatory Requirement
SSS-SIM-1479	The simulator grader training module blade positioning exercises must have **exercises** to **test** the operator on moving the blade within the boundaries of a path.	Mandatory Requirement
SSS-SIM-1480	The simulator grader training module blade positioning exercises must have **exercises** to **teach** the operator to position the blade within a designated area.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1481	The simulator grader training module blade positioning exercises must have **exercises** to **test** the operator on positioning the blade within a designated area.	Mandatory Requirement
SSS-SIM-1482	**5.6.1.3.5 Driving the Grader on a Trailer Exercises**	Header
SSS-SIM-1483	The simulator grader training module must have **exercises** to **teach** the operator to drive the grader onto a trailer.	Mandatory Requirement
SSS-SIM-1484	The simulator grader training module driving the grader on a trailer **exercises** must include all safety considerations.	Mandatory Requirement
SSS-SIM-1485	The simulator grader training module driving the grader on a trailer exercises must have **exercises** to **teach** the operator to position the grader on a trailer.	Mandatory Requirement
SSS-SIM-1486	The simulator grader training module driving the grader on a trailer exercises must have **exercises** to **test** the operator on positioning the grader within the trailer boundaries.	Mandatory Requirement
SSS-SIM-1487	The simulator grader training module driving the grader on a trailer exercises must have **exercises** to **teach** the operator to secure the grader on the trailer using simulated chains and tie downs.	Mandatory Requirement
SSS-SIM-1488	The simulator grader training module driving the grader on a trailer exercises must have **exercises** to **teach** the operator to unsecure the grader using simulated chains and tie downs.	Mandatory Requirement
SSS-SIM-1489	The simulator grader training module driving the grader on a trailer exercises must have **exercises** to **teach** the operator to drive the grader off a trailer.	Mandatory Requirement
SSS-SIM-1492	**5.6.1.3.6 Perform Self-recovery Exercises**	Header
SSS-SIM-1493	This section is not used.	Information
SSS-SIM-1494	**5.6.1.4 Grader Task Exercises**	Header
SSS-SIM-1495	The simulator grader training module must have **exercises** to **teach** the operator to perform grader tasks.	Mandatory Requirement
SSS-SIM-1497	The simulator grader training module must have **exercises** to **teach** the operator to level a designated area.	Mandatory Requirement
SSS-SIM-1521	The simulator grader training module must have **exercises** to **teach** the operator to level a designated area by moving excess material to the side.	Mandatory Requirement
SSS-SIM-1522	The simulator grader training module must have **exercises** to **teach** the operator to level a designated area by finishing crown or cross slope.	Mandatory Requirement
SSS-SIM-1523	The simulator grader training module must have **exercises** to **teach** the operator to conduct road maintenance.	Mandatory Requirement
SSS-SIM-1505	**5.6.1.5 Other Attachments Exercises (Option)**	Header
SSS-SIM-1507	The simulator grader training module must have **exercises** to **teach** the operator to operate a scarifier.	Option
SSS-SIM-1508	The simulator grader training module must have **exercises** to **teach** the operator to operate a wing plow.	Option
SSS-SIM-1513	The simulator grader training module must have **exercises** to **teach** the operator to operate a V plow.	Option
SSS-SIM-2436	The simulator grader training module must have **exercises** to **teach** the operator to operate a moldboard.	Option
SSS-SIM-2437	The simulator grader training module must have **exercises** to **teach** the operator to operate a push blade.	Option
SSS-SIM-2438	The simulator grader training module must have **exercises** to **teach** the operator to operate a one way plow.	Option

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1514	**5.6.1.6 Standard Military Testing Exercises (Option)**	Header
SSS-SIM-1515	The simulator grader training module must have **exercises** to **test** the operator on constructing a road 12m W x 300m L W within twelve (12) minutes.	Option
SSS-SIM-1518	**5.6.2 Grader Sandbox Module (Option)**	Header
SSS-SIM-1519	The simulator grader program must have a sandbox module.	Option
SSS-SIM-1520	The simulator grader sandbox module must allow the operator to have the freedom to experiment with the grader operation in a realistic virtual environment.	Option
SSS-SIM-2597	The simulator grader sandbox module must have **exercises** to teach all safety considerations.	Option
SSS-SIM-1525	**5.7 Crane Program Requirements**	Header
SSS-SIM-1526	The simulator must have a program that simulates a crane.	Mandatory Requirement
SSS-SIM-1527	In this specification, a crane is defined as a wheeled self-propelled machine, capable of operating on and off road, all terrain, equipped with a hoist rope, wire ropes or chains and sheaves that can be used to lift and lower and horizontally move material according to load classification.	Information
SSS-SIM-2424	The simulated crane must be based on an existing crane with lift capacity of 40,000 kg or more (at 3 m); travel speed at 40km/h or more; and maximum telescopic boom extension of 30 m or more.	Mandatory Requirement
SSS-SIM-2858	The simulated crane must have removable counterweights pinned to the superstructure.	Mandatory Requirement
SSS-SIM-2725	The simulated crane must have a load moment indicator.	Mandatory Requirement
SSS-SIM-2726	The simulated crane load moment indicator must provide simulated load information.	Mandatory Requirement
SSS-SIM-2729	The simulated crane must have a crane load chart.	Mandatory Requirement
SSS-SIM-1529	**5.7.1 Mobile Crane Training Module**	Header
SSS-SIM-1530	The simulator crane program must have a training module.	Mandatory Requirement
SSS-SIM-1531	The simulator crane training module must have **exercises** to **teach** a mobile crane operator.	Mandatory Requirement
SSS-SIM-1532	The simulator crane training module must have **exercises** to **test** a mobile crane operator.	Mandatory Requirement
SSS-SIM-1533	The grouping and sequencing of the crane training module **exercises** are at the Contractor's discretion.	Information
SSS-SIM-1534	**5.7.1.1 Pre-operational Inspection Exercises**	Header
SSS-SIM-1535	The simulator crane training module must have **exercises** to **teach** the operator to conduct pre-operational inspection.	Mandatory Requirement
SSS-SIM-1536	The simulator crane training module must have **exercises** to **test** the operator on pre-operational inspection.	Mandatory Requirement
SSS-SIM-1537	The simulator crane training module pre-operational inspection exercises must have **exercises** to **test** the operator on randomized equipment faults.	Mandatory Requirement
SSS-SIM-1538	**5.7.1.2 Control Exercises**	Header
SSS-SIM-1539	The simulator crane training module must have **exercises** to **teach** the operator to operate a single control or a few controls of the machine, such as a button, a joystick, a pedal, or a touchpad for machine interface.	Mandatory Requirement
SSS-SIM-1541	The simulator crane training module control exercises must include all controls used in the simulator crane training modules.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1542	**5.7.1.3 Positioning Exercises**	Header
SSS-SIM-1561	**5.7.1.3.1 Outrigger Positioning Exercises**	Header
SSS-SIM-1562	The simulator crane training module must have **exercises** to **teach** the operator to control the outriggers by extending them to certain positions.	Mandatory Requirement
SSS-SIM-1600	The simulator crane training module must have **exercises** to **teach** the operator to control the outriggers by retracting them for storage.	Mandatory Requirement
SSS-SIM-2824	**5.7.1.3.2 Counterweight installation/uninstallation**	Header
SSS-SIM-2825	The simulator crane training module must have **exercises** to **teach** the operator to install and uninstall counterweights.	Mandatory Requirement
SSS-SIM-1579	**5.7.1.3.3 Boom Positioning Exercises**	Header
SSS-SIM-1601	The simulator crane training module boom positioning exercises must have training **exercises** consisting of multiple distances.	Mandatory Requirement
SSS-SIM-1580	The simulator crane training module must have **exercises** to **teach** the operator to perform boom lift tasks within a 360 degree area.	Mandatory Requirement
SSS-SIM-1586	**5.7.1.3.4 Hook Block Exercises**	Header
SSS-SIM-1604	The simulator crane training module must have training hook block positioning **exercises**.	Mandatory Requirement
SSS-SIM-1588	The simulator crane training module hook block **exercises** must **teach** the operator to pay in the hook block.	Mandatory Requirement
SSS-SIM-1603	The simulator crane training module hook block **exercises** must **teach** the operator to pay out the hook block.	Mandatory Requirement
SSS-SIM-1589	The simulator crane training module hook block must have **exercises** to **teach** the operator to pick up and move various items to designated areas.	Mandatory Requirement
SSS-SIM-1595	**5.7.1.4 Mobile Crane Task Exercises**	Header
SSS-SIM-1611	The simulator mobile crane training module should have **exercises** to **teach** the operator to perform raising and swinging in unison.	Rated Requirement
SSS-SIM-1608	The simulator mobile crane training module must have **exercises** to **teach** the operator to perform lift operations.	Mandatory Requirement
SSS-SIM-2632	The simulator mobile crane training module must have **exercises** to **test** the operator to perform lift operations.	Mandatory Requirement
SSS-SIM-2288	**5.7.1.5 Two Cranes doing Tandem Lift**	Header
SSS-SIM-1607	The simulator mobile crane training module should have **exercises** to **teach** the operator to perform dual crane lift.	Rated Requirement
SSS-SIM-1597	**5.7.2 Mobile Crane Sandbox Module (Option)**	Header
SSS-SIM-1598	The simulator mobile crane program must have a sandbox module.	Option
SSS-SIM-1599	The simulator mobile crane sandbox module must allow the operator to have the freedom to experiment with the mobile crane operation in a realistic virtual environment.	Option
SSS-SIM-2598	The simulator mobile crane sandbox module must have **exercises** to teach all safety considerations.	Option
SSS-SIM-1673	**5.8 Forklift Program Requirements (Option)**	Header
SSS-SIM-1674	The Simulator must have a program that simulates a forklift.	Option
SSS-SIM-1675	A "forklift" is defined as a self-propelled wheeled machine with a mast to lift and stack material. The forklift is intended primarily for operation on unimproved natural terrain and on disturbed terrain such as construction sites.	Information
SSS-SIM-2425	The simulated forklift must be based on a medium forklift with rated capacity of 3000 kg or more.	Option

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1677	**5.8.1 Forklift Training Module (Option)**	Header
SSS-SIM-1678	The simulator forklift program must have a training module.	Option
SSS-SIM-1679	The simulator forklift training module must have **exercises** to **teach** a forklift operator.	Option
SSS-SIM-1680	The simulator forklift training module must have **exercises** to **test** a forklift operator.	Option
SSS-SIM-1681	The grouping and sequencing of the forklift training module **exercises** are at the Contractor's discretion.	Information
SSS-SIM-1682	**5.8.1.1 Pre-operational Inspection Exercises**	Header
SSS-SIM-1683	The simulator forklift training module must have **exercises** to **teach** the operator to conduct pre-operational inspection.	Option
SSS-SIM-1684	The simulator forklift training module must have **exercises** to **test** the operator on pre-operational inspection.	Option
SSS-SIM-1685	The simulator forklift training module pre-operational inspection exercises must have **exercises** to **test** the operator on randomized equipment faults.	Option
SSS-SIM-1686	**5.8.1.2 Control Exercises**	Header
SSS-SIM-1687	The simulator forklift training module must have **exercises** to **teach** the operator to operate **primary** and **secondary controls** of the forklift.	Option
SSS-SIM-1689	The simulator forklift training module control exercises must include all controls used in the simulator forklift training modules.	Option
SSS-SIM-2633	**5.8.1.2.1 Mast Positioning Exercises**	Header
SSS-SIM-2634	The simulator forklift training module must have **exercises** to **teach** the operator to control the mast.	Option
SSS-SIM-2635	The simulator forklift training module must have **exercises** to **teach** the operator to raise the mast.	Option
SSS-SIM-2636	The simulator forklift training module must have **exercises** to **teach** the operator to lower the mast.	Option
SSS-SIM-2637	The simulator forklift training module must have **exercises** to **teach** the operator to tilt the mast.	Option
SSS-SIM-1690	**5.8.1.3 Positioning Exercises**	Header
SSS-SIM-1714	**5.8.1.3.1 Driving Forward Exercises**	Header
SSS-SIM-1715	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift forward following a path.	Option
SSS-SIM-2300	The simulator forklift training module driving forward exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Option
SSS-SIM-1728	**5.8.1.3.2 Driving Backward Exercises**	Header
SSS-SIM-1716	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift backward following a path.	Option
SSS-SIM-1734	The simulator forklift training module driving backward exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Option
SSS-SIM-1736	**5.8.1.3.3 Maneuvering Exercises**	Header
SSS-SIM-1737	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift in directions requiring switching between forward and backward driving.	Option
SSS-SIM-1738	The simulator forklift training module maneuvering exercises must have training **exercises** consisting of multiple driving paths that the operator must follow.	Option

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1739	The simulator forklift training module maneuvering exercises must have **exercises** to **test** the operator on driving within the boundaries of the driving path.	Option
SSS-SIM-1740	The simulator forklift training module maneuvering exercises must have **exercises** to **teach** the operator to park the forklift within a designated area.	Option
SSS-SIM-1741	The simulator forklift training module maneuvering exercises must have **exercises** to **test** the operator on parking the forklift within a designated area.	Option
SSS-SIM-2836	The simulator forklift training module maneuvering exercises must have **exercises** to **teach** the operator to perform omnidirectional (crab) steering.	Option
SSS-SIM-2739	The simulator forklift training module maneuvering exercises must have **exercises** to **test** the operator to perform omnidirectional (crab) steering.	Option
SSS-SIM-1691	**5.8.1.3.4 Mast Positioning Exercises**	Header
SSS-SIM-1692	The simulator forklift training module must have **exercises** to **test** the operator to control the mast.	Option
SSS-SIM-1693	The simulator forklift training module must have **exercises** to **test** the operator to raise the mast.	Option
SSS-SIM-1712	The simulator forklift training module must have **exercises** to **test** the operator to lower the mast.	Option
SSS-SIM-1713	The simulator forklift training module must have **exercises** to **test** the operator to tilt the mast.	Option
SSS-SIM-1694	**5.8.1.3.5 Fork Table Positioning Exercises**	Header
SSS-SIM-1695	The simulator forklift training module must have **exercises** to **teach** the operator to shift the fork table left to pick up an object.	Option
SSS-SIM-1696	The simulator forklift training module must have **exercises** to **teach** the operator to shift the fork table right to pick up an object.	Option
SSS-SIM-1697	**5.8.1.3.6 Fork Positioning Exercises**	Header
SSS-SIM-1698	The simulator forklift training module must have **exercises** to **teach** the operator to lift objects with the forks.	Option
SSS-SIM-1699	The simulator forklift training module must have **exercises** to **teach** the operator to use the forks to reposition objects before lifting them.	Option
SSS-SIM-1727	The simulator forklift training module must have **exercises** to **teach** the operator to lower objects with the forks.	Option
SSS-SIM-1752	**5.8.1.3.7 Driving the Forklift on a Trailer Exercises**	Header
SSS-SIM-1753	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift onto a trailer.	Option
SSS-SIM-1754	The simulator forklift training module driving the forklift on a trailer **exercises** must include all safety considerations.	Option
SSS-SIM-1755	The simulator forklift training module driving the forklift on a trailer must have **exercises** to **teach** the operator to position the forklift on a trailer.	Option
SSS-SIM-1756	The simulator forklift training module driving the forklift on a trailer exercises must have **exercises** to **test** the operator on positioning the forklift within the trailer boundaries.	Option
SSS-SIM-1757	The simulator forklift training module driving the forklift on a trailer exercises must have **exercises** to **teach** the operator to secure the forklift using simulated chains and tie downs.	Option
SSS-SIM-1758	The simulator forklift training module driving the forklift on a trailer exercises must have **exercises** to **teach** the operator to unsecure the forklift using simulated chains and tie downs.	Option

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-1759	The simulator forklift training module driving the forklift on a trailer exercises must have **exercises** to **teach** the operator to drive the forklift off a trailer.	Option
SSS-SIM-1762	**5.8.1.3.8 Perform Self-Recovery Exercises**	Header
SSS-SIM-1763	This section is not required.	Information
SSS-SIM-1744	**5.8.1.4 Lift Task Exercises**	Header
SSS-SIM-1718	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift to a designated area to lift an object.	Option
SSS-SIM-1745	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift to a designated area to off load an object on the ground.	Option
SSS-SIM-1746	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift to a designated area to lift an object on a raised platform.	Option
SSS-SIM-1747	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift to a designated area to off load an object on a raised platform.	Option
SSS-SIM-1748	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift to a designated area to extend the mast to pick up an object.	Option
SSS-SIM-1749	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift to a designated area to extend the mast to off load an object.	Option
SSS-SIM-1750	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift to a designated area to shift the fork table to pick up an object.	Option
SSS-SIM-1751	The simulator forklift training module must have **exercises** to **teach** the operator to drive the forklift to a designated area to shift the fork table to off load an object.	Option
SSS-SIM-43	**6 SIMULATOR HOUSING**	Header
SSS-SIM-2350	The simulator system must be housed in a simulator housing placed outdoors.	Mandatory Requirement
SSS-SIM-2683	The simulator housing must be a pre-manufactured semi-permanent, relocatable and modular structure.	Mandatory Requirement
SSS-SIM-2672	The simulator housing must be **weatherproof** and operational all year round.	Mandatory Requirement
SSS-SIM-2659	A simulator housing unit must house at least one motion simulator, two portable simulators (deployed), one instructor station, all associated controls, furniture, printers, controls, displays, computers, portable simulator transportation cases, desks, chairs and cabinets.	Mandatory Requirement
SSS-SIM-2670	A simulator housing unit must have enough room to hold at least 4 extra persons in addition to what is specified in SSS-SIM-2659, three students at the operator stations and one instructor at the instructor station.	Mandatory Requirement
SSS-SIM-2351	The simulator housing layout must be designed for easy access to the operator stations and the instructor stations.	Mandatory Requirement
SSS-SIM-2362	The simulator housing layout must be designed for easy access to the printer.	Mandatory Requirement
SSS-SIM-2348	Canada will prepare the site for the simulator housing.	Information
SSS-SIM-2352	Canada will perform final connection of power and telecommunications to the simulator housing.	Information

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2169	**6.1 Simulator Housing Standards**	Header
SSS-SIM-2831	**6.1.1 National Standard of Canada**	Header
SSS-SIM-2744	The simulator housing must comply with the National Standard of Canada CAN/UL 2600:2019, Relocatable Buildings.	Mandatory Requirement
SSS-SIM-2863	**6.1.2 Canadian Electric Code**	Header
SSS-SIM-2864	The simulator housing must meet or exceed all federal and provincial electrical codes.	Mandatory Requirement
SSS-SIM-2865	The simulator housing electrical and heating materials must be compliant with CSA standards.	Mandatory Requirement
SSS-SIM-2171	**6.1.3 National Fire Code of Canada**	Header
SSS-SIM-1826	The simulator housing must comply with the National Fire Code of Canada (latest version).	Mandatory Requirement
SSS-SIM-2316	The simulator housing must comply with the Canadian Forces Fire Marshall Directive FMD 4003 "Fire Protection and Life Safety Engineering Design" (latest revision).	Mandatory Requirement
SSS-SIM-2317	The simulator housing must comply with the fire separations of level II IT facilities in accordance with the Canadian Forces Fire Marshall Directive FMD 4003 "Fire Protection and Life Safety Engineering Design" (latest revision).	Mandatory Requirement
SSS-SIM-2318	The simulator housing must have the supplementary clean agent fire extinguishing system in accordance with Canadian Forces Fire Marshall Directive FMD 4003 "Fire Protection and Life Safety Engineering Design" (latest revision).	Mandatory Requirement
SSS-SIM-2319	The simulator housing must comply with the fire alarm system of Level II IT facilities in accordance with Canadian Forces Fire Marshall Directive FMD 4003 "Fire Protection and Life Safety Engineering Design" (latest revision).	Mandatory Requirement
SSS-SIM-2302	**6.2 Simulator Housing Infrastructure Requirements**	Header
SSS-SIM-2661	**6.2.1 Doors**	Header
SSS-SIM-2666	The simulator housing must have one door or more.	Mandatory Requirement
SSS-SIM-2667	The simulator housing door (s) must be lockable from the outside with a key.	Mandatory Requirement
SSS-SIM-2662	**6.2.2 Flooring**	Header
SSS-SIM-2664	The simulator housing floor must be covered with commercial linoleum.	Mandatory Requirement
SSS-SIM-2671	The simulator housing floor must withstand, without damage, the simultaneous operation of all simulators.	Mandatory Requirement
SSS-SIM-1831	**6.2.3 Heating, Ventilation and Air Conditioning (HVAC) System**	Header
SSS-SIM-2145	The simulator housing must have a Heating, Ventilation and Air Conditioning (HVAC) system.	Mandatory Requirement
SSS-SIM-1832	The HVAC system must maintain the internal temperature range between 10° C and 40° C without condensation, all year round.	Mandatory Requirement
SSS-SIM-1840	The HVAC system must maintain the internal humidity range between 10% to 80% without condensing, all year round.	Mandatory Requirement
SSS-SIM-2309	The HVAC system must be able to reach the housing temperature from 10°C to 20°C within two hours, all year round.	Mandatory Requirement
SSS-SIM-2310	The HVAC system must be able to reach the housing temperature from 40°C to 25°C within two hours, all year round.	Mandatory Requirement
SSS-SIM-2108	**6.2.4 Uninterruptible Power System**	Header
SSS-SIM-2106	The **simulator housing** must have an Uninterruptible Power System (UPS) for all the operator stations and the instructor stations.	Mandatory Requirement
SSS-SIM-2107	The Uninterruptible Power System (UPS) must have sufficient capacity to allow for **graceful shutdown** in the event of an electrical outage.	Mandatory Requirement

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2687	The UPS must meet IEC 62040-1 safety requirements.	Mandatory Requirement
SSS-SIM-2355	**6.2.5 Printer**	Header
SSS-SIM-2692	Each simulator housing unit must have one or more enabled printer.	Mandatory Requirement
SSS-SIM-2693	The printer must be networked with all the simulator operator and instructor stations of the same simulator housing unit.	Mandatory Requirement
SSS-SIM-2694	The printer must be a monochrome laser printer.	Mandatory Requirement
SSS-SIM-2832	The printer must print double-sided.	Mandatory Requirement
SSS-SIM-2696	The printer must have a print speed of minimum 20 pages per minute.	Mandatory Requirement
SSS-SIM-2695	The printer must have a **monthly duty cycle** of minimum 25,000.	Mandatory Requirement
SSS-SIM-2322	**6.2.6 Power and Lighting System**	Header
SSS-SIM-2301	The simulator housing must have a power and lighting system.	Mandatory Requirement
SSS-SIM-2312	The lighting system must designed to minimize glare of the screen.	Mandatory Requirement
SSS-SIM-2331	The simulator housing must have power outlets for all simulator operator stations, instructor stations and printers.	Mandatory Requirement
SSS-SIM-2332	Each simulator housing unit must have 8 or more spare power outlets of 110 V to 120 V.	Mandatory Requirement
SSS-SIM-2324	**6.2.7 Communication System**	Header
SSS-SIM-2335	The simulator housing must have ethernet outlets for all simulator operator stations, instructor stations and printers.	Mandatory Requirement
SSS-SIM-2336	Each simulator housing unit must have 8 or more spare ethernet outlets.	Mandatory Requirement
SSS-SIM-2323	**6.2.8 Furniture**	Header
SSS-SIM-2339	The simulator housing must have all furniture required for operator training.	Mandatory Requirement
SSS-SIM-2337	The simulator housing must have lockable cabinets to store all controls.	Mandatory Requirement
SSS-SIM-2313	The simulator housing must have one desk for each portable simulator.	Mandatory Requirement
SSS-SIM-2338	The simulator housing must have one chair for each portable simulator.	Mandatory Requirement
SSS-SIM-2433	The simulator housing must have one desk for each instructor station.	Mandatory Requirement
SSS-SIM-2434	The simulator housing must have one chair for each instructor station.	Mandatory Requirement
SSS-SIM-2152	The simulator housing must have all the support and mountings for all simulator operator stations, instructor stations and printers.	Mandatory Requirement
SSS-SIM-2444	**7 DEFINITIONS**	Header
SSS-SIM-2762	An **After Action Review** (AAR) is defined as a structured review, or de-brief process for analyzing what happened, why it happened and how it can be done better by the operators using the simulator.	Information
SSS-SIM-2445	**Autonomous learning** is defined as an approach to learning with which learners hold the power to regulate and control their own learning activities without instructor or exterior help other than the simulator itself.	Information
SSS-SIM-2872	**Dynamics** is defined as the relation between the force and motion and the equilibrium of objects and bodies.	Information
SSS-SIM-2446	An **exercise** is defined a structured task in a training curriculum with pass/fail criteria in a realistic virtual environment using the specific machine.	Information

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2447	A **graceful shutdown** is when a computer is turned off by software function and the operating system (OS) is allowed to perform its tasks of safely shutting down processes and closing connections.	Information
SSS-SIM-2448	A **hot swappable** device is a peripheral or component that can be removed or added without stopping or shutting down the system.	Information
SSS-SIM-2449	A **Human Machine Interface (HMI)** is a user interface that connects an operator to the controller for the simulated machine. The interface consists of hardware and software that allow user inputs to be translated as signals for machines that, in turn, provides the user with active functions to perform and/or provide feedback on the results of those actions and/or information on the system's performance.	Information
SSS-SIM-2788	A **Key Performance Metric** is defined as a measurable value to measure and monitor the performance of an operator. It demonstrates how proficient an operator is and enables to identify key areas for improvement. A key performance metric must be well defined, measurable and crucial for the efficient and safe operation of the simulated equipment.	Information
SSS-SIM-2812	A **Leaderboard** is defined as a display that shows the name and scores of the highest ranked participants in a training module or scenario.	Information
SSS-SIM-2821	**Loam** is defined as a soil consisting of a friable mixture of varying proportions of clay, silt, and sand.	Information
SSS-SIM-2697	The **monthly duty cycle** represents the absolute number of pages that a printer is designed to print, without damage, in one month.	Information
SSS-SIM-2686	**Net power** is defined as power obtained on a test bed, at the end of the crankshaft or equivalent (ISO 9249-2007).	Information
SSS-SIM-2588	The **operating humidity** refers to the humidity when the simulator is powered and fully operational.	Information
SSS-SIM-2452	The **operating temperature** refers to the temperature when the simulator is powered and fully operational.	Information
SSS-SIM-2807	**Performance management** is defined as the set of activities aimed at improving the performance of the operator. Performance management activities include: defining targets, defining expectations, setting standards, setting performance indicators, measuring the performance, assessing results and providing feedback.	Information
SSS-SIM-2654	**Primary control** is defined as control that is used frequently or continuously by the operator (see ISO 6682).	Information
SSS-SIM-2450	**Progressive** means gradually increasing the training difficulty from easy to difficult, in a coherent way, by means of multiple exercises.	Information
SSS-SIM-2656	**Realistic** describes sounds, movement, physical properties, and visual properties that are consistent with the real world and that are of similar feel, from a user perspective, to the real world. This would normally be accomplished through a high quality, stable, real-time rendering visual, audio and motion system providing optimal perceptual cues for judging distance, speed, force and physical properties.	Information
SSS-SIM-2886	**Rock** soil is defined as a soil consisting of blasted or crushed rocks (stones or angled rocks) typically used as construction aggregate. This type of soil would support the loader and excavator training modules.	Information
SSS-SIM-2887	**Sand** soil is defined as a soil consisting of a high proportion of sand and low proportions of clay and silt. A sandy soil is made of very small aggregates and is very hard to compact, thus making the soil loose.	Information
SSS-SIM-2701	The **secondary controls** are defined as those infrequently used by the operator but is needed for the proper functioning of the machine (e.g. control for parking brake, lighting).	Information
SSS-SIM-2638	**Self-recovery** is defined as the capability of a powered vehicle to extract itself when a loss of traction occurs.	Information
SSS-SIM-2589	The **training program** refers to the training curriculum. Each program consists of a total package of learning activities designed to achieve the objectives of the training.	Information

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2590	The **stereo sound** is a method of sound reproduction that creates an illusion of multidirectional audible perspective. This is usually achieved by using two or more independent audio channels through a configuration of two or more loudspeakers (or stereo headphones) in such a way as to create the impression of sound heard from various directions, as in natural hearing.	Information
SSS-SIM-2453	The **storage humidity** refers to the humidity at which the simulator can be safely stored when it is not powered.	Information
SSS-SIM-2587	The **storage temperature** refers to the temperature at which the simulator can be safely stored when it is not powered.	Information
SSS-SIM-2456	**Teach** is defined as instructing by precept, example, or experience.	Information
SSS-SIM-2457	**Test** is defined as measuring the skill, knowledge, intelligence, capacities, or aptitudes of an individual or group.	Information
SSS-SIM-2795	A **virtual environment** is defined as a synthetic version of the real world that is consistent with the real world and that the operator can interact with in an immersive way.	Information
SSS-SIM-2675	**Weatherproof** is defined as able to withstand continuous exposure to local weather, all year round, without damage or loss of function.	Information
SSS-SIM-2459	**8 ACRONYMS**	
SSS-SIM-2838	ACQSOW: Acquisition Statement of Work	Information
SSS-SIM-2761	AAR: After Action Review	Information
SSS-SIM-2606	CA: Canadian Army	Information
SSS-SIM-2607	CAF: Canadian Armed Forces	Information
SSS-SIM-2620	CER: Combat Engineer Regiment	Information
SSS-SIM-2619	CFSME: Canadian Forces School of Military Engineering	Information
SSS-SIM-2603	CHER: Common Heavy Equipment Replacement	Information
SSS-SIM-2621	ESR: Engineer Support Regiment	Information
SSS-SIM-2608	HCE: Heavy Construction Equipment	Information
SSS-SIM-2614	HMI: Human Machine Interface	Information
SSS-SIM-2609	HSE: Heavy Support Equipment	Information
SSS-SIM-2617	HVAC: Heating, Ventilation and Air Conditioning	Information
SSS-SIM-2616	LED: Light-emitting Diode	Information
SSS-SIM-2615	LCD: Liquid Crystal Display	Information
SSS-SIM-2610	MHE: Material Handling Equipment	Information
SSS-SIM-2612	MTBF: Mean Time Between Failures	Information
SSS-SIM-2611	OEM: Original equipment manufacturer	Information
SSS-SIM-2651	PPE: Personal protective equipment	Information
SSS-SIM-2604	SOW: Statement of Work	Information
SSS-SIM-2618	UPS: Uninterruptible Power System	Information

1. ID	2. Technical Specification	3. Requirement Type
SSS-SIM-2458	**9 REFERENCES**	Header
SSS-SIM-2628	Canadian Forces Fire Marshall Directive FMD 4003 "Fire Protection and Life Safety Engineering Design" (revised December 2014)	Information
SSS-SIM-2796	CAN/UL 2600:2019: Relocatable buildings	Information
SSS-SIM-2834	IEC 60529: Degrees of protection provided by enclosures (IP Code)	Information
SSS-SIM-2835	IEC 62040-1: Uninterruptible power systems (UPS)	Information
SSS-SIM-2622	ISO 10968:2004: Operator's Controls	Information
SSS-SIM-2833	ISO 11112:1995: Operator's Seat - Dimensions and Requirements	Information
SSS-SIM-2623	MIL-STD-810F: Test Method Standard for Environmental Engineering Considerations and Laboratory Tests	Information
SSS-SIM-2624	MIL-STD-1472G: Design Criteria Standard - Human Engineering	Information
SSS-SIM-2626	National Building Code of Canada (2015)	Information
SSS-SIM-2630	National Energy Code of Canada for Building (2015)	Information
SSS-SIM-2627	National Fire Code of Canada (2015)	Information
SSS-SIM-2629	National Plumbing Code of Canada (2015)	Information
SSS-SIM-2625	The Complete Rigger's Reference Handbook, Third Edition by Mike Riggs, published by Source Atlantic.	Information