LIBERTY Galati
Projects Department
9400/425/02.05.2023

TECHNICAL SPECIFICATION

COILS AERIAL TILTER HANDLING DEVICE

LIBERTY GALATI

Contracted works: *Engineering, manufacturing, erection and commissioning*

Project monitored by:

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SUMMARY

FOREWORD

LIBERTY Galati plant is called hereinafter, the COMPANY.

The bidder is called hereinafter, the PROVIDER.

In this Technical Specification, the installations represent the new coils aerial tiller handling device for P18K crane

The COMPANY, within its project aims to implement the new equipment to serve P18K crane for a new cut to length line.

The compliance with this Technical Specification from the part of the PROVIDER represents a commitment for results.

The PROVIDER, within his commitment for results, will ensure that the equipment object of his work, and all the materials to be delivered by him, comply perfectly with enforced laws, decrees and standards, especially regarding safety and environment, as well as with internal regulations of the COMPANY.

Within the contracted work, the PROVIDER will strictly comply with IT DP 045 "General rules to be applied by LIBERTY contractors" as well as with all the objectives of the latter.

1. OBJECT OF CONTRACTED WORK

- The main objects of contracted works for the coils aerial filter handling device are:
  - ✓ Engineering
  - ✓ Manufacturing
  - ✓ Erection on site
  - ✓ Commissioning &Training.

The work executed by the PROVIDER will include in particular:

- The equipment design
- Basic and detailed engineering
- The surveys and checking activities of the actual equipment drawings
- The general studies and the detailed studies
- The supply and the provisions
- Manufacturing and assembling in the workshop
- Preliminary erection and workshop tests
- The factory acceptance tests
- Packing, loading, transport, dispatching, unloading, delivery on site
- The performance of interfaces connections with the actual installations and with other project lots
- The development of on-site Tests, including the Performance Tests
- The regulatory tests
- The management and coordination of on-site Tests, taking into consideration all the operating constraints
- Assistance in the Industrial Commissioning until reaching the contractual performances
- Training of COMPANY's personnel
- Getting the Romanian institutions (ISCIR Romania), the functioning authorization for the equipment
- The complete documentation, in Romanian and English, necessary for operation and maintenance of the Equipment

All supplies of parts, materials and matters, all transports, all loading and unloading operations, all servicing equipment's, all protection equipment, all works, drawings and compliances related to the object of this technical specification and to the achievement of results expected by the COMPANY are exclusively in the scope of the PROVIDER.

The PROVIDER is the sole responsible for the solutions implemented in order to guarantee the proper operation of his installation and to obtain the results and functionalities expected by the COMPANY.

The PROVIDER will execute in his workshop the maximum of required pre-fabrications

The PROVIDER, in the scope of his work will have to strictly comply with the following principles:

- *Define, conceive, supply and commission the assembly of equipment's described in this specification, in order to guarantee a perfect start of the installation.*
- *Conceive the installation and its organization, in order to guarantee the safety and to minimize the execution difficulties of his work, by complying with the environmental standards.*
- *Obtain the results expected and defined by the COMPANY*
- *Improve the reliability, availability, maintainability of equipment's which were modified, adapted, replaced and / or related with the execution of contracted work*
- *Integrate the contracted work in the planning of the COMPANY*
- *Inform the COMPANY, on regular basis, about achieved results*

2. CHARACTERISTICS OF THE INSTALLATION INTERFACING WITH THE CONTRACTED WORK AND LOCATIONS FOR THE EXECUTION OF CONTRACTED WORK

2.1 SITE CONSTRAINTS

The installation is located on the site of the COMPANY, in GALATI ROMANIA, Dispatching Shop from HSM

The PROVIDER, while executing the work, will take into account the constraints applying to the site of the COMPANY', defined in IT DP 045 "General rules to be applied by LIBERTY contractors".

2.1.1 Constraints specific to the working environment of the equipment

The PROVIDER, during the execution of work, will also take into consideration the following specific constraints:

- Last earthquake observed in the area: 30.08.1986 = 7, 1° Richter, 30.05.1990 = 6, 9° Richter, 31.05.1990 = 6, 4 ° Richter, 27.10.2004 = 6 ° Richter
- Galati is located in Earthquake Risk Zone Level VII on Mercalli scale.
- *Installation located indoors:*
  - *minimum / maximum temperature: - 20°C ... + 40°C*
  - *relative humidity at 20°C: 80%*
  - *the presence of dust in the air, aggression class 3m according to STAS 10128-88;*
- *Temperature of the rollers handled:*
- *The temperature of the coils: - 20°C ... + 550°C*
- *Presence of gas*
- *Movement of handling and transport equipment's*
- *Works performed on the installation during operation or while out of order*

2.2 INSTALLATION INTERFACING WITH THE CONTRACTED WORK

The P1SK crane is installed in Dispatching Shop, C-D bay, from HSM area.
Commissioning => Q3 2020

2.3 DESCRIPTION OF INSTALLATION

The control of the equipment is made by remote control.
The equipment is predisposed for the following manoeuvres (by means of the push button of the remote control):

- ✓ opening clamping jaws;
- ✓ closing clamping jaws;
- ✓ left tilting;
- ✓ right tilting;
- ✓ left rotation;
- ✓ right rotation.

The device must be manufactured to raise the steel coils and tilt them vertically and horizontally to be stored
Spring roller (recovery drum) for electrical power supply device – scope supplier
Mechanisms and carpentry. Class F.E.M. A5 - M7, Spectra of load Q3-U4
Handled roll weight: 18 – 27,6 to

2.3.1 Coils to be handled data

- Coils sizes:
  - Width (in mm): 870 – 1600
  - Internal diameter (in mm): min 740 max 850
  - External diameter (in mm): min 1350 max 2100
  - Weight: maxim 28 to
- Coils surface: Dry and Black
- **Coils temperature (at handling time):**
  - usually - up to maxim 100°C (**minimum acceptable range**)
  - rarely - up to maximum 450°C

- very rarely - up to maximum 600°C
- **the higher the maximum temperature for handling coils guaranteed** – the better technical score of the offer will be consider

Constraints specific to the working environment of the equipment

- minimum / maximum bay temperature: - 15°C ...+ 45°C
- relative humidity at 20°C: 80%
- radiations from coils
- dust in the air, 3m aggressiveness class according to STAS 10128-86

2.3.2 Operational overhead crane data

- Nominal load – 50 to
- Span: 34 m
- Mechanical classification: M7
- Height of the crane railways: 11,85 m
- Lifting height: 9,50 m
- Foreseen with muffle with hook (see attached drawing)
- Hook of the crane P1SK dimensions – according to the drawing 5.12.001.129 (attached)
- Lift / lower speed (adjustable via converter): 12,5 m/min
- Travel speed for trolley (adjustable via converter): 50 m/min
- Travel speed for crane (adjustable via converter: 110 m/min
- Source of energy: 3x380V; 50Hz
- Crane drive system on frequency converters
- Railway type for crane: KP100

2.4 TOPOGRAPHY – SITUATION OF LOCATIONS – VERIFICATION OF GENERAL LAYOUTS OF THE COMPANY

The PROVIDER, prior to the execution of contracted work, will conduct one or several visits of concerned locations in order to specifically verify the accuracy of layouts of existing installation including the span between the rails.

All visits of locations will take place in the presence of a member of the COMPANY.

The Equipment supplied by the PROVIDER must be, in any case, compatible with existing structures rather than with the layouts of the COMPANY, if due to any reasons the latter will prove to be inaccurate.

3. DESIGN INPUTS AND RULES FOR CONCEPTION, CONSTRUCTION AND CALCULATIONS

3.1 DESIGN SUMMARY INPUTS IDENTIFICATION

Our request is to adjust our needs to a standard product from the PROVIDER portfolio.

If some of optional are included in standard configuration, please notice in the technical offer.
All optional agreed by AMG will be quoted separately in the commercial offer.

3.1.1 Operational Rate – Availability Rate

The assembly of the installation has to be conceived in order to achieve the above defined operational rate and availability rate, especially with the possibility to diagnose and replace immediately a faulty mechanism and the availability of necessary spare parts.

The definition by calculation of the Operational Rate and Availability Rate of the Equipment object of the work executed by the PROVIDER can be done in the following manner.

- The tolerated time for maintenance and breakdowns:
  - Tolerated Maintenance time planned stoppage: 30 h/year
  - Tolerated Break down unplanned stoppage per year: 72 h/ year
- The installation operates 365 days per year in 3 shifts x 8 h or 8760 h /year.
- Scheduled maintenance shutdowns are evaluated at: T planned shutdowns = 192 hours / year
- The Operational rate is calculated by integrating the stoppages planned for maintenance, or as:
  Operational rate = (8760 - $T_{planned\ stoppages}$ – $T_{tolerated\ breakdowns}$) / 8760
  Operational rate [%] = [(8760 - T planned shutdowns -T tolerated failures) / 8760] / 100 =
  = [(8760 - 192 - 48) / 8760] / 100 = [8520/8760] / 100 = 97.26%
- The Availability Rate is calculated excluding stoppages planned for maintenance, or as:
  Availability rate = (8760 - $T_{planned\ stoppages}$ – $T_{tolerated\ breakdowns}$) / (8760 – $T_{planned\ stoppages}$)
  Availability Rate = [(8760 – T planned shutdowns – T tolerated failures) / (8760 – T planned shutdowns)] / 100 = [(8760 – 192 – 48) / (8760 – 192)] / 100 = [8520 / 8568] / 100 = 99.44%

The Equipment object of the work executed by the PROVIDER has to achieve the following results and performances:

- Operating rate = 97.46 %
- Availability rate = 99.65 %

AVARIE	FOARTE FRECVENT 1 avarii pe luna Fmax = 12 / an	FRECVENT 4 avarii pe semestru Fmax = 8 / an	FRECVENTA REDUSA 4 avarii pe an Fmax = 4 / an	PUTIN PROBABIL 5 avarii odata la 5 ani Fmax = 1 / an
AVARIE BRUSCA Oprire > 16 h				
AVARIE CRITICA 4h < Oprire <= 16 h medie = 10 h				A
AVARIE MARE 2h < Oprire <= 4 h medie = 3h			A	A
AVARIE MINORA Oprire < 2 h Medie = 1 h		A	A	A

3.2 SPECIFIC RULES AND STANDARDS

Additionally, to enforced Norms and Regulations, as well as to construction standards, instructions and rules of the COMPANY, the PROVIDER will comply with the below mentioned specific rules and norms:

3.2.1 Standard:

- FEM 1.001 3rd Edition revision 1998/10/01
- Machining - ISO 2768/UNI EN 22768;
- CEN – European Committee for Standardization;
- CENELEC – European Committee for Electro technical Standardization;
- ETSI – European Telecommunication Standard Institute
- ANSI/AGMA n. 2001, 6001 and related standards for gearboxes
- ISO/AWS for welding design and procedures
- IEC for electrical part
- DIN for forged hooks
- DIN 15018;
- DIN 15020;
- EN 349 :1994 + A1:2008: Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
- EN-ISO 5817:2007: Welding - Fusion welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Guidance on quality levels for imperfections - > Level B = Quality level; Stringent
- EN 13135-1:2003 + A1:2010: Cranes - Equipment - Part 1: Electro technical equipment
- EN 13135-2:2004 + A1:2010: Cranes - Equipment - Part 2: Non-electro technical equipment
- EN 13155:2003 + A2:2009: Cranes - Safety - Non-fixed load lifting attachments
- EN-ISO 13857:2008: Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs
- EN 15011:2011: Cranes - Bridge and gantry cranes
- EN 1090 - 1+2: Execution of steel constructions & aluminium structures - Class to be determined during basic engineering.

3.2.2 Steel constructions:

- F.E.M. 1.001, edition 1998 - Booklet 1 to 9;
- Eurocode 0 (EN1990): basis of design
- Eurocode 1 (EN1991): actions
- Eurocode 3 (EN1993): steel
- EN ISO 13849-1 Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design- performance levels
- EN 13850 Safety of machinery — Emergency stop — Principles for design
- EN 62061 Functional safety of safety-related electrical, electronic and programmable electronic control systems - Safety Integrity Levels
- EN 954-1 Safety categories (replaced by EN ISO 13849-1 and EN 62061)
- EN 60204-1 Safety of Machinery Electrical Equipment of Machines Part 1: General requirements (replaced by EN ISO 13849-1 and EN62061)
- EN 60204-32 Safety of machinery - Electrical equipment of machines – Part 32: Requirements for hoisting machines (replaced by EN ISO 13849-1 and EN 62061)
- EN-ISO 14121-1 Safety of machinery - Risk Assessment Safety of machinery – Risk assessment examples of methods
- EN-ISO 14121-2 Safety of machinery - Risk assessment - Part 2: Practical guidance and examples of methods
- EN 14122-1 to 4 Access to work stations
- EN ISO 12100-1 Safety of machinery - Basic concepts, general principles for design Part 1: Basic terminology, methodology
- EN ISO 12100-2 Safety of machinery - Basic concepts, general principles for design Part 2: Technical principles
- EN ISO 13857 Safety distances, dimensioning and screening
- EN 953 Physical guards
- EN 563 Safety of Machinery - Temperatures of touchable surfaces
- EN ISO 13732-1 Ergonomics of the thermal environment - Methods for the assessment of human responses to contact with surfaces - Part 1: Hot surfaces
- IEC 61131 Programmable logic controllers (PLCs)
- EN 13135-1 Crane safety electromechanical equipment
- EN 13135-2 Crane safety non-electromechanical equipment
- EN 13557 Cranes. Controls and control stations
- EN 13586 Cranes. Access
- EN 12077-2 Cranes safety – Requirements - Part 2: Limiting and indicating devices
- EN 12644 Cranes - Information for use and testing – Part 1: Instructions Part 2: Marking
- EN 60034 Rotating electrical machines
- EN 60947 Low-voltage switchgear and control gear. General rules

3.2.3 Fire retardant or fire-resistant standards

- IEC 60332 Tests on electric and optical fiber cables under fire conditions

3.3 STUDIES

All definition and conception documentation, listed hereinafter in a functional and non-limited manner, as well as the basic and detail engineering are in the scope of the PROVIDER.

3.3.1 Mechanical Study

The PROVIDER is in charge of establishing all documents required for the management of the project, respectively:

- *Definition layouts*
- *General assembly layouts*
- *Calculation sheets*
- *Reliability study*
- *On site verification and validation of existing installation*
- *Access and protections*
- *Sub-assembly drawings*
- *Detail drawings*
- *Drawings in AUTOCAD.*

3.3.2 Functional studies

3.3.2.1 General and / or Detailed Functional Analysis

The COMPANY expresses its requirements in functional terms.

The PROVIDER:

- *Provides the operational instructions*
- *Elaborates the functional analysis jointly with the COMPANY*
- *Elaborates the form for the functional requirement;*
- *Verifies the correlation of this functional requirement with the requirements of the COMPANY*
- *Specifies the interfaces.*
- *Provides the maintenance manual*

3.3.3 Electrical and automation studies

3.3.3.1 General and detailed organic analysis

The PROVIDER has to:

- *Draw up the developed, single wire, implementation, cabling diagrams, list of parts, etc.*
- *Draw up the execution drawings*
- *Determine the organization and the constituents of the system*
- *Determine the commissioning of each constituent*

In order to structure the conception and the execution of sub-assemblies for automations, the PROVIDER has to use a library of standard programming modules, unless there is a properly justified exception. He has to supply the documentation and the applied standard programming modules.

The conception of automation sub-assemblies has to ensure the safety and the rapidity in installing, diagnosing and troubleshooting them.

3.3.3.2 Study for safety during conception

The PROVIDER has to:

- Identify the risks link to his supply during operation and maintenance phases
- Propose and integrate the corrective measures including lockout/tagout points
- List these risks and measures in a synthesis document

3.3.3.3 Studies for the execution and implementation of contracted work within existing installation

The PROVIDER has to:

- *Verify the existing installations (existing piping, anchorage, cabling ..)*

- *Study the interfaces with existing installations*
- *Make the studies for the integration of the system*
- *Make the execution drawings.*

3.3.3.4 *Special studies for erection during the execution of contracted work*

The PROVIDER has to optimize, within the contracted work, the operations to be performed on site in order to minimize the shutdown time for integration, as well as the number and duration of necessary initial stoppages. In this respect he will define:

- *Operational grid,*
- *Equipment's for erection and adjustments,*
- *Maintenance equipment's,*
- *Equipment's for the exploitation of the machine or installation.*

3.4 WCM

The PROVIDER will comply with IT DP 045 "General rules to be applied by LIBERTY contractors" and the «WCM Job List for Suppliers».

3.4.1 Synthesis of WCM measures and actions

The PROVIDER will provide a document under the form of a table, listing the actions and measures applied in order to comply with the WCM concept within the execution of contracted work.

3.5 FIRST PRIORITY PARTS – SPARE PARTS – UPGRADEABILITY

The PROVIDER will comply with IT DP 045 "General rules to be applied by LIBERTY contractors"

3.5.1 Availability of spare parts

Spare parts purchased by the COMPANY:

- At the end of the guarantee period, one year after reception
- Afterwards, within the time frame of the option negotiated to the main order

4. SPLITTING OF CONTRACTED WORK INTO FUNCTIONAL POSTS

In order to have clarity in the functional description of the contracted work, the COMPANY has hereinafter divided the contracted work into functional posts.

In the same idea, in order to clarify the global comprehension of the contracted work, the PROVIDER will comply with this splitting into posts, unless this splitting does not allow him to comply with his commitment for results.
The contracted work may split into posts.

- *Post 1: Design and documentation*
- *Post 2: Manufacturing*
- *Post 3: Transport and delivery on site*
- *Post 4: Erection and industrial commissioning*
- *Post 5: Training for operators and maintenance*

4.1 POST 1: DESIGN AND DOCUMENTATION

All the documents to be supplied will be in Romanian and English language (on paper and memory stick)

The documents issued in a foreign language have to be supplied in the "original language" version and the translation in Romanian language.

They will be updated and sent during the execution of the work, as per established planning.

The final versions of all documents, updated and accurate, will be submitted to the COMPANY prior to the Industrial Commissioning.

4.2 POST 2: Manufacturing

The PROVIDER must manufacture the overhead crane according to this technical specification, the engineering inputs, the design engineering, to Euro norms and must respect all the measurement tolerances agreed by the norms and by LIBERTY requests.

4.3 POST 3: TRANSPORT AND DELIVERY ON SITE

All transport is in the scope of the PROVIDER from where the device is made until where it will be erected.

The unloading at LIBERTY is also in the scope of the PROVIDER.
All damages during transport must be repaired by the PROVIDER.

The localization of the site of storing must be decided and agreed before signature of the contract.

4.4 POST 4: ERECTION AND INDUSTRIAL COMMISSIONING

Before any equipment leaves the manufacture, a pre commissioning must be made. LIBERTY might make a quality visit in order to authorize the delivery at LIBERTY site. The PROVIDER must inform and get the authorization of LIBERTY in order to deliver any equipment.

The PROVIDER must erect the device on its position and to organize and make all the cold and hot tests including production tests. All cranes, scaffoldings and man-power necessary for erection and industrial commissioning are in PROVIDER scope.

The PROVIDER must furnish the list with the details of each test that will be performed. This list must be validated by LIBERTY before to make any tests.

4.5 POST 5: TRAINING FOR OPERATORS AND MAINTENANCE

The training will be performed with training documents established by the PROVIDER, in Romanian and English language.
The PROVIDER will submit all the documents necessary for the exploitation and maintenance of supplied installation:

- Exploitation and maintenance instructions
- CE Conformity file

4.5.1.1 Contain of the training

The contain of the training must include enough information in order to make the proper maintenance to ensure the availability and reliability requested and in order to operate properly without damaging equipment's and to cumply with the performances requested.

Each training must validate the understanding with an exam to the attendees. If attendees don't pass the exam, another small training must be given again. The exams and the training contain must be approved by LIBERTY and must be enough difficult to ensure the minimum knowledge to ensure the operation and maintenance.

The training sessions will be organized thus to comply with the proper development of different phases of the project, by ensuring the necessary know-how to different intervention parties at the adequate moment.

The PROVIDER will provide for this training the necessary personnel having a perfect and very accurate knowledge about the Equipment.

4.5.1.2 Personnel to be trained by the PROVIDER

The PROVIDER must furnish 2 complete training for:

- The overhead crane maintenance teams of the department
- The operators of the department.

4.5.1.3 Location for the Training

- On-site, in the plant of the COMPANY

4.5.1.4 Training on the installation

- On the installation erected in the plant, on the site of the COMPANY

4.5.1.5 Time schedule of the training

The ensemble of this training will be organized thus to comply with the proper development of different phases of the project, by providing the necessary know-how to different intervention parties at the adequate moment.

The PROVIDER will specify in his offer the time schedule for the training period.

The PROVIDER will finalize the time schedule for the training period after performing the functional analysis.

The PROVIDER must send the contain of the exams and training and give 1 month to LIBERTY to comment on it and to propose modifications.

5. MANUFACTURING QUALITY CONTROL

The PROVIDER will comply strictly with IT DP 045 "General rules to be applied by LIBERTY contractors"

The PROVIDER engages to favour the shop test assembly and/or technical acceptance.
He will specify to the COMPANY which are the assemblies or sub-assemblies which can be erected in the workshop and / or technical acceptance and all the documents which can be defined.

The automation technical acceptance concerns the ensemble of functions, having as objective their validation. The PROVIDER favours all tests and technical acceptance of automation.

5.1 VISIT TO THE SUPPLIER

The PROVIDER will inform the COMPANY about the verifications and their planning, which will be conducted in the plant.

During the visit(s) for verification(s) in the plant, the PROVIDER will present to the controllers of the COMPANY, his Quality Insurance Manual as well as the Quality Insurance Plan, specific to the respective contracted work which he applied during the entire period for studies and manufacturing of concerned Equipment.

At any time, LIBERTY must be able and allowed to visit the shop to validate the progress of work and to audit the quality of execution.

5.2 APPROVALS

During the process of manufacturing and erection, LIBERTY might have approved some documents as having taking consideration of them but the responsibility of the success to achieve the performances and norms remains at the responsibility of the PROVIDER all the time.

5.3 QCP (QUALITY CONTROL PROCEDURE)

The PROVIDER must furnish the details of his quality control by describing which are points of control. LIBERTY will identify what point of control he wants to audit, and the PROVIDER must announce 3 weeks in advance LIBERTY and the production must stop to this point of control in order to perform the audit. For all manufacturing made upon the point of control requested by LIBERTY without its authorization, will have to be undo by the PROVIDER.

5.4 TECHNOLOGY OF ASSEMBLY

The PROVIDER must furnish enough details to demonstrate his technology of assembly in order to avoid any deficiencies on dimension under steel shrinking, torsion, etc.

5.5 NDT CONTROL ON WELDING AND MATERIAL REQUIREMENTS

All tests will be as per quality control requirements of the PROVIDER.
Please find below a table which should be filled and included in the technical offer.

6. RESULTS AND PERFORMANCES TO BE ACHIEVED AND MEASUREMENT OF RESULTS AND PERFORMANCES

6.1 RESULTS AND PERFORMANCES TO BE ACHIEVED

The PROVIDER studies, defines and executes the contracted work as well as the equipment object of the contracted work in order to achieve the results and performances defined below, as well as in IT DP 045 "General rules to be applied by LIBERTY contractors"

6.1.1 Exploitation

The work executed by the PROVIDER, as well as the Equipment object of contracted work, has to achieve the following results and performances in terms of exploitation:

Results and Performances expected in terms of exploitation that must be achieved and measured

- Availability rate = 99,655 %
- Travel speed for crane and trolley – conform LIBERTY request
- All maintenance point easily and safely accessible
- Stoppages for maintenance: 30 hours/year

6.1.2 Consumptions

The work executed by the PROVIDER, as well as the Equipment object of contracted work, has to achieve the following results and performances in terms of consumption:

- optimization of electrical consumption (Kwh)

6.1.3 Reliability – Maintenance - Availability

The work executed by the PROVIDER, as well as the Equipment object of contracted work, has to comply strictly with the recommendations regarding Maintenance and Reliability of installations, detailed in the document « List of WCM tasks submitted to the attention of suppliers» attached to this technical specification.
The work executed by the PROVIDER, as well as the Equipment object of contracted work, has to achieve also, the following results and performances in terms of Reliability – Maintenance – Availability

6.2 LIFETIME

The design must ensure a **lifetime of 25 years** if maintenance made according to the PROVIDER requirements.

6.2.1 Measurement of non-availability and availability rates

The Non-availability as well as the Availability rate of the Equipment object of contracted work will be verified and measured between the Industrial Commissioning phase and the Reception, and between the Reception and the end of the guarantee period.

7. SAFETY – ENVIRONMENT

THE COMPANY UNDERSTANDS THAT THE SAFETY OF EQUIPMENTS AND WORKS EXECUTED ON-SITE IS OPTIMUM AND WORKS ARE EXECUTED IN PERFECT SAFETY CONDITIONS.

The PROVIDER will comply strictly with IT DP 045 "General rules to be applied by LIBERTY contractors" and IT DP 044 General safety instructions for External Companies that work on the beneficiary's sites.

The PROVIDER will inform the COMPANY about all the specificities of the equipment in terms of environment and safety.

Taking into account the environment in which the Equipment will be installed, since the conception phase of the respective equipment, the PROVIDER will comply with the following prescriptions, regarding the safety of the equipment and that of the worksite.

8. TESTS - COMMISSIONING – RECEPTION

8.1 ON SITE TESTS

The PROVIDER prepares the testing procedures for the Equipment object of contracted work.

He ensures the availability of the organising and participating personnel, in terms of quality, number and necessary time, based on the time schedule defined by the general planning for tests:

- Partial tests
- Assembly tests
- Hot tests in the exploitation environment
- Adjustment tests
- Industrial Commissioning
- 72 hours test
- Performance tests

8.2 CONFORMITY OF THE EQUIPMENT, OBJECT OF CONTRACTED WORK

The PROVIDER will comply strictly with ITDP 045 "General rules to be applied by LIBERTY contractors".

8.3 COMMISSIONING

8.3.1 Partial Commissioning

A partial commissioning is requested to the PROVIDER shop. At the end of manufacturing before to start any delivery, LIBERTY must make a visit and to authorize the completion of work, the quality and the correspondence to the design before the delivery must start.

8.3.2 Industrial Commissioning

The PROVIDER will comply strictly with IT DP 045 "General rules to be applied by LIBERTYY contractors".

8.3.3 Stand-by and intervention

If the overhead crane is to ensure the operations, a permanent presence(s) will be maintained from the industrial commissioning until achieving the performances of the installation delivered by the PROVIDER, as per the specification.

8.4 RECEPTION

The PROVIDER will comply strictly with IT DP 045 "General rules to be applied by LIBERTY contractors"

The Reception will take place 3 months after the Industrial Commissioning, under the reservations that:

- The work executed by the PROVIDER, as well as the Equipment object of contracted work, achieve the results and performances defined in article 5 "Results and Performances to be achieved and measurement of results and performances"
- The PROVIDER has complied with all his contractual obligations.

9. GUARANTEE PERIOD

The guarantee period is 10 years

Those guarantees must ensure in the design and in the quality of components according to the maintenance plan furnished by the PROVIDER

10. DELAYS – PLANNINGS

The key dates for the development of the business are:

▪ Order:	Day D
▪ Submission of Project Quality Plan and Safety action plan on:	D + ... weeks
▪ Submission of main studies on:	D + ... weeks
▪ Launching of main procurement on:	D + ... weeks
▪ Starting the manufacturing in shop on:	D + ... weeks
▪ Shop tests assembly / Acceptance and simulation on:	D + ... weeks
▪ Start of erection on site on:	D + 6 months
▪ End of erection on site on:	D + ... weeks
▪ Start of tests on:	D + ... weeks
▪ Industrial Commissioning (IC)	D + 7 months
▪ Reception (PAC)	IC + 3 months
▪ End of guarantee period (FAC)	PAC + 24 months

The PROVIDER draws up and provides his Planning by specifying the main phases, including the preparation studies and works.

The PROVIDER also establishes the following different planning and ensures the compliance with:

- **General Time Schedule of the project**, allowing the time positioning of the following:
  - Studies.
  - The dates for the submission of documents
  - The reviews of conception
  - The procurement
  - The erection and shop test assembly
  - The civil works
  - The transportation
  - The training periods
  - The on-site erection
  - The tests and the industrial commissioning.

- **Detailed Time Schedule for the on-site erection** by specifying the main phases, including the preparation works. In particular, the PROVIDER specifies all the phases requiring the stoppage of the installation, therefore of the production.

11. PRESENTATION OF THE TECHNICAL AND COMMERCIAL OFFER

Inside AMG, the offers from suppliers must be split in 2 different ones, technical and commercial.

The technical must be communicated to the project manager of LIBERTY and the commercial one must be communicated only to our commercial responsible.

In his offer, the PROVIDER has to strictly comply with the splitting into posts as described in chapter 3.3.

11.1 TECHNICAL OFFER

11.1.1 Document to be supplied with Technical Offer

- List of reference work with similar size
- Shop certification
- Welder certification
- QCP (Quality Control Procedure) for the manufacturing
- Technical offer
- Crane data sheet identical to the one included inside this specification.
- List of quantity and description manufacturing equipment (ex: Full automated welding machine)
- Delays - Planning
- LIBERTY technical specification scan and signed on each page

11.2 COMMERCIAL OFFER

The commercial offer must be presented **ONLY** to the commercial department.

12. ANNEXES

- IT DP 045 "General rules to be applied by LIBERTY contractors"
- *IT DP 044 General safety instructions for External Companies that work on the beneficiary's sites*
- *IT DP 046 WCM Specification for supplier*