

TENDER DOCUMENT

Tele : 27157612 Extn 2103
Fax : 27157534

Army Institute of Technology
Dighi Hills, Alandi Road
Pune-411015

AIT/0810/68/2018-19/Proj

27 Aug 2018

To

TENDERING ENQUIRY FOR UPGRADATION OF STAR-CCM+ CFD SOFTWARE FOR DEPARTMENT OF MECHANICAL ENGINEERING

Sir.

1. Army Institute of Technology, hereinafter referred to as Customer, is interested in procurement of STAR-CCM+ CFD SOFTWARE for Mechanical Department.

(a) Only the enclosed formats (Appendix 'A' to 'C' and its Annexures) in original will be used. All sheets will be submitted duly affixed with the Company's stamp and signature of the authorised signatory of the company. Additional sheets, duly authenticated, may be attached to elucidate specifications or clarify specific issues.

(b) Costs indicated in offer for each item should be the landed cost of the item, giving break up of basic cost of item, excise, all types of taxes specified separately, levies and freight etc.

(c) Cost per unit item considering all the taxes as well as the total costs for the full quantity to be supplied will be indicated.

(d) Technical and commercial offers will be submitted on specific formats enclosed with this tender document in separate envelopes marked "Technical Offer" and "Commercial Offer" respectively.

(e) Only Original Equipment Manufacturer (OEM) or their authorised representative shall quote on behalf of the OEMs. The products being quoted will be OEMs products except where specifically stated in the tender enquiry. If the bidder is not an OEM then bidder quoting the items have to enclose authorisation letters from their principals specifically mentioning this tender reference and confirmation that principals shall give support for warranty & post warranty services with reference to this enquiry. A letter from the OEM is required in the format enclosed in Annexure-I of Appx A.

(f) Incomplete tender are liable to be rejected.

2. Delivery Schedule. Software with necessary installations will be supplied within 2 weeks of placement of Supply Order.

3. Acceptance Testing. The software supplied will be subjected to detailed acceptance testing procedure to test individual components and successful integration of all components in Network. Modalities of the test may be worked out jointly by vendor and the customer. Specifications of the systems supplied shall be checked for the conformity with specifications

given in the supply order. The customers would issue an Acceptance Certificate on successful completion of acceptance testing. The date of issue of Acceptance Certificate shall be deemed to be the date of commencement of warranty.

Payment Terms

4. Payment terms shall be as under: -

(a) 100% payment on receipt of software and on successful commissioning/installation.

(b) In case of Purchase done through custom free payment through CIF, Mumbai payment terms as agreed between the vendor and customer as per laid down norms for such purchase.

5. Performance Bank Guarantee. 10% of the complete Supply Order cost shall remain under Bank Guarantee till the expiry of the warranty as '**Performance Warranty**'. The vendor shall furnish a performance Bank Guarantee equal to ten percent (10%) of the total value of the contract within the 7 days of the receipt of Supply Order. In case of adherence to the delivery schedule for all deliverables of the project as given above in Para 2, liquidated damages as given in para 6 and 7 will be deducted from this amount. **Bank Guarantee will be valid till expiry of the warranty.**

6. Liquidated Damages (LD). If the vendor fails to complete in full all deliveries of software within the stipulated period, in accordance with the, supply order, the vendor shall pay to the Customer AIT, liquidated damages, at the rate of one percent (1%) of the total value of project cost, for each complete week or part thereof for delay up to a maximum of ten percent (10%) of the value of supply order. Thereafter the Customer will have right to terminate the supply order in case or such delay beyond 4 weeks, and the Customer would have the option to buy the hardware/ software/ system and implement the project from the market at the vendors risk and cost. The mode and method of such risk purchase would be at the total discretion of the customer.

7. Method of Payment of Liquidated Damages. The amount charged as liquidated damages shall be deducted by the Customer from the amount due for payment to the Vendor. If the amount of such LD exceeds the payments due to the vendor, the vendors shall within 30 (thirty) days make payment to the customer in full and final settlement of claims failing which the Bank Guarantee will be encashed to make good the amount exceeding the payments due to the vendor.

Warranty and Maintenance Backup

8. Warranty. Vendors will provide free onsite comprehensive warranty for the complete systems Network for a minimum period of one/three years or higher as provided by OEM. Warranty shall include hardware, software and any other pre-loaded software as ordered from the date of acceptance. During the warranty, the vendor will repair/replace without any cost any equipment/part/accessory, which becomes, defective. During the warranty period all warranty benefits received by vendor from the OEMs, for any equipment pertaining to third parties will be passed on in to the Customer. The Customer may invoke the bank guarantee in case vendor fails to ensure rectification of defects within one week of the defect being intimated. Vendor will ensure 99% systems availability during the warranty period. Items of consumable nature that may not be replaced free on account of defect/malfunction must be specified clearly in the offer. Failure to provide this Information shall be treated as all items components consumables are covered under warranty. Software update will be provided free of cost during warranty.

9. System Maintenance During Warranty (If applicable). In order to ensure functionality of systems supplied during warranty period, vendor shall provide System maintenance which would include hardware maintenance and software support. Vendor will provide the following: -

(a) Vendor will ensure that the system continues to perform in exactly the same manner as at the time of acceptance.

(b) Hardware Maintenance. Maintenance of systems should be onsite. Customer may approve if any equipment is required to be move out of site for repairs at the request of vendor. On site vendor will carry out preventive maintenance once every 2 months during warranty period.

10. Software Support Beyond Warranty Period. In order to ensure functionality of system during the life time vendor shall guarantee to provide system support for this entire duration. Vendor will provide the following: -

Commercial / Bought out Software by Vendor. Vendor shall provide all updates/upgrades/patches that may come free of cost from the principles. As and when customer wishes to upgrade commercial software so supplied, vendor shall also provide complete assistance.

11. Conditions during Warranty. The vendor should fulfil the following conditions during the warranty :-

(a) Any failure in the system or a subsystem thereof should be rectified within a maximum period 48 hours of lodging a complaint including loading of operating software if required.

(b) If the system is down beyond 48 hours, penalty at the rate of Rs 500/- (Rs Five hundred only) per day will be charged or recovered out of the Bank Guarantee held towards the warranty. In case of any system/sub system being down for more than seven working days, Customer has the option to get it repaired from any suitable agency at the risk and cost to be borne by the vendor, which will be deducted from the Bank Guarantee due to vendor.

(c) Any system failing at subsystem level three times within a period of three months or displaying chronic faulty behaviour or manufacturing defects or quality control problems will be totally replaced by the vendor at his risk and cost within 30 days of being intimated.

Submission of Offers

12. You are requested to indicate the acceptance of the above offer based on the terms and conditions as given out in the aforesaid paragraphs and anywhere in the tender documents as per Appendix 'C'.

13. You are requested to **submit your offers** as technical and commercial offers, will be **in separate envelopes** marked '**Technical Offer**' and '**Commercial Offer**' respectively. Certificate to be signed, and stamped by authorised signatory of company is also to be attached as per Annexure I to Appendix 'A'. Technical offer should contain Appendixes 'A', 'C' including Annexure and all relevant technical document and commercial offer will consist of Appendix 'B'.

14. Once the supply order is placed, it will be the vendor's responsibility to make the project functional. Any additional cost incurred in installation of hardware/software and for which the vendor has not bid at the time of submission of the final offer will be borne by the vendor.

15. Make, model and version (Latest) will be specified for all items being offered. Complete technical specifications and literature for hardware software pre-loaded or otherwise will be attached with the Technical bid.

16. Any offer received incomplete or ambiguous is likely to be rejected at the discretion of the AIT without recourse to further clarifications. AIT also reserves the right to seek clarifications with one or more vendors if deemed necessary and also not accept any offer at all in case they are not reasonably priced.

17. Any conditions/terms given in the technical or commercial bids by vendors will not be binding on the AIT, Pune. In case the product specifications called in tender are not available technical specification set out in the tender may be changed at the discretion of the customer. The decision of the customer in deciding the technical specification shall be final. All the terms and conditions for the supply, delivery, testing and acceptance, payment, warranty, uptime, penalty will be as given herein and no change in any term or condition by the vendors will be acceptable. Alterations, if any, in the tender documents should be attested properly by the vendor failing which the tender will be rejected. Vendors will not make any assumptions while submitting their bids. If required, clarifications will be sought prior to submission of bids.

18. Withdrawal of offer by vendor after opening of commercial bids shall render the vendor unreliable and out right debar him from attending any further transaction/ negotiations without giving any reason thereof. Proceeding shall be initiated by customer to black list the vendor on this account.

19. Vendors/authorised reps of vendor shall be required to attend the Technical Evaluation Committee (TEC) meeting and Price Negotiation Committee (PNC) meeting. Date and time of such meetings will be intimated from time to time by customer. TEC/PNC reserves the right to disqualify the vendor, due to non-attendance of 'any' of the meeting by the vendor or his representative.

20. Terms and conditions for the procurement are attached as Appendix 'C'. The details of similar project executed by vendor in various Govt/reputed firm may be enclosed. These will be signed by the authorised company representative and stamped with the company stamp.

21. You are requested to send your best offer in the office of the undersigned by **9 Sep 18**. Any offer received after this may be rejected at the discretion of the AIT, Pune. A cheque in favour of 'Army Institute of Technology' for an amount of Rs 250/- has to be enclosed along with the tender as tender money.

22. Please ensure that this is your best and final offer.

(Note. Vendors will submit their technical and commercial bids on the original tender document including appendices and annexure. Photocopies will not be accepted).

Training: Extensive training of 5 Days has to be given to 5 Faculty members from the Department of Mechanical Engineering

Sd/-xxxx
(KE Vijayan)
Col(Retd)
Jt Director
For Director

**TECHNICAL OFFER FOR UPGRADATION OF STAR-CCM + CFD SOFTWARE FOR
DEPARTMENT OF MECHANICAL ENGINEERING**

CFD Software Specifications

CFD Software with **unlimited nodes** (one software or set of bundled modules should have following module-wise capabilities/features for at least **25 users**):

CFD Analysis (Computational Fluid Dynamics Analysis) Capabilities/Features

A. PRE-PROCESSOR (MODELING, MESHING, BOUNDARY CONDITIONS, etc)

- **Geometry**
 - Geometry Creation Tools
 - Features - Solid, Cut, Shell, Wire, Mirror,
 - Datum geometry
 - Partitioning tools
 - Sketch Tools
 - **Geometry Readers** - Faceted geometry & Mesh Reader
 - Geometry Edit Tools
 - Geometry Repair/Simplification/Clean-up Tools
 - **Multi-level undo & redo functionality for geometry**
- **Meshing**
 - **Mesh Types**
 - Volume & Surface meshes
 - Structured & Un-structured meshes
 - Quadrilateral, Triangular, Hexahedral (brick), Cartesian, Tetrahedral, Polyhedral, Prism (wedge), Pyramid, Shell, mixed element meshes (Tetra/Prism hybrid, Hexa hybrid, Quad/tri Shell, etc)
 - **Mesh interfaces** - Conformal & Non-conformal (including fluid/solid)
 - **Geometry Readers** - Faceted geometry & Mesh Reader
 - **Mesh Manipulation (Diagnosis & Repair and editing/generation) Tools** - Translation, Rotation, Scaling, Fusion, Separation, Deletion, Split, Move, Align, Redistribute, Merge nodes or Meshes, Deactivation/Reactivation, Replacement and Appending of cell zones, Smooth, Coarsen, Refine, Extrude, Re-mesh, Stitch, Change projection, Transform, Change Element Types, Renumber, Adjust thickness, Normal, etc
 - **Hybrid Mesh generation Utilities**
 - **Grid-to-grid interpolation**
 - **Dynamic Mesh Modeling**
 - Automatic Handling of Mesh motion & deformation
 - Automatic Refinement/Coarsening using sizing functions
 - Compatible with other physical models/flows
 - In-cylinder mesh motion & crevice/blow by model
 - Dynamic cell addition & deletion
 - Moving Mesh Analysis
 - Mesh motion preview
 - 6DOF solver
 - **Free Surface Modeling**
 - Single velocity field (VoF)
 - Compressive discretization at free surface
 - Surface tension

- Zero gradient boundary conditions for volume fractions for automatic height calculation in subcritical free surface flows
 - Supercritical flow outlets
 - Multiple velocity fields for strong mixing/entrainment with separation
 - **Mesh Motion & Re-meshing**
 - Automatic Handling of Mesh motion & deformation
 - Steady-state and transient
 - Diffusion of prescribed surface mesh motion
 - Increased mesh stiffness for small elements and near-wall mesh
 - Explicit volume mesh deformation
 - Solution-based mesh adaption
 - Integrated re-meshing control
 - **Multi-level undo & redo functionality for meshing & mesh editing action**
 - Queries
- **Materials Models/Properties**
 - User-defined materials and pre-supplied database/Library of materials
 - Constant or Variable Fluid Properties - Temperature & Composition dependent
 - Standard Fluids & Solids
 - Standard reaction mechanisms, Chemical species mixtures, Thermodynamic & Kinetic Properties
 - Particle/droplet data for standard solids, liquids, liquid fuels & coals
 - Equation of state
 - Ideal gas
 - Standard Redlich–Kwong
 - Aungier Redlich–Kwong
 - Soave Redlich-Kwong
 - Peng-Robinson
 - IAPWS IF-97 (water)
 - User defined
 - Specific heat capacity
 - Constant
 - NASA format
 - Fourth-order polynomials
 - User defined
 - Conductivity
 - Sutherlands formula
 - Modified Eucken kinetic theory model
 - User defined
 - Viscosity
 - Sutherlands formula
 - Rigid non-interacting sphere kinetic theory model
 - Rigid interacting sphere kinetic theory model
 - User defined
 - Non-Newtonian Fluid Models
 - Power law
 - Herschel-Bulkley
 - Carreau
 - Cross
 - User-defined law, with temperature-dependent fluid model parameters
 - Non-Newtonian viscosity models
 - Bingham
 - Bird-Carreau
 - Carreau-Yasuda
 - Casson, Cross

- Hershel-Buckley
- Ostwald-de Waele
- User defined
- Antoine equation for vapor pressure curves of pure substances
- Multi-component mixtures
- Electro-magnetic properties
 - Electrical conductivity
 - Magnetic permeability
- Standard Real Gas Model for Refrigerants & Hydrocarbons
- User-defined Real Gas Model for simple & complex equations of state
- Multiple species Model with Real Gas Model
- User-defined Property inputs
- Additional Material Properties
 - Density
 - Material damping
 - Thermal expansion
 - Electrical conductivity
 - Piezoelectric
 - Acoustic medium Properties - Bulk modulus, Volumetric drag, Cavitation limit
 - Porous - acoustic medium
 - Hydrostatic fluid Properties - Hydraulic & Pneumatic fluids
 - Mass diffusion
 - Pore fluid flow
 - Viscous shear behaviour for fluids
 - User-defined materials
- **Materials sections**
 - Fluid section
- **Boundary Conditions**
 - **Inlets**
 - Subsonic, supersonic and mixed (combined subsonic and supersonic)
 - Velocity, mass flow and flow direction, static pressure and direction, total pressure and direction, velocity and static or total pressure (supersonic), static pressure and total pressure and direction (supersonic), zero gradient, Mass fraction for multi-component flow, etc
 - Total temperature, total enthalpy, static temperature
 - Turbulent Kinetic Energy & Dissipation Rate
 - **Outlets**
 - Subsonic, supersonic
 - Mass flow (with pressure profile or circumferential average pressure profile), velocity, uniform static pressure, average static pressure, radial equilibrium pressure distribution, circumferential average static pressure, degassing condition, meridional pressure profile, supercritical, zero gradient
 - **Opening (mixed inflow/outflow)**
 - velocity, total (in)/static (out) pressure and direction, static (in)/static (out) pressure and direction, local flow direction or entrainment, Specified flow rate weighting
 - **Wall**
 - Tangential wall velocity, No slip, free slip, finite slip, specified wall shear, smooth, rough, moving, adiabatic, temperature specified, heat flux specified, heat transfer coefficient and reference temperature specified, opaque, black body, radiation intensity
 - Two-sided walls with optional coupling
 - Fans & Vents
 - Symmetry & Axis Boundary Conditions
 - Thin surfaces/baffles

- 1-D or 2-D profile specifications for any quantity
 - inlet Velocity or Mass flux
- Non-reflecting Boundary Conditions
- Multi-phase Velocity or Mass Flux Boundary Conditions for individual phases
- Specified Pressure Drop Periodic Boundary Conditions
- Ability to copy or reuse Boundary Conditions
- Fixed variable option for Computational Cells
- **General Grid Interfaces**
 - Connection of multiple meshes from independent sources
 - Detailed control of boundary conditions at non-overlapping portions of connections
 - Rasterized or direct mesh intersection algorithms
- **Multi-Domain and Domain Interface Models**
 - Translational and rotational periodic connections (Conformal & Non-conformal)
 - Translational periodic connections with pressure change or mass flow rate
 - Fluid–solid interfaces with pitch and shape change
 - Porous domains with conservative algebraic fluid-porous interfaces
 - Thin surfaces between fluid and solid domains for modeling conduction, thermal contact resistance and coatings, and additional variables transfer
 - Stationary and rotating frames of reference
 - Alternate rotation velocity advection model
 - Multiple frames of reference interface models
 - Stage interface model
 - Frozen rotor interface model
 - Transient rotor/stator interface model
 - Profile Transformation model for transient blade row simulations with pitch change

B. SOLVER-NUMERICAL METHODS/ANALYSIS

- **Numerical Methods**
 - Conservative finite-element-based control volume method
 - Implicit, pressure-based algorithm for all flow speeds, incompressible to compressible
 - Advection modeling
 - Upwind difference advection scheme
 - First- and second-order blend factor
 - High-resolution bounded advection scheme
 - Bounded central difference scheme
 - Robust and accurate diffusion discretization scheme
 - Conservative first- & second-order transient discretization with adaptive transient time stepping
 - High-speed numerics treatment for improved shock capturing
- **Solver Types**
 - Implicit & Explicit
 - Stiff & Non-stiff
 - Pressure-based Solver
 - Density-based Solvers
- **Linear Solver**
 - Coupled solution of mass and momentum, including for multiphase flows (optionally with volume fraction equation)
 - Coupled solution of energy for multiphase flows
 - Coupled solution of additional variables for multiphase flows
 - Algebraic multi-grid
 - Incomplete lower/upper factorization smoother
 - Linear performance with increasing number of nodes

- **Analysis Types**
 - **Flow Types**
 - **Linear Flow**
 - Newtonian & Non-Newtonian
 - Internal & External
 - Compressible (Transonic, Subsonic & Supersonic)& In-compressible
 - Viscous & inviscid flow
 - Laminar & Turbulent
 - Steady-state & Transient
 - Multi-phase Normal & Dispersed
 - Free surface flows & cavitations
 - Reactive flow
 - **Other flows**
 - Buoyancy & rotation
 - Multiple rotation zones
- **Turbulence Modeling**
 - Zero- and one-equation models
 - Two-equation models
 - Reynolds stress transport models (second-moment closure)
 - Explicit algebraic Reynolds stress models
 - Large eddy simulation
 - Scalable wall functions and automatic near-wall treatment with integration to the wall
 - User-defined turbulent wall functions and heat transfer
 - Rough wall treatment for ω -based models, including with transition
 - Curvature correction for swirling flow for two-equation models
 - Detached eddy simulation
 - Scale adaptive simulation
 - Predictive laminar-turbulent transition model
- **Heat Transfer & Radiation Modeling**
 - Thermal energy and total energy
 - Natural convection (buoyancy)
 - Viscous heating
 - Conjugate heat transfer (CHT) solids
 - Porous CHT domains
 - Advection in rotating and translating CHT solids
 - Gray, multi-band, and multi-gray (weighted sum of gray gases) spectral models
 - Spectral material property dependencies
 - Radiation scattering
 - Radiation models (including Solar)
- **Chemical Species Transport , Reaction & Combustion Modeling**
 - User-defined reactions and pre-supplied database of reactions
 - Single- and multi-step eddy dissipation model
 - Finite rate chemistry model
 - Combined EDM/finite rate chemistry, single- and multi-step
 - EDM maximum flame temperature model
 - Flame extinction model
 - Spark and auto-ignition (knock and ignition delay) models
 - Laminar flamelet with presumed PDF model for diffusion flames
 - Premixed/partially premixed combustion (coupled with flamelet PDF for post-flame front mixing and reaction)
 - Burning velocity model

- Extended coherent flame model, including wall quenching model
- Exhaust gas recirculation model
- Weighted reaction progress model for partially premixed combustion
- Choice of predefined or user-defined turbulent and laminar burning velocity correlations
- NOx models
- Magnusson soot model
- Single- or multi-phase combustion
- Coal combustion with proximate/ultimate hydrocarbon fuel analysis
- Chemistry post-processing mode
- Real gas combustion
- Component-dependent turbulent Schmidt numbers
- User-definable turbulent Schmidt and Prandtl numbers

- **Additional User-Defined Transport Equations**
 - Scalar and vector additional variables
 - Advective and diffusive transport
 - Purely diffusive transport
 - Poisson equation
 - User-defined algebraic equation
 - Conjugate additional variables and additional variables in solid domains

- **Lagrangian Particle Tracking Modeling**
 - One-way or fully coupled two-way momentum transfer
 - Steady-state or transient
 - Moving mesh support
 - Detailed control of injection locations, size distributions, etc
 - User-defined and predefined particle drag models
 - Non-drag forces (virtual mass, pressure gradient and turbulent dispersion)
 - Primary breakup models
 - Secondary breakup models
 - Advanced particle-wall interaction
 - Virtual wall model for particle reflections at rough walls
 - Quasi-static wall film model
 - Wall erosion models
 - Stochastic particle-particle collision model
 - Extensive spray penetration diagnostics
 - Convective, latent, and radiative heat transfer
 - Evaporating and boiling single- and multi-component liquid droplets
 - Coal combustion model with proximate/ultimate hydrocarbon fuel analysis
 - Particle track quantities averaged onto fluid mesh
 - User Fortran control of particle injection and particle models
 - Fully parallelized
 - Choice of particle termination criteria

- **Eulerian Multi-phase Flow Modeling**
 - Homogeneous or fluid-dependent
 - Mass and momentum equations
 - Turbulence equations
 - Energy equations
 - Unlimited number of phases
 - Drag force models
 - Non-drag force models
 - Interphase
 - Heat transfer

- Variable transfer
 - Mass transfer
- Multiple size group model for poly-dispersed with breakup and coalescence
- Algebraic slip multiphase model
- **Noise/Acoustics Modeling**
 - Lighthill stress output
 - Export of monopole, dipole and rotating dipole sources for acoustics solvers
- **General Source Term Models**
 - Isotropic and directional loss models
 - Linear and quadratic resistance models
 - Permeability and loss coefficient models
 - User-defined volumetric sources of mass, momentum, energy and species
 - User-defined boundary sources of mass, momentum, energy and species
- **Six Degree-of-freedom Rigid Body Solver**
 - Implicit motion of mesh regions and domains
 - Detailed rigid body solution and coupling control
 - Expression language access to all rigid body state variables
- **Immersed Solids Modeling**
 - Capture of motion of solids completely or partially overlapping with fluid domains - Unlimited general solid motion without re-meshing
 - Implicit motion of immersed solids based on rigid body solver solution
- **Fluid Structure Interaction (FSI) Modeling**
 - One-way FSI coupling with structural mechanics solutions for steady-state analysis
 - Two-way FSI capability for transient or steady-state analysis with moving/deforming geometry
 - Conservative profile-preserving interpolation for fluid dynamic forces and heat flows
- **Fluid-structure Interaction (FSI) Applications Domain Capability**
 - Automotive
 - HVAC
 - Rotating/Turbo Machinery
 - Sensors & Actuators
 - Manufacturing
 - Bio-Medical/Bio-Mechanics
 - Aero-space
 - Under-water Application
 - Chemical/Petrochemical/Petroleum
- **Thermal Analysis**
 - Analysis Types
 - Steady state - Heat transfer & Mass diffusion, Transport Analysis
 - Transient - Heat transfer & Mass diffusion
 - Thermal Modelings
 - Conduction
 - Convection
 - Radiation
 - Conjugate Heat Transfer
 - Phase change
 - Acoustics Analysis

- **Multiphysics/Coupled problems** - Thermo-mechanical, Thermo-electrical, Piezoelectric, Pore fluid flow-mechanical, Shock & structural-acoustic, multi-field general purpose solver
- Co-simulation - Fluid-structure interaction (FST), Conjugate heat transfer (CHT)
- Flow analysis - Incompressible - Laminar & Turbulent
- Coupled Eulerian-Lagrangian

C. POST-PROCESSOR

- **Results**
 - Plots - Contour, Vector/tensor, Iso-surface displays, Slicing Planes (.xls, XML formats)
 - 2D/3D Animation (.avi, .mpeg, .VRML formats)
 - Extraction of results at any location
 - Automatic Result listing & exporting
 - Platform-neutral output database
- **Visualizer**
 - X-Y Plot (Contour, Vector, Iso-surface displays, Slicing Planes, forcing vectors/tensors, etc)
 - Section plots (velocity, pressure, vorticity, temperature, mass fraction, etc)
 - Particle Tracing (2D, 3D Plot)
 - Display of flow trajectory inside/outside or around the model with animated bands, 3D arrows, pipes or spheres
 - Animation (2D, 3D) - .avi, .VRML formats, saving & playback facility
 - Dynamic interference, Collision checking/detection
 - Diagnostic messages
- **Reports**
 - Quantitative Calculations
 - Automation Report generation (.doc, .xls, .bin, .html, .XML formats)
 - 2D/3D Plots/Images (.jpeg, .bmp, .tiff, .png format)
 - Porting of Data - X-Y plots for parts, joints, forces & moments, motions & actuators
 - Data (of inertial loads, gravity, joint forces/moments/torques) for stress analysis
 - System should automatically generate documentation, and these outputs should be in **ASCII** text or **.html** format.

D. INTEGRATED NEUTRAL SIMULATION PLATFORM

- **Optimisation & Design Studies**
 - Topology, shape/geometry, weight optimization
 - DOE
 - Scripting
 - Parametric study
- **Multiple/Integrated Simulations**
 - Performance Testing with
 - Stress and Deflection analysis under dynamic loads
 - Quasi-static Load Predictions
 - Fatigue & Durability Analysis
 - Life Cycle Analysis
 - Drag & drop simulation capabilities
 - Data Porting for Viewing
 - Diagnostic messages
 - Photo-realistic Rendering
- **Control & Co-simulation**
 - In-built Library and Interaction between
 - Mechanical elements
 - Pneumatic elements

- Electrical/Electronic elements
- Mechatronic elements
- Interface for Feedback control (with Simulink/MatLab, LabView, etc)

E. GENERAL REQUIREMENTS

- **File Translators/Reader**
 - **Geometry Translators/Readers**
 - Neutral Translator (IGES, DXF/DWG, STEP, ACIS, STL, VRML, PARASOLID)
 - All types of commercially available solid-modeller data Translators (SolidWorks, SolidEdge, ProE, CATIA, UG, NX, ANSYS, Plot3D, Rhino3D, Viewer XML, CAPRI etc).
 - **Mesh Translators/Readers**
 - Neutral Translator (Input -)(Output-CGNS)
 - Solver Interfaces (ABAQUS, ADAMS, ANSYS, DADS, FLUENT, LS-DYNA, MADYMO, MARC, Matlab/Simulink, MotionSolve, NASTRAN, OptiStruct, PAMCRASH, RADIOSS, Star-CD/CCM)
- **Documentation**
 - Analysis User's Manual
 - Getting Started Manual
 - Example Problems Manuals
 - Interfaces User's Manual
 - Tutorials
 - Release Notes

NOTE:

Please specify

- **Computer Hardware and software**, It must support Windows 8.1 Operating System for the said software installation
- **Supports and Training** to the staff - 5 Day Training
- **Software Support & Update Policy** - Minimum 3Year or greater than 3Year AMC
- **License Policy** - Permanent/Perpetual and Stand-alone/Server based; Please clearly specify License schemes (user-based/ token-based/ task-based, Processor-specific/Core-specific) for parallel/simultaneous use of all capabilities of software from 25 users; and also specify any in-built Cluster-computing schemes developed by software company for advanced/heavy-duty computation.

Note

1. Software should be installable/working on Windows 8.1 Operating System
2. All the modules must come with 3/5 year upgrade and annual maintenance

(ON THE ORIGINAL LETTER HEAD OF THE PRINCIPAL
ORIGINAL EQUIPMENT MANUFACTURER)

To.
Director
AIT
Pune-411015

Sub : Authorisation Letter for Tender No

Due on : _____

Dear Sir,

With reference to the above mentioned tender, we hereby authorized M/s _____ to quote the **STAR – CCM+ CFD SOFTWARE** technically & commercially on our behalf for the above mentioned tender due on _____ for AIT, Pune.

In the event of the order being placed on _____ against the above tender, we hereby guarantee to supply the products as required by them as per the scope of work of the above mentioned tender.

Thanking you,

Yours faithfully.

For _____

(Authorised Signatory)

**COMMERCIAL OFFER FOR UPGRADATION OF STAR – CCM + SOFTWARE FOR
DEPARTMENT OF MECHANICAL ENGINEERING**

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 - Partitioning tools
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 - **Geometry Readers** - Faceted geometry & Mesh Reader
 - **Mesh Manipulation (Diagnosis & Repair and editing/generation) Tools** - Translation, Rotation, Scaling, Fusion, Separation, Deletion, Split, Move, Align, Redistribute, Merge nodes or Meshes, Deactivation/Reactivation, Replacement and Appending of cell zones, Smooth, Coarsen, Refine, Extrude, Re-mesh, Stitch, Change projection, Transform, Change Element Types, Renumber, Adjust thickness, Normal, etc
 - **Hybrid Mesh generation** Utilities
 - **Grid-to-grid interpolation**
 - **Dynamic Mesh Modeling**
 - Automatic Handling of Mesh motion & deformation
 - Automatic Refinement/Coarsening using sizing functions
 - Compatible with other physical models/flows
 - In-cylinder mesh motion & crevice/blowby model
 - Dynamic cell addition & deletion
 - Moving Mesh Analysis
 - Mesh motion preview
 - 6DOF solver
 - **Free Surface Modeling**
 - Single velocity field (VoF)
 - Compressive discretization at free surface
 - Surface tension

- Zero gradient boundary conditions for volume fractions for automatic height calculation in subcritical free surface flows
- Supercritical flow outlets
- Multiple velocity fields for strong mixing/entrainment with separation
- **Mesh Motion & Re-meshing**
 - Automatic Handling of Mesh motion & deformation
 - Steady-state and transient
 - Diffusion of prescribed surface mesh motion
 - Increased mesh stiffness for small elements and near-wall mesh
 - Explicit volume mesh deformation
 - Solution-based mesh adaption
 - Integrated re-meshing control
- **Multi-level undo & redo functionality for meshing & mesh editing action**
- Queries

- **Materials Models/Properties**
 - User-defined materials and pre-supplied database/Library of materials
 - Constant or Variable Fluid Properties - Temperature & Composition dependent
 - Standard Fluids & Solids
 - Standard reaction mechanisms, Chemical species mixtures, Thermodynamic & Kinetic Properties
 - Particle/droplet data for standard solids, liquids, liquid fuels & coals
 - Equation of state
 - Ideal gas
 - Standard Redlich–Kwong
 - Aungier Redlich–Kwong
 - Soave Redlich-Kwong
 - Peng-Robinson
 - IAPWS IF-97 (water)
 - User defined
 - Specific heat capacity
 - Constant
 - NASA format
 - Fourth-order polynomials
 - User defined
 - Conductivity
 - Sutherlands formula
 - Modified Eucken kinetic theory model
 - User defined
 - Viscosity
 - Sutherlands formula
 - Rigid non-interacting sphere kinetic theory model
 - Rigid interacting sphere kinetic theory model
 - User defined
 - Non-Newtonian Fluid Models
 - Power law
 - Herschel-Bulkley
 - Carreau
 - Cross
 - User-defined law, with temperature-dependent fluid model parameters
 - Non-Newtonian viscosity models
 - Bingham
 - Bird-Carreau
 - Carreau-Yasuda
 - Casson, Cross

- Hershel-Buckley
- Ostwald-de Waele
- User defined
- Antoine equation for vapor pressure curves of pure substances
- Multi-component mixtures
- Electro-magnetic properties
 - Electrical conductivity
 - Magnetic permeability
- Standard Real Gas Model for Refrigerants & Hydrocarbons
- User-defined Real Gas Model for simple & complex equations of state
- Multiple species Model with Real Gas Model
- User-defined Property inputs
- Additional Material Properties
 - Density
 - Material damping
 - Thermal expansion
 - Electrical conductivity
 - Piezoelectric
 - Acoustic medium Properties - Bulk modulus, Volumetric drag, Cavitation limit
 - Porous - acoustic medium
 - Hydrostatic fluid Properties - Hydraulic & Pneumatic fluids
 - Mass diffusion
 - Pore fluid flow
 - Viscous shear behaviour for fluids
 - User-defined materials
- **Materials sections**
 - Fluid section
- **Boundary Conditions**
 - **Inlets**
 - Subsonic, supersonic and mixed (combined subsonic and supersonic)
 - Velocity, mass flow and flow direction, static pressure and direction, total pressure and direction, velocity and static or total pressure (supersonic), static pressure and total pressure and direction (supersonic), zero gradient, Mass fraction for multi-component flow, etc
 - Total temperature, total enthalpy, static temperature
 - Turbulent Kinetic Energy & Dissipation Rate
 - **Outlets**
 - Subsonic, supersonic
 - Mass flow (with pressure profile or circumferential average pressure profile), velocity, uniform static pressure, average static pressure, radial equilibrium pressure distribution, circumferential average static pressure, degassing condition, meridional pressure profile, supercritical, zero gradient
 - **Opening (mixed inflow/outflow)**
 - velocity, total (in)/static (out) pressure and direction, static (in)/static (out) pressure and direction, local flow direction or entrainment, Specified flow rate weighting
 - **Wall**
 - Tangential wall velocity, No slip, free slip, finite slip, specified wall shear, smooth, rough, moving, adiabatic, temperature specified, heat flux specified, heat transfer coefficient and reference temperature specified, opaque, black body, radiation intensity
 - Two-sided walls with optional coupling
 - Fans & Vents
 - Symmetry & Axis Boundary Conditions
 - Thin surfaces/baffles

- 1-D or 2-D profile specifications for any quantity
 - inlet Velocity or Mass flux
- Non-reflecting Boundary Conditions
- Multi-phase Velocity or Mass Flux Boundary Conditions for individual phases
- Specified Pressure Drop Periodic Boundary Conditions
- Ability to copy or reuse Boundary Conditions
- Fixed variable option for Computational Cells
- **General Grid Interfaces**
 - Connection of multiple meshes from independent sources
 - Detailed control of boundary conditions at non-overlapping portions of connections
 - Rasterized or direct mesh intersection algorithms
- **Multi-Domain and Domain Interface Models**
 - Translational and rotational periodic connections (Conformal & Non-conformal)
 - Translational periodic connections with pressure change or mass flow rate
 - Fluid–solid interfaces with pitch and shape change
 - Porous domains with conservative algebraic fluid-porous interfaces
 - Thin surfaces between fluid and solid domains for modeling conduction, thermal contact resistance and coatings, and additional variables transfer
 - Stationary and rotating frames of reference
 - Alternate rotation velocity advection model
 - Multiple frames of reference interface models
 - Stage interface model
 - Frozen rotor interface model
 - Transient rotor/stator interface model
 - Profile Transformation model for transient blade row simulations with pitch change

G. SOLVER-NUMERICAL METHODS/ANALYSIS

- **Numerical Methods**
 - Conservative finite-element-based control volume method
 - Implicit, pressure-based algorithm for all flow speeds, incompressible to compressible
 - Advection modeling
 - Upwind difference advection scheme
 - First- and second-order blend factor
 - High-resolution bounded advection scheme
 - Bounded central difference scheme
 - Robust and accurate diffusion discretization scheme
 - Conservative first- & second-order transient discretization with adaptive transient time stepping
 - High-speed numerics treatment for improved shock capturing
- **Solver Types**
 - Implicit & Explicit
 - Stiff & Non-stiff
 - Pressure-based Solver
 - Density-based Solvers
- **Linear Solver**
 - Coupled solution of mass and momentum, including for multiphase flows (optionally with volume fraction equation)
 - Coupled solution of energy for multiphase flows
 - Coupled solution of additional variables for multiphase flows
 - Algebraic multi-grid
 - Incomplete lower/upper factorization smoother

- Linear performance with increasing number of nodes
- **Analysis Types**
 - **Flow Types**
 - **Linear Flow**
 - Newtonian & Non-Newtonian
 - Internal & External
 - Compressible (Transonic, Subsonic & Supersonic)& In-compressible
 - Viscous & inviscid flow
 - Laminar & Turbulent
 - Steady-state & Transient
 - Multi-phase Normal & Dispersed
 - Free surface flows & cavitations
 - Reactive flow
 - **Other flows**
 - Buoyancy & rotation
 - Multiple rotation zones
 - **Turbulence Modeling**
 - Zero- and one-equation models
 - Two-equation models
 - Reynolds stress transport models (second-moment closure)
 - Explicit algebraic Reynolds stress models
 - Large eddy simulation
 - Scalable wall functions and automatic near-wall treatment with integration to the wall
 - User-defined turbulent wall functions and heat transfer
 - Rough wall treatment for ω -based models, including with transition
 - Curvature correction for swirling flow for two-equation models
 - Detached eddy simulation
 - Scale adaptive simulation
 - Predictive laminar-turbulent transition model
 - **Heat Transfer & Radiation Modeling**
 - Thermal energy and total energy
 - Natural convection (buoyancy)
 - Viscous heating
 - Conjugate heat transfer (CHT) solids
 - Porous CHT domains
 - Advection in rotating and translating CHT solids
 - Gray, multi-band, and multi-gray (weighted sum of gray gases) spectral models
 - Spectral material property dependencies
 - Radiation scattering
 - Radiation models (including Solar)
 - **Chemical Species Transport , Reaction & Combustion Modeling**
 - User-defined reactions and pre-supplied database of reactions
 - Single- and multi-step eddy dissipation model
 - Finite rate chemistry model
 - Combined EDM/finite rate chemistry, single- and multi-step
 - EDM maximum flame temperature model
 - Flame extinction model
 - Spark and auto-ignition (knock and ignition delay) models
 - Laminar flamelet with presumed PDF model for diffusion flames

- Premixed/partially premixed combustion (coupled with flamelet PDF for post-flame front mixing and reaction)
 - Burning velocity model
 - Extended coherent flame model, including wall quenching model
- Exhaust gas recirculation model
- Weighted reaction progress model for partially premixed combustion
- Choice of predefined or user-defined turbulent and laminar burning velocity correlations
- NOx models
- Magnusson soot model
- Single- or multi-phase combustion
- Coal combustion with proximate/ultimate hydrocarbon fuel analysis
- Chemistry post-processing mode
- Real gas combustion
- Component-dependent turbulent Schmidt numbers
- User-definable turbulent Schmidt and Prandtl numbers

- **Additional User-Defined Transport Equations**
 - Scalar and vector additional variables
 - Advective and diffusive transport
 - Purely diffusive transport
 - Poisson equation
 - User-defined algebraic equation
 - Conjugate additional variables and additional variables in solid domains

- **Lagrangian Particle Tracking Modeling**
 - One-way or fully coupled two-way momentum transfer
 - Steady-state or transient
 - Moving mesh support
 - Detailed control of injection locations, size distributions, etc
 - User-defined and predefined particle drag models
 - Non-drag forces (virtual mass, pressure gradient and turbulent dispersion)
 - Primary breakup models
 - Secondary breakup models
 - Advanced particle-wall interaction
 - Virtual wall model for particle reflections at rough walls
 - Quasi-static wall film model
 - Wall erosion models
 - Stochastic particle-particle collision model
 - Extensive spray penetration diagnostics
 - Convective, latent, and radiative heat transfer
 - Evaporating and boiling single- and multi-component liquid droplets
 - Coal combustion model with proximate/ultimate hydrocarbon fuel analysis
 - Particle track quantities averaged onto fluid mesh
 - User Fortran control of particle injection and particle models
 - Fully parallelized
 - Choice of particle termination criteria

- **Eulerian Multi-phase Flow Modeling**
 - Homogeneous or fluid-dependent
 - Mass and momentum equations
 - Turbulence equations
 - Energy equations
 - Unlimited number of phases
 - Drag force models
 - Non-drag force models

- Interphase
 - Heat transfer
 - Variable transfer
 - Mass transfer
- Multiple size group model for poly-dispersed with breakup and coalescence
- Algebraic slip multiphase model

- **Noise/Acoustics Modeling**
 - Lighthill stress output
 - Export of monopole, dipole and rotating dipole sources for acoustics solvers

- **General Source Term Models**
 - Isotropic and directional loss models
 - Linear and quadratic resistance models
 - Permeability and loss coefficient models
 - User-defined volumetric sources of mass, momentum, energy and species
 - User-defined boundary sources of mass, momentum, energy and species

- **Six Degree-of-freedom Rigid Body Solver**
 - Implicit motion of mesh regions and domains
 - Detailed rigid body solution and coupling control
 - Expression language access to all rigid body state variables

- **Immersed Solids Modeling**
 - Capture of motion of solids completely or partially overlapping with fluid domains - Unlimited general solid motion without re-meshing
 - Implicit motion of immersed solids based on rigid body solver solution

- **Fluid Structure Interaction (FSI) Modeling**
 - One-way FSI coupling with structural mechanics solutions for steady-state analysis
 - Two-way FSI capability for transient or steady-state analysis with moving/deforming geometry
 - Conservative profile-preserving interpolation for fluid dynamic forces and heat flows
- **Fluid-structure Interaction (FSI) Applications Domain Capability**
 - Automotive
 - HVAC
 - Rotating/Turbo Machinery
 - Sensors & Actuators
 - Manufacturing
 - Bio-Medical/Bio-Mechanics
 - Aero-space
 - Under-water Application
 - Chemical/Petrochemical/Petroleum

- **Thermal Analysis**
 - Analysis Types
 - Steady state - Heat transfer & Mass diffusion, Transport Analysis
 - Transient - Heat transfer & Mass diffusion
 - Thermal Modelings
 - Conduction
 - Convection
 - Radiation
 - Conjugate Heat Transfer
 - Phase change

- Acoustics Analysis
- **Multiphysics/Coupled problems** - Thermo-mechanical, Thermo-electrical, Piezoelectric, Pore fluid flow-mechanical, Shock & structural-acoustic, multi-field general purpose solver
- Co-simulation - Fluid-structure interaction (FST), Conjugate heat transfer (CHT)
- Flow analysis - Incompressible - Laminar & Turbulent
- Coupled Eulerian-Lagrangian

H. POST-PROCESSOR

- **Results**
 - Plots - Contour, Vector/tensor, Iso-surface displays, Slicing Planes (.xls, XML formats)
 - 2D/3D Animation (.avi, .mpeg, .VRML formats)
 - Extraction of results at any location
 - Automatic Result listing & exporting
 - Platform-neutral output database
- **Visualizer**
 - X-Y Plot (Contour, Vector, Iso-surface displays, Slicing Planes, forcing vectors/tensors, etc)
 - Section plots (velocity, pressure, vorticity, temperature, mass fraction, etc)
 - Particle Tracing (2D, 3D Plot)
 - Display of flow trajectory inside/outside or around the model with animated bands, 3D arrows, pipes or spheres
 - Animation (2D, 3D) - .avi, .VRML formats, saving & playback facility
 - Dynamic interference, Collision checking/detection
 - Diagnostic messages
- **Reports**
 - Quantitative Calculations
 - Automation Report generation (.doc, .xls, .bin, .html, .XML formats)
 - 2D/3D Plots/Images (.jpeg, .bmp, .tiff, .png format)
 - Porting of Data - X-Y plots for parts, joints, forces & moments, motions & actuators
 - Data (of inertial loads, gravity, joint forces/moments/torques) for stress analysis
 - System should automatically generate documentation, and these outputs should be in **ASCII** text or **.html** format.

I. INTEGRATED NEUTRAL SIMULATION PLATFORM

- **Optimisation & Design Studies**
 - Topology, shape/geometry, weight optimization
 - DOE
 - Scripting
 - Parametric study
- **Multiple/Integrated Simulations**
 - Performance Testing with
 - Stress and Deflection analysis under dynamic loads
 - Quasi-static Load Predictions
 - Fatigue & Durability Analysis
 - Life Cycle Analysis
 - Drag & drop simulation capabilities
 - Data Porting for Viewing
 - Diagnostic messages
 - Photo-realistic Rendering
- **Control & Co-simulation**
 - In-built Library and Interaction between
 - Mechanical elements

- Pneumatic elements
- Electrical/Electronic elements
- Mechatronic elements
- Interface for Feedback control (with Simulink/MatLab, LabView, etc)

J. GENERAL REQUIREMENTS

- **File Translators/Reader**
 - **Geometry Translators/Readers**
 - Neutral Translator (IGES, DXF/DWG, STEP, ACIS, STL, VRML, PARASOLID)
 - All types of commercially available solid-modeller data Translators (SolidWorks, SolidEdge, ProE, CATIA, UG, NX, ANSYS, Plot3D, Rhino3D, Viewer XML, CAPRI etc).
 - **Mesh Translators/Readers**
 - Neutral Translator (Input -)(Output-CGNS)
 - Solver Interfaces (ABAQUS, ADAMS, ANSYS, DADS, FLUENT, LS-DYNA, MADYMO, MARC, Matlab/Simulink, MotionSolve, NASTRAN, OptiStruct, PAMCRASH, RADIOSS, Star-CD/CCM)
- **Documentation**
 - Analysis User's Manual
 - Getting Started Manual
 - Example Problems Manuals
 - Interfaces User's Manual
 - Tutorials
 - Release Notes

NOTE:

Please specify

- **Computer Hardware and software**, It must support Windows 8.1 Operating System for the said software installation
- **Supports and Training** to the staff - 5 Day Training
- **Software Support & Update Policy** - Minimum 3Year or greater than 3Year AMC
- **License Policy** - Permanent/Perpetual and Stand-alone/Server based; Please clearly specify License schemes (user-based/ token-based/ task-based, Processor-specific/Core-specific) for parallel/simultaneous use of all capabilities of software from 25 users; and also specify any in-built Cluster-computing schemes developed by software company for advanced/heavy-duty computation.

Note

1. Software should be installable/working on Windows 8.1 Operating System
2. All the modules must come with 1/3 year upgrade and annual maintenance

ACCEPTANCE OF TERMS AND CONDITIONS FOR UPGRADATION OF STAR – CCM + CFD
SOFTWARE FOR DEPARTMENT OF MECHANICAL ENGINEERING

1. Validity : Vendor confirms that the prices are valid upto _____
2. Payment Terms
 - (a) 100% payment on receipt of stores and on successful commissioning/ installation.
 - (b) In case of Purchase done through custom free payment through CIF, Mumbai payment terms as agreed between the vendor and customer as per laid down norms for such purchase.
3. Performance Clause. The vendor shall furnish a performance Bank Guarantee equal to five percent (10%) of the total value of the contract within seven days of receipt of supply order. In case of non-adherence to the delivery schedule for all deliverables of the project as provided In the Tender Document, liquidated damages as provided in the Tender document will be deducted from this amount. Bank guarantee will be valid till the expiry of the warranty.
4. Delivery Period. 2 weeks after receipt of Purchase Order.
5. Liquidated Damage. If the vendor fails to complete in full, all deliveries of hardware, commercial software within the stipulated period, in accordance with this supply order, the vendor shall pay to the Customer- AIT liquidated damages, at the rate of one percent (1%) of the total value, for each complete week or part thereof, of delay upto to a maximum of ten percent (10%) of the value of supply order. Thereafter the CUSTOMER will have right to terminate the supply order in the case of such delay beyond 4 weeks, and the buyer would have the option to buy the hardware and commercial software form the market at the vendors risk & cost. The mode and method of such risk purchase would be at the total discretion of the Customer- AIT.
6. Calculation of Liquidated Damages Liquidated damages will be calculated and will be deducted out of the payments due to the vendor at the discretion of the customer.
7. Method of Payment Liquidated Damages The amount charged as liquidated damages shall be deducted by the Customer from the amount due for payment to the Vendor. If the amount or such LD exceeds the payments due to the Vendor, the Vendor shall within 30 (thirty) days make payment to the customer in full and final settlement of claims failing which the Bank Guarantee will be encashed to make good the amount exceeding the payment due to the vendor.
8. Acceptance Testing Procedure The system once installed will be subjected to an acceptance testing procedure to test individual components of systems supplied. The details of the procedure will be worked out jointly between the vendor and the customers before the finalisation of the contract. The specifications of the equipment will be in conformity with the details provided in the tender. The customer will issue an Acceptance Certificate on successful completion of acceptance testing.
9. Warranty. Vendor confirms acceptance of terms set out at Tender Document. The date of issue the acceptance certificate would be deemed to be the date on which the Warranty will commence. The vendor will provide on site comprehensive warranty for the period specified and agreed upon for hardware system software, peripherals and functioning of Network from the date at acceptance at the site.
10. The vendor will abide by the delivery schedule as laid out in Paragraph 4 above and elsewhere in the Tender Document.

11 All prices will be the landed costs and shall give break up basic cost, excise local taxes, levies, freight etc (as per format attached with document). All hard items for which Excise duty is applicable at varied rates will be specified in Commercial bid. Vendor will responsible to produce excise duty certificate in respect of all such items, whether manufactured by vendor or otherwise. Delivery of all goods shall be at Customer's premises.

CERTIFICATE

It is certified that all the terms and conditions as laid down in the above paragraphs and anywhere else in the Tender Document and its appendices are accepted by the Company and we will abide by them. It is further certified that any cost incurred on additional hardware & software would be borne by vendors.

Company Seal

(Authorised Signatory of OEM/Vendor/Company)

Place _____

Date _____

No _____

To,

Director

AIT

Pune-411015

CERTIFICATE OF ACCEPTANCE AND TERMS AND CONDITIONS

(To Be Furnished on Receipt of Supply Order)

Through

Sir,

1. Receipt is acknowledged of your Supply Order No _____ dated _____ together with enclosures.

2. We hereby agree to supply the said items as per the terms and conditions contained therein.

Yours faithfully

(Name & Designation of the officer signing this)

(To be signed by Vendor/Suppliers)