

**DETAILS OF TECHNICAL SPECIFICATIONS FOR PROCUREMENT
OF 3D, 270/360 DEGREES AERODROME, CUM RADAR SIMULATOR,
FOR ATS SCHOOL CATI, HYDERABAD, PAKISTAN**

HARDWARE REQUIREMENTS

RADAR Simulator

1 Radar Trainee Controller (5 Positions)

- 30-inch radar situation display (5)
- 19-inch information display (5)
- 12-inch touch input display for the communication control. (5)

2 The System Engineer (1 Position)

- 19-inch monitor display (1)

3 Pseudo Pilots (8 Positions)

- 19 inch radar situation display (8)
- 19 inch information display (8)
- 12-inch touch input display for the communication control (8).

ATC TOWER Simulator

4 Tower Trainee Controller (1 Position)

- 19-inch approaches monitor for radar situation display (1)
- 19-inch information display (1)
- 12-inch touch input display for the communication control.(1)

5 Ground Trainee Controller (1 Position)

- 19-inch approaches monitor for Radar situation display (1)
- 19-inch touch input display for the lighting control panel (1)

- 12-inch touch input display for the communication control (1)

6 Exercise Supervisor with System Over-riding Facility (1 Position)

- 19-inch approaches monitor Radar situation display (1)
- 19-inch information display (1)
- 12-inch touch input display for the communication control (1)

7 Strip printing

Strip printing must have the following components

- Strip printer
- A serial / USB connection
- Strip reel
- Automatic strip cutter

8 Projection system

Projectors should have high brightness; high resolution, high reliability and low noise factor and also have a low maintenance and consumable running cost.

SOFTWARE REQUIREMENTS

- Real time dynamic simulation allowing: flight path changes, missed approaches, runway changes, 180 degree turns, touch and go, runway exit and line-up changes, should be available.
- Ground traffic management with dynamic controlled aircraft and vehicles. Special effects such as smoke, crashes, bird activities, real time weather changes, including simulation of different weather conditions in day, dawn, dusk or night conditions.
- Exercise management, simulation pause for briefing of trainees, recording and replay of exercise for better visual concepts of trainees including all voice communication and real time action.

- Airfield lighting touch control using various ON/OFF switches operation of Runways and Taxi ways.
- Exercise preparation tools should be provided, so that different exercises with different airfield layouts and aerodrome conditions could be loaded.
- The Data base must cater for creation of different airfield layouts including runways, taxiways and parking areas using Linux / MS windows operational system
- The simulator should be capable of giving a good aerodrome circuit description of crosswind, down wind, base leg and final segments to be flown by the aircraft.
- The system should be able to shift the eye point from one place to the other.

Database:

- The database and software should not have inherent limits on the number of data items in any category.
- The system should include a library of all flight plans.
- The Flight Plan Library should be easy to select and edit.
- The user should be able to add traffic samples to exercises with one click.
- The Flight Plan editor should be a powerful tool for quick creation of exercises.
- The Flight Plan editor should allow the operator to create and select groups of flight plans to represent typical parts of traffic patterns.
- The Flight Plan should be easy to modify and to adapt groups and individual plans.
- The user should have access to the simulation database.
- The operator should be able to make global changes. e.g. if frequencies or names are changed.
- The operator should be able to produce briefing notes and training reports.
- The operator should have the facility to create new flights on-line.

- The system should give greater scope to match student capabilities and to explore ad-hoc problems.

Data Preparation:

- ATC-friendly data preparation facilities should cover all aspects of the simulator programming.
- Operators should be able to run data preparation on any PC, then they should be able to test in isolation and then download for use.
- The system should provide exercise visualization and editing tools
- The system should provide facilities for importing flight plans and ATC data.
- Users should be able to create and change 3D visual airfield models for themselves.
- Users should be able to edit 3D aircraft models for themselves.
- The operator should be able to run any role at any work station.
- The operator should be able to add extra workstations.
- The system should be designed with a rational data base.
- The system should be designed for ease of data import and export.
- The system should allow the user to create customized radar displays.

Instructor Facilities:

- The Instructor / Supervisor Facility should be comprehensive, easy to use and have an override role.
- The facility should allow the instructor to monitor all students.
- The instructor should be able to join and leave any exercise.
- The instructor should be able to modify exercises.

- The system should allow the instructor to record, replay and resume any exercise.
- The operator should be able to mark any event during an exercise.
- The operator should be able to jump in time during replay relative to any event.
- The system should allow high time rate performance with high traffic loads.
- The system should allow time jump + and - with high traffic loads.
- The facility should save the operator time in training and testing exercises.

TRAINING FACILITIES

ATC tower simulator should cover all levels and types of training as follows

Ab initio

Rating

Validation

On-job-training support

Conversion

Refresher

Competency checks

Handling emergencies and unusual situations

Approach control - Radar and non-radar

Tower control

Ground and ramp control

Tower data assistant working

SELF-TEACH FACILITIES

Radar simulator should incorporate self-teach facilities, so that controllers and pseudo-pilots can learn and practice on their own.

The instructor should be able to:

- Prepare tasks;
- Define the correct responses;
- Write responses to right and wrong actions;
- Set time limits for actions and
- Define simulator reactions to actions.
- The results must be measureable and recorded.

PSEUDO PILOT FACILITY:

The Pseudo-Pilot Facility should be easy to learn and use.

- The Pseudo-Pilot facility should be designed to be ATC realistic.
- The system should have hot keys and mouse along with data and graphical inputs in any combination.
- The facility should have combined commands and deferred commands.
- The system should provide scripting facilities to the operator.
- The operator should be able to transfer any aircraft to a working frequency.
- There should be no inaccessible background tracks within the system.
- The command interface should be designed for speed and ease of use with both keyboard and mouse inputs.

Record - Replay and Resume:

- The system should contain complete, self-sufficient exercise recordings.
- The system should be independent of any subsequent database changes.
- The operator should be able to resume to “live” working at any time during a replay.
- The system should be designed to show a resumed exercise as a new recording.
- The operator should be able to build up sets of solutions and trials.

Weather Simulation:

- The system should provide realistic weather simulation.
- Weather definition should be held in separate files.
- The Weather Simulation feature should be a powerful way of creating different exercises quickly. e.g. run the same traffic with opposite wind conditions.
- The system should provide dynamic scripting for weather changes automatically.

Scripting Facilities:

- The Scripting Facility should be designed to be a very powerful, simulation tool.
- The process of creating and editing scripts should be easy and quick.
- The operator should be able to apply scripts to airspaces; exercise; flight plan and Weather.
- The Scripting Facility should increase realism and allow adjacent sectors to appear to be manned and operated correctly.
- The operation of Scripting facilities should simplify data preparation.

- The Scripting Facility should reduce instructor and pseudo-pilot workloads.
- The Scripting Facility should allow the operator to easily create complex and unusual procedures.
- The Scripting Facility should include a wild card and conditional commands.
- The Scripting Facility should ensure exercise repeatability and consistency for training and testing.
- It should be possible to create scripts by running the simulator, the commands may then be saved and converted into scripts using a simple editor.

Background Scene

- 1 3D representation of buildings and geographical items with color fill should be included. (Full / detailed photo-realistic scenes using a combination of 3D modeling and 2D bill boarding)
- 2 Visual billboards should not be used. 3D models with correct occulting should be included. (e.g. An aircraft passing behind a building should not be visible, but when passing in front of it should be visible with part of the building being obscured.
- 3 Airfield lighting, environmental lighting, chimney smoke, windsocks, overrun barrier operations should all be modeled.
- 4 Suitable numbers of dynamic object models - both aircraft and vehicles should be provided.
- 5 The 3D models of aircraft should have level of detail changes as a function of their distance from the tower.
- 6 Smooth surface representation with shading should be provided.
- 7 The ability to detect, recognize and identify aircraft type should be given. Correct size scaling and perspective should be provided. The user should have the facility for setting and changing a scaling factor for the aircraft models.
- 8 The ability to identify aircraft livery must be provided.

9 Aircraft position, attitude and movements should be simulated accurately, realistically and smoothly.

10 Shadows should be simulated - moving across the ground and tying the aircraft to the ground (when on the ground).

11. During the day Aircraft lighting should be provided with automatic switching based on time of day and or configuration and phase of flight. Manual operation and override should also be provided. At appropriate times of day, the shadows should be replaced by aircraft light pools.

Airfield Lighting

- Control of airfield lighting on/off and intensity should be provided. This should include
 - 1 Runway Lights
 - 2 Approach Lights
 - 3 PAPIs
 - 4 VASIs
 - 5 Taxiway Lights
 - 6 Stop Bars
 - 7 Traffic Lights
 - 8 Barriers
 - 9 Obstruction Lights.

- Control of strings of lights should be provided. Control of individual lights (e.g. Stop Bar) or groups of lights should be provided.

- A lighting panel design program should be included which would control the lights and pass instructions through the visual gateway to the visual system.

- Environmental lighting should be provided which operates automatically depending on time of day. These lights can include airport building lights, towns, street lighting.

NOTE. All the above mentioned requirements are the minimum requirements, which must be met. It may again be noted that all equipment should be latest, branded and of Western origin only. Additionally, the name of the manufacturer must be mentioned with all major components of the system. The compliance sheet must be complied with.

All clarifications on Technical Specifications may be sought from:-

dcati@caapakistan.com.pk

or

through fax, No. +92 22 9260324

TECHNICAL SPECIFICATIONS

(COMPLIANCE SHEET)

Provision, installation, testing and commissioning of 3D (360/270 Degrees) Aerodrome cum Radar Integrated Simulator by reputable international OEM's / local agents, at Civil Aviation Training Institute Hyderabad, Pakistan, on Turnkey basis, as per Compliance Sheet and attached Technical Specifications.

3D Aerodrome and Radar Simulator

Positions

- 3-D Aerodrome (control tower & ground) positions: Two positions
- Area Radar control positions: Three positions
- Approach Radar control position: One position
- Pseudo pilot positions: Eight positions
- Exercise supervisor/Instructor position: One position
- System manager/engineer Test position: One position
- Integrated voice communication: At each position
- Data control system with recording facility
- UPS of required capacity

FOR DETAILS, PL. SEE " DETAILS OF TECH. SPECS. " ATTACHED

_REQUIREMENTS	COMPLIANCE		REMARKS IF ANY
SYSTEM CAPABILITIES			
-Latest branded equipment of Western origin only, under Windows Operating system	YES	NO	
-The capacity of the processor should be at least quad-core with speed of 2.5 GHz	YES	NO	
-HDD 500GB.	YES	NO	
-The capacity of RAM should be at least 6 GB.	YES	NO	

-The system should have backup facility of software / hardware. -Must have intercom at controller, pilot and supervisor positions.	YES	No.
-Must have printer/strip printer options	YES	No.
-Should have more than 40 radio channels for recording system	YES	NO
-The technical specifications of the Aerodrome Cum Radar Simulator, as given on the attached sheet (Details of Technical Specifications) must be complied with.	YES	NO
-The tower 3D (360 / 270 deg.) VDU does comprise of 08/06 projectors (heavy duty) front projection system respectively.	YES	NO
-Main components specifications along with the country of origin etc. must be mentioned in the technical proposal.	YES	NO
-The bidder will include the cost of fixtures/furniture etc. required for installation of the Simulator, at the site.	YES	NO
TRAINING		
-The bidder shall include the cost, & arrange for Local(on site) / Foreign training (as applicable), for 6 Operational personnel and 3 maintenance personnel. CPDLC & ADS, B training should also be included in the offered system.	YES	NO
FAT and SAT		
-The cost of Factory and site acceptance is included.	YES	NO
-The bidder shall include in the offer, the cost of airfare, accommodation and living expenses, for the factory acceptance test by three persons.	YES	NO
-Warranty for both software and hardware is included till 2 years after commissioning of the system. (Successful bidder shall provide performance bond of 10% of the value).	YES	NO
-Names of cliental with at least 2 references of the offered system outside the country of origin must be mentioned	YES	NO
OTHER TERMS AND CONDITIONS		
-The bidder / OEM must have their local agents / representatives to provide coordination and back up support	YES	NO

as Principal's first contact.		
-After the technical bids, the short listed bidder will be required to arrange a Demo/performance test of offered system at the installed location, before the commercial bids, at bidders cost.	YES	NO
-At least 15 years guaranteed support by the manufacturer for the supply of the system, software, spares and backup support.	YES	NO
-The project must be completed (including training) with in 5 months from the date of LC opening.	YES	NO
-The bidder shall provide Tender security in terms of Bank guarantee / DD / PO / from any Pakistani scheduled bank, equivalent to 2% of the bid value, along with the commercial proposal / bid	YES	NO
-Feeding of data (photographic / numerical / graphical / maps etc of all air-ports including preparation of various exercises both for Aerodrome and Radar Simulator) into the simulator data base, must be undertaken by the experts of OEM at the site, regardless of the security state of Pakistan. Provisioning of software maintenance facility from remote place should also be included	YES	NO
-Compliance sheet submitted by the agent must be verified by the principals and Principals shall provide details of their local agents, while submitting tender documents. These details must be verified by Pakistan Embassy in that country.	YES	NO
-The pseudo pilot positions do have the option to use interlink / Stand alone.	YES	NO
The bidders shall submit their bids on FOB basis.	YES	NO
CRITICAL SPARES		
-A one lot of critical spares with itemized cost (Optional quantity)	YES	NO
-System and applied software backup on appropriate media	YES	NO
-Test and tool package	YES	NO

MANUALS	YES	NO
-System/operators manuals with detailed operational and maintenance techniques are included.		

The bidder should confirm compliance for both 270 and 360 degrees 3 D Aerodrome simulators. Similarly the commercial proposals would also include costing for both types.

CAAP reserves the rights to accept or reject any or all bids/proposals/ tenders



(M. Arshad Malik)

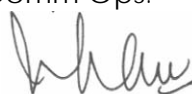
Chief Instructor School Of ATS & Comm Ops.



(Abdul Jabbar)

Chief Instructor

School of Elect. Engg



(Mujahid Islam Khan)

Principal CATI, Hyderabad, Pakistan