

STATEMENT OF WORK

1. Work package Name & Description:

SN	Description of the package	Quantity	Unit
1.	Outsourcing for Detail Design activities of Drop tanks for LCA AF Mk2 Fighter Aircraft.	1	Job

2. Introduction:

2.1. LCA AF Mk2 aircraft carries external fuel tanks to increase its range.

2.2. This work package is intended to outsource the design tasks, such as CAD models & Drawings generation for metallic part, sheet metal parts, composite parts, sub assembly drawings, assembly drawings.

2.3. This work package is to be executed at Airframe Dte., ADA.

2.4. Delivery of this work package through outsourcing of design activities is planned for a period of 12 months.

3. Technical Details:

3.1. The tasks cover structural detail design, with generation of CAD models and manufacturing drawings. The task also involves estimation of mass properties and documentation towards certification.

3.2. The work package is to be executed with the aid of aircraft industry standard design / analysis software tools & in-house software tools as well. The tasks are to be executed as per ADA design standards.

3.3. ADA would provide the place of work and necessary resources like design software tools, servers, workstations, personal computers and applicable standards.

3.4. ADA would provide necessary reference technical data such as design standards, reference drawings, CAD models etc. for executing these tasks as the case may be.

4. Scope of work:

The vendor has to complete the design activities related to two variants of drop tanks viz. 1700 Ltrs and 1300 Ltrs Drop Tanks comprising the following tasks.

4.1 Preparation of Composite part models and drawings of 1700 Ltrs Drop Tank

The description of tasks involved in the preparation of composite part drawings milestone 1 is provided in Table 4.1 below.

TABLE-4.1: List of Tasks for preparation of composite part drawings

Task No.	Description
T4.1: Detail Design Tasks of Composite parts of 1700 Ltrs Drop Tank	
1.	Familiarization of work, design standards, training etc.

2.	Checking of Numerical master geometry (NMG).
3.	Preparation of 3D structural layout of 1700 Ltrs Drop Tank.
4.	Preparation of 3D models and 2D conventional Drawings for composite parts in CATIA.
5.	Carryout the Quality checks on the 3D composite models in the assembly and correct the models if required to meet the standards
6.	Carryout of Tolerance Stack up analysis on the critical composite parts
7.	Generation of the LLTI Stock size report and material estimation
8.	Preparation of material schedules of composite parts

4.2 Preparation of Composite part models & drawings of 1300 Ltrs Drop Tank and metallic part model & drawings of 1700 Ltrs Drop Tank

The description of tasks involved in the preparation of composite part drawings and metallic part drawings in milestone 2 is provided in Table 4.2 below.

TABLE-4.2: List of Tasks for preparation of composite and metallic part drawings

Task No.	Description
T4.2A: Detail Design Tasks of 1700 Ltrs Drop Tank metallic parts	
1.	Preparation of 3D models and Drawings for machined and sheet metal parts in CATIA.
2.	Carryout the Quality checks on the 3D models in the assembly and correct the models if required to meet the standards
3.	Carryout of Tolerance Stack up analysis on the critical components.
4.	Generation of the LLTI Stock size report & material estimation.
T4.2B: Detail Design Tasks of 1300 Ltrs Drop Tank Composite Parts	
1.	Checking of Numerical master geometry (NMG).
2.	Preparation of 3D structural layout of 1300 Ltrs Drop Tank.
3.	Preparation of 3D models and 2D conventional Drawings for composite parts in CATIA.
4.	Carryout the Quality checks on the 3D composite models in the assembly and correct the models if required to meet the standards
5.	Carryout of Tolerance Stack up analysis on the critical composite parts
6.	Generation of the LLTI Stock size report and material estimation
7.	Preparation of material schedules of composite parts

4.3 Preparation of Metallic Parts Model & Drawings of 1300 Ltrs Drop Tank and Preparation of Model and drawings of LRUs bracketry and pipelines of 1300 Ltrs Drop Tank and 1700 Ltrs Drop Tank

The description of tasks involved in the preparation of Metallic part drawings and LRUs bracketry and pipelines drawings as under milestone 3 is provided in Table 4.3 below.

TABLE-4.3: List of Tasks for preparation of Metallic parts, LRUs bracketry and Pipeline drawings

Task No.	Description
T4.3A: Detail Design Tasks of 1300 Ltrs Drop Tank metallic parts	
1.	Preparation of 3D models and Drawings for machined and sheet metal parts in CATIA.
2.	Carryout the Quality checks on the 3D models in the assembly and correct the models if required to meet the standards
3.	Carryout of Tolerance Stack up analysis on the critical components.
4.	Generation of the LLTI Stock size report & material estimation.
T4.3B: Detail Design Tasks of LRUs bracketry and pipelines of 1300 Ltrs Drop Tank	
1.	Preparation of 3D models and Drawings for LRUs bracketry.
2.	Preparation of 3D models and Drawings for Pipelines using 3D Nodes in CATIA.
3.	Carryout the Quality checks on the 3D models in the assembly and correct the models if required to meet the standards.
T4.3C: Detail Design Tasks of LRUs bracketry and pipelines of 1700 Ltrs Drop Tank	
1.	Preparation of 3D models and Drawings for LRUs bracketry.
2.	Preparation of 3D models and Drawings for Pipelines using 3D Nodes in CATIA.
3.	Carryout the Quality checks on the 3D models in the assembly and correct the models if required to meet the standards.

4.4 Preparation of Sub assembly and Assembly Drawings of 1300 Ltrs and 1700 Ltrs Drop Tank

The description of tasks involved in the preparation of sub assembly and assembly drawings as under milestone 4 is provided in Table 4.4 below.

TABLE-4.4: List of Tasks for release of assemblies and installation Drawings

Task No.	Description
T4.4A: Detail Design Tasks of Sub Assembly and Assembly drawings of 1700 Ltrs Drop Tank	
1.	Preparation of sub-assembly and Assembly models & drawings and generation of their Material Schedules
2.	Preparation of Schedule for fasteners and standard parts
3.	GD&T analysis, Clearance, Clash & Contact analysis for critical assemblies, Fitting simulation and kinematic analysis for various aircraft components.
4.	Carryout the Quality checks on the 3D models in the assembly and correct the models if required to meet the standards
5.	Carryout of Tolerance Stack up analysis on the critical components and assemblies
6.	Preparation of Assembly sequence – Multiple Iterations – Creation of Fitting Simulation
7.	Generation of Fasteners report, Seal Caps report, Estimation of Fastener weight and quantity.
8.	Preparation of CAD models for sealants and estimation of weight
T4.4B: Detail Design Tasks of Sub Assembly and Assembly drawings of 1300 Ltrs Drop Tank	
1.	Preparation of sub-assembly and Assembly models & drawings and generation of their Material Schedules

2.	Preparation of Schedule for fasteners and standard parts
3.	GD&T analysis, Clearance, Clash & Contact analysis for critical assemblies, Fitting simulation and kinematic analysis for various aircraft components.
4.	Carryout the Quality checks on the 3D models in the assembly and correct the models if required to meet the standards
5.	Carryout of Tolerance Stack up analysis on the critical components and assemblies
6.	Preparation of Assembly sequence – Multiple Iterations – Creation of Fitting Simulation
7.	Generation of Fasteners report, Seal Caps report, Estimation of Fastener weight and quantity.
8.	Preparation of CAD models for sealants and estimation of weight

4.4. Requirement Generation:

4.4.1. ADA would generate task requirements time to time and provide necessary inputs for the tasks listed above.

4.4.2. For all the Milestones, Inputs and Deliverables are given in the Table-7 at section - 7.

4.4.3. The Vendor shall provide support, feedback on inconsistencies, if any, prior to proceeding with the work in each Milestone.

4.5. Acceptance and Declaration of Completion of Milestone:

4.5.1 The vendor shall have carried out / completed / submitted the reports for the tasks as enumerated above relevant to the scope of work.

4.5.2 The vendor shall have completed all activities that are defined in the Milestone.

4.5.3 Correctness of the data generated shall be demonstrated by Vendor and accepted by ADA.

4.6. Management of Vendor team at ADA:

4.6.1. The Vendor shall be completely responsible for

4.6.1.1. Deploying sufficient man power with required technical skill set.

4.6.1.2. The completion of work as per milestone given by ADA.

4.6.1.3. Scheduling / plan of usage of available resources which are allocated for this work at ADA premises.

4.6.1.4. Ensuring that the absence / leaves of employees of the Vendor shall not affect the deliverables in any way.

4.6.1.5. Ensuring that the team deployed at ADA is stable, consistent and attrition if any, does not affect the deliverables.

4.6.1.6. Timely delivery of the deliverables in each Milestone period.

5. Skill set required:

5.1. The tasks are mainly design tasks and Quality requirements for this task is indicated in the Table-5 below.

5.2. It is expected that the vendor deploys skilled manpower in the areas where respective task demands for. Common mandatory skill sets include familiarity with Microsoft office tools – Excel, Word & Power point, MS Project, quantitative & analytical abilities and basic communication skills. The experience and required skill set is indicated in Table-5.

5.3. ADA is of the opinion that minimum team strength of 4 engineers with indicated expertise level shall be deployed for execution of tasks effectively. The progress of the tasks requires optimum deployment of technical team members in staggered manner distributed over 12 months.

Table-5: Required Qualifications & Skill set for executing the tasks:

For	Essential Qualifications	Relevant Experience	Skill set
T4.1 to T4.4	Essential: BE / B.Tech(Mechanical); Desirable: M.Tech. (Mechanical)	For BE/B.Tech: Min. 3 years For MTech: Min. 1 year in detail design of aerospace structural parts.	Expertise in generating 3D models and drawings using any of CATIA/SOLIDWORKS/ Unigraphics ENOVIA VPM, TEAM CENTER; Knowledge of GD&T.

5.6. The eligibility of all members of the vendor's team shall be evaluated by a team from ADA, for domain knowledge, skillsets and academic qualifications. Any change in human resource allocated to this project would be with the prior approval of ADA Project Coordinator, and should have an overlap of at least 03 weeks between the outgoing and incoming personnel.

5.7. During Milestone-1, one time training would be imparted to make the Vendor team understand and get familiarized with the project, process and work flow. To take full advantage of the privilege, the vendor shall place entire team, intended for the work at ADA, at once. At a later stage, it shall be the responsibility of the Vendor to train any new resources.

6. Execution Plan:

6.1. The vendor shall deploy required skilled manpower at Detail Design group, ADA.

6.2. Resources such as work station, software etc. shall be provided by ADA to the deployed team which will report to respective team leader.

6.3 Inputs from ADA to carry out Milestone would be provided prior to start of Milestone.

6.4. The vendor shall release the work done report regularly at the end of each milestone which needs to be coordinated by ADA coordinator.

6.5.The Vendor is eligible for milestone payment upon successful completion of the milestone duly certified by the project coordinator.

6.6. There shall be a single point contact (Project Coordinator) from the vendor side for this work package, who will be coordinating with single point coordinator from ADA.

7. Milestones:

7.1. The milestones for whole work package and corresponding % of payment release to the vendor are listed in Table 7 below.

Table-7: Milestones Definition:

Milestone	Activity	Deliverables	Timeline for completion	Payment in % of total contract value
Milestone-1	List of the tasks as per para 4.1	- Entire team to be deployed; - Composite part models and drawings of 1700 Ltrs Drop Tank	T ₀ +3M	20%
Milestone-2	List of the tasks as per para 4.2	-Composite part models and drawings of 1300 Ltrs Drop Tank -Metallic parts models and drawings of 1700 Ltrs Drop Tank	T ₀ +6M	25%
Milestone-3	List of the tasks as per para 4.3	-Metallic parts models and drawings of 1300 Ltrs Drop Tank -Model and drawings of LRUs bracketry and pipelines of 1300 Ltrs Drop Tank -Model and drawings of LRUs bracketry and pipelines of 1700 Ltrs Drop Tank	T ₀ +9M	35%
Milestone-4	List of the tasks as per para 4.4	-Sub assembly and Assembly drawings of 1700 Ltrs Drop Tank -Sub assembly and Assembly drawings of 1300 Ltrs Drop Tank	T ₀ +12M	20%
Total Payment:				100%

9. Execution, Responsibility, Timeline and Payment:

9.1. This contract will be a fixed price contract, spanned over one year (12 months).

9.2. The payment would be made based on milestone achieved, and would be paid upon completion of respective milestone.

10. Other Terms:

10.1. If manpower deployed for the defined tasks found to be incapable / unsuitable and need replacement, vendor shall replace the same with alternate better skilled personnel.

10.2. Vendor shall deploy the man power after taking concurrence from ADA and share the resumes of such personnel. If group leader finds that skill set prescribed for personnel is not meeting task requirement, vendor shall replace such personnel with alternate personnel with requisite skill set.

10.3. If personnel employed at ADA resign from parent company, then work package vendor shall ensure replacement with alternate personnel with equivalent skill set.

10.4. Work package personnel shall report to ADA project coordinator.

10.5. Work package personnel shall be registered employee of vendor at the time of deployment.
