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Technical Specifications (In-Cash Procurement)

Technical Specification for LOTO and electrical commissioning activities support

Technical specification and statement of work for Lock-Out / Tag-Out (LOTO) Support and electrical commissioning activities for ITER Operations Division.

Contents

1. Purpose

This document is a technical specification and statement of work for Permit To Work (PTW) coordination support, Lock-Out / Tag-Out (LOTO) support and electrical commissioning activities for IO Operations Division. It defines the scope of the support and services to be provided, the requirements for those services and the process of defining deliverables. The document describes the technical and managerial scope linked to a Service Contract to be awarded to a Contractor selected through a competitive process.

2. Scope of work

The scope of work is a full-time service covering:

- the coordination of Permit To Work in areas/systems under Operations Division responsibility;
- the preparation, verification, installation, authorization and removal of the LOTO within areas/systems under Operations Division responsibility;
- assistance to electrical commissioning activities;
- assistance to commissioning activities for Electron Cyclotron Heating (ECH) systems.

This scope will cover areas/systems in commissioning or operation under IO Operations Division. LOTO will cover mechanical, electrical and Instrumentation and Control (I&C) domains.

The areas and systems under IO Operations Division are increasing in conjunction with the transfers from construction to commissioning /operation. At each transfer, the scope of responsibility of IO Operations Division is increased.

This technical specification aims to set up a service contract to support IO Operations Division in the PTW coordination, LOTO management and electrical commissioning activities. The IO (i.e. the IO System Responsible Officers, the IO Commissioning Responsible Officers and/or the IO Principal Shift Operators and IO PTW coordinator) will define the need for LOTO and PTW coordination. On the electrical commissioning side, the activity is organized by the Electrical Power Distribution Section (EPD) which is a section of IO Operations Division. For the ECH commissioning, the activities are organized by IO Commissioning Responsible Officer (ECH-SCRO) and IO Technical Responsible Officers. Based on those needs defined by the IO, the selected Contractor will be requested to provide the service accordingly.

Activities are expected to be performed on the ITER worksite.

3. Definitions and acronyms

A list of ITER abbreviations used throughout the ITER Project can be found at IDM:
https://user.iter.org/?uid=2MU6W5

4. Regulation/standard and References document.

4.1. Regulation and certification

- **Decree 2010-1017** obligation of the contracting authority

- **Decree 2010-1016** obligation of the employers
- **Decree 2010-1118** operation on (or in the vicinity) an electrical installation and the authorization
- **Decree 2010-1018** various provisions relating to the prevention of electrical hazard in workplace
- **Order of the 07/02/2012**: Safety for the INB
- **NF C18-510**
- **NF C15-100**
- **NF C13**-200
- **French Labour code (R4544-5)**
- **ED6127 - L'habilitation électrique** (INRS)
- **ED6109 - Consignations et déconsignations** (INRS)

4.2. References documents

The list of applicable document for OHS is available in the PGC Annex 0 (42FYPZ).

The main references documents are listed below; other missing references documents such as Working Instructions, templates and How to will be specified by IO during the execution of the contract.

- Provisions for Implementation of the Generic Safety Requirements by the External Interveners (ITER_D_SBSTBM).
- ITER internal regulation (https://user.iter.org/default.aspx?uid=27WDZW)
- PGC Annex 0 - List of the applicable annexes to the PGC SPS Volume 1 (https://user.iter.org/default.aspx?uid=42FYPZ)
- PGC Annex 1 - Specific measures for preventing the spread of Covid-19 on the worksite (https://user.iter.org/default.aspx?uid=36M2XY).
- ITER Site Development Plan (UYRHXW v1.1)
- Quality Assurance for ITER Safety Codes (ITER_D_258LKL)
- Procurement Requirements for Producing a Quality Plan (ITER_D_22MFMW)
- ITER Procurement Quality Requirements (ITER_D_22MFG4)
- ITER Organization Environmental Management System doc 1: PMAE v1 (ITER_D_97W4PN)
- Environmental requirements (ITER_D_97WRFP)
- Alert procedure on ITER construction site (ITER_D_7LB8NY). Information spread by PGC volume 1.
- Procurement Quality Requirements (ITER_D_22MFG4)
- Requirements for Producing a Quality Plan (ITER_D_22MFMW)
- ITER Site access Procedure (ITER_D_S3893D)
- PGC SPS Vol. 1 - IO&F4E (ITER_D_T6V4RP)
- Contractor Safety Management Procedure (Q2GBJF) (only valid for HQ, storage Area)
- Storage Areas Access Procedure (ITER_D_V9TVBS)
- Requirements for Producing a Contractors Release Note (ITER_D_22F52F)
- Procedure for the management of Deviation Request (ITER_D_2LZJHB)
- Procedure for management of Nonconformities (ITER_D_22F53X)

- Commissioning Management Procedure (ITER_D_VH9352)
- ITER Commissioning Plan (ITER_D_US7NT8)
- Template for Specific Health and Safety Plans (PPSPS) – bilingual version (ITER_D_K7C6SZ)
- ITER Site Permit to Work Overarching Procedure (3E8289) (mother procedure)
- How to - Permit to test in commissioning and operation (5GEK29) (daughter procedure)
- How to - Lock-out Tag-out in commissioning and operation (4YJZM2)

5. Contract Start and Duration

The service shall start 4 weeks after the entry the kick-off meeting. The total duration of the contract is 2 years with an optional extension for one (1) additional year.

6. Works description

6.1. PTW coordination support activity

This summary covers the technical services to provide to IO under the scope of the PTW coordination support activity.

1/ PTW office assistance

The contractor shall be able to bring assistance to the PTW office of IO Operations Division. The activity consists in the issue, distribution, archiving of the PTW. It implies from the contractor an extensive knowledge of the PTW/LOTO rules and a basic technical comprehension of the systems.

2/ Work coordination

The contractor shall be able to organize the coordination of the work in Areas and/or for systems under the responsibility of the IO Operations Division. It requires to manage the daily and weekly coordination meetings with the work supervisors intending to work in area(s) and/or on system(s) that are under the responsibility of IO Operations Division.

6.2. LOTO support activity

This summary covers the technical services to provide to IO under the scope of the LOTO support.

1/ LOTO preparation:

The contractor support team shall be able to define a LOTO upon the LOTO request and activity description provided by the IO (i.e. the IO System Responsible Officers, the IO Commissioning Responsible Officers and/or the IO Principal Shift Operators).

The contractor will rely on documentation provided by IO Operations Division to prepare the LOTO. Each LOTO must be detailed and documented.

2/ LOTO verification:

The contractor shall verify LOTO in Mechanical, Electrical (LV, MV) and I&C domains. The verification shall be conducted by a different contractor's personnel from the ones who prepare the LOTO as per "4-eyes" control principle.

3/ LOTO installation and confirmation:

The contractor shall install LOTO in Mechanical, Electrical (LV, MV) and I&C domains.

For LOTO installation, the contractor shall organize a team of at least two persons to install the LOTO on the field together and then confirm the LOTO within the electronic tool ("4-eyes" control principle applies).

4/ LOTO authorization:

When the LOTO is installed, the LOTO support team shall:

- update the master documentation for LOTO with the current configuration,
- notify and request the approval to the IO LOTO authorizer (Principal Shift Operator).

Once the LOTO is approved, the LOTO support team shall organize the keys and documents management (paper and electronic).

5/ LOTO removal:

Upon IO Operations Division demand, the LOTO support team shall:

- coordinate and organize the removal of the LOTO,
- update the master LOTO documentation and notify the PSO,

The final closure of the LOTO is validated by the PSO.

6.3. Electrical commissioning activity support

This summary covers the technical services to provide to IO under the scope of the electrical commissioning activity.

1/ Insulation resistance test

2/ Continuity test

3/ Energization of LV distribution boards

4/ Electrical parameters verifications (nominal voltage, phases rotation, etc…)

6.4. Assistance to ECH commissioning activities

This summary covers the technical services to provide to IO under the scope of the assistance to ECH commissioning activities.

1/ Support PBS 52 TRO with the elaboration of System Commissioning Plan, Commissioning Test Procedures (mainly tackling interfaces), Test Reports and Sub-System & System Commissioning Reports.

2/ To execute with CONST, design integration and interfacing PBS the needed temporary and permanent utility and service requirements.

3/ Implement supporting actions in order to properly organize the execution of ECH commissioning activities with support teams (e.g. OHS, work control administration, TOP preparation, logistics, and design integration).

4/ Support ECH-SCRO the preparation of a global punch-list items including all needed elements (e.g. CONST and interfaces), as well as on the closure of the punch items.

5/ Support PBS 52 TRO in supervising and execution of the commissioning tests of their respective system in compliance with the applicable procedures, ensuring to maintain records.

6/ Support PBS 52 TRO and ECH-SCRO with management of deviations and non-conformities.

7/ Might be required to perform above mentioned activities for other systems as well.

6.5. Responsibilities

6.5.1. Generalities

The Contractor warrants, represents and undertakes that:

1. The Contractor will provide the services promptly and with all due skill, care and diligence, in a good and workmanlike manner and otherwise in line with best practice within the Nuclear industry;
2. Contractor's personnel will possess the qualifications, professional competence and experience to carry out such services in accordance with best practice within the industry; Particularly, regarding electrical LOTO, the contractor's personnel shall be qualified HC/BC. The practical training is provided by the ITER Organization;
3. Contractor's support LOTO team will occur within areas under IO Operations Division responsibility. These areas evolve over the time. The contractor will be notified by IO Operations Division with anticipation at each take over of a new area;
4. Contractor's personnel will be bound by the rules and regulations governing IO safety and security and shall provide the required health and safety plans, such a PPSPS and a prevention plan following templates [RD2] and [RD12]. Certified training on "Nuclear Safety Order 1984" may optionally be required;
5. The Contractor will name one person at the Contractor premises or headquarters who will be the supervisor of the Contractor's execution team. The Contract supervising IO-RO must be able to contact the Contractor's supervisor person directly without passing through Contractor's personnel.

The ITER Organization shall make available to the dedicated Contractor's personnel located on IO site at Cadarache:

1. Relevant documentation, information, data and any specialized equipment necessary for the Contractor to perform its functions under this Scope of Work;
2. A safe work area that meets the generally accepted requirements for the satisfactory execution of the Services;
3. Access to the premises and to the dedicated work areas;
4. Electrical practical training;
5. Training and access to the electronic LOTO tool;
6. Any necessary and appropriate worksite related safety training.

6.5.2. PTW coordination support

The responsibilities between the Parties for the PTW coordination support is summarized in Table 1 and is further detailed in the following sections.

Activity	IO	Contractor
A- PTW office assistance	R	S
B- Work coordination	A	R

Table 1 Summary of the Responsibilities between the IO and the Contractor (Electrical)

R = Responsible for organizing, performing and for the content

A = Review/Comment/Accept/Approve

S = Support

6.5.3. LOTO support

The responsibilities between the Parties for the LOTO support activity is summarized in Table 2 and is further detailed in the following sections.

Activity	IO	Contractor
A- LOTO Demand	R	A
B- LOTO Preparation		
LOTO design following applicable rules	A	R
documentation attached to the LOTO	A	R
C- LOTO Verification		R
D- LOTO Installation		
Facility configuration (stop process)	R	A
LOTO material procurement	R	A
LOTO material preparation		R
LOTO key management	A	R
E- LOTO Authorization		
LOTO key and document management	A	R
LOTO approval	R	A
D- LOTO removal		
Removal demand	R	
LOTO removal + archiving of the documentation	A	R
LOTO final closure	R	A

Table 2 Summary of the Responsibilities between the IO and the Contractor (LOTO)

R = Responsible for organizing, performing and for the content

A = Review/Comment/Accept/Approve

6.5.4. Electrical commissioning activity support

The responsibilities between the Parties for the Electrical Commissioning support is summarized in Table 3 and is further detailed in the following sections.

Activity	IO	Contractor
A- Insulation resistance test	A	R
B- Continuity test	A	R
C- Energization of LV distribution boards		
LOTO material procurement	R	A
Electrical parameters verifications and energizations	A	R

Table 3 Summary of the Responsibilities between the IO and the Contractor (Electrical)

R = Responsible for organizing, performing and for the content

A = Review/Comment/Accept/Approve

6.5.5. Assistance to ECH commissioning activities

The responsibilities between the Parties for the Assistance to ECH commissioning activities are summarized in Table 4 and is further detailed in the following sections.

Activity	IO	Contractor
A - Elaboration of System Commissioning Plans, Commissioning Test Procedures, Test Reports and Sub-System & System Commissioning Reports.	R	S
B - Execution/implementation of temporary/permanent utilities and services for ECH Commissioning	A	R
C - Organizing the execution of ECH commissioning activities with support teams	A	R
D - Support ECH-SCRO the global punch-list management	A	S
E - Support PBS 52 TRO in supervising and execution of the commissioning tests, ensuring to maintain records.	R	S
F - Support PBS 52 TRO and ECH-SCRO with management of deviations and non-conformities.	A	S

Table 4 Summary of the Responsibilities between the IO and the Contractor (ECH commissioning)

R = Responsible for organizing, performing and for the content

A = Review/Comment/Accept/Approve

S = Support

6.6. Documentation

ITER Organization provides the necessary documentation (Design documents, LOTO procedure, Commissioning Test Procedures, etc.). The Contractor shall notify IO in case of missing documentation or found discrepancies.

6.7. Location

Due to the nature of the works to be performed, the team must be permanently located on ITER site and the defined office spaces.

6.8. Contractor's execution team

In order to ensure the full performance of the Contract scopes, the Contractor shall set up, and mobilize and operate their execution team on full time basis at the ITER premises.

The Contractor shall appoint a leader ("LOTO responsible officer" below, or also called "supervisor" in Section 6.3.1.5 above) who shall lead, manage and supervise their team. The IO shall not supervise the Contractor's team members.

To fulfil the required scope, it is expected that the Contractor shall form their execution team with the following profiles:

- one (1) PTW Technician for assistance to the PTW office. This person shall have a technical background to understand the work activities proposed by the work supervisors. This person shall also coordinate the co-activity in the areas under the IO Operations Division.
- two (2) LOTO Technicians able to conduct electrical commissioning activities, at least one of these two people shall be able to perform electrical commissioning activities;
- one (1) LOTO Responsible Officer being the Contractor's Site Responsible and entry point for IO; This person shall also be able to conduct electrical commissioning activities.
- one (1) Commissioning Support Officer responsible for assistance to ECH commissioning activities. This person shall also be able to conduct electrical commissioning activities.

The full mobilization of the entire execution team on ITER site shall take place before the deadline to be agreed by both Parties at the kick off meeting but in any case it shall not be later than 2 months after the Contract signature. The Leader (LOTO Responsible Officer) must start providing service on full time basis on ITER site immediately upon the signature of the Task Order(s).

The Contractor's team is expected to have adequate experience in LOTO management (electrical, mechanical and I&C) and in Electrical Commissioning in large industrial installation:

- PTW Technician shall have a minimum of a relevant Technical Degree and experience (Electrical-Mechanical-I&C Commissioning);
- LOTO Technicians shall have a minimum of a relevant Technical Degree and experience (Electrical-Mechanical-I&C Commissioning);

- LOTO Responsible Officers are expected to have a relevant engineering degree (mechanical, electrical or similar) and at least 5 to 10 years of relevant experience including a LOTO manager background;
- Commissioning Support Officer is expected to have an electrical/nuclear/industrial engineering degree and shall have at least 10 years of relevant electrical/nuclear commissioning experience, as well as experience in working with LV/MV/HV systems.
- Electrical Commissioning technicians shall have a minimum of a relevant Technical Degree and experience in Electrical-domain;

The required competencies for above mentioned team include:

1. Electrical certificates needed to work in LV/HV electrical installation;
2. Electrical certificate as isolation (consignation) authority (HC/BC);
3. Working at heights authorization;
4. Experience with Mechanical-Electrical-I&C in industrial plant;
5. Experience with using continuity and resistance testing devices and multimeters;
6. Knowledge and Experience of Valves, Pumps & Heat Exchangers;
7. Experience with understanding of PID, single line diagram and I&C diagram;
8. Experience with using MS Office to produce documentation ;

The Contractor's onsite team shall have a perfect knowledge of the French Electrical regulation (labour code) and of the related Standards (in particular NF C18-510), due to the nature of the scope, each member of the Contractor's team shall possess a valid French electrical certification (Habilitation Electrique) HC/BC, as well as HE/BE (manoeuvre and measurement).

Trainings on process systems and specific software such as SAP and E-vision will be provided by IO.

The Contractor personnel shall be experienced in using Microsoft Office tools.

7. Implementation of the Contract

7.1. Monthly meeting

The Contractor shall organize monthly meetings related to the ongoing contract, with the IO Responsible Officer (RO) and concerned other IO staff such as the dedicated task's IO Technical Responsible Officer (TRO), in order to examine progress of recent and ongoing activities, to review short-term schedules and to review new, eventual changes or necessary amendments in the existing Contract, schedule of activities and list of deliverables.
The minutes of these meetings shall be written by the Contractor in the simplified form using the IO provided template, with action items and submit the minutes for the approval of the IO Contract Manager in ITER Document Management (IDM) system.
The Contractor written progress reports to the IO Responsible Officer is a deliverable every month. The monthly report shall be submitted in IDM and it shall include at least the following information for the reporting period:

1. Safety Performance Indicator
2. Summary of the work carried out for the ongoing Contract;
3. Description of any problems encountered for the ongoing Contract;
4. LOTO's, Electrical Commissioning's and ECH commissioning's support KPIs;

5. Staffing plan issues if any according to IO Schedule of activities;
6. Performance of the Contractor (see section 9)

During this Monthly meeting, IO will provide the Contractor with a schedule of activities & list of deliverables for the following month. The schedule of activities & list of deliverables will also be provided by IO for the following 3 to 6 months in Task Orders.
The progress report shall be submitted by the Contractor three working days before the monthly meeting. The progress report shall be approved by the ITER Organization RO.

7.2. Ad hoc Meetings

To be scheduled at the discretion of the IO-RO or the Contractor depending on the need. The minutes of these meetings shall be written by the Contractor in a simplified form of a table of action items and archived in IDM.

8. Deliverables

The deliverables within this Contract consist of the Monthly Progress report as defined in section 7.1.
An approved deliverable is a report or document delivered in the ITER document management system (IDM), submitted or reviewed by the CRO and approved by a TRO of the task or the RO of the contract.

9. Performance

Performance will be reviewed during the monthly meeting, the Contractor is expected to prepare its monthly performance report according to the criteria defined below:

- Number of Accidents and Near-Misses
- PTW assistance activity KPIs:
  - Daily and weekly coordination mappings deliver on-time
  - Number of PTW delivered monthly
  - Number of PTW closed monthly
  - Number of PTW rejected monthly
  - Mean time to instruct PTW monthly
- LOTO's KPIs:
  - Number of LOTO installed monthly
  - Number of LOTO removed
  - Number of LIVE LOTO to date
  - Number of LOTO rejected by IO authorizer
  - Average time duration to install a LOTO
- Electrical Commissioning KPI
  - On time activities
- Assistance to ECH commissioning activities:
  - On time activities

Additional performance indicators might be requested during the contract's lifetime.

10. General conditions and requirements

10.1. Applicable codes and standards

The Contractor shall comply in performing the contract, with applicable laws, decrees, circulars and standards. The Contractor shall be responsible for all requests for administrative authorisations and declarations that are required by virtue of applicable regulations.

10.2. Language

Since the official language of the ITER Organization is English, all written communication and deliverables shall be in English.

10.3. Site Data

10.3.1. Necessary information

The Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Works. To the same extent, the Contractor shall be deemed to have inspected and examined the site, its surroundings, the above data and other available information, and to have been satisfied as to all relevant matters.

10.3.2. Roads and Traffic management

It is the responsibility of the Contractor to put in place all the necessary safety and traffic management measures, in accordance with applicable rules and regulations, to ensure that staff and vehicles retain safe passage across the ITER Site. All the required equipment etc. to create a safe environment for the Works and ITER staff shall be provided by the Contractor.

During the Works, any road shall not be blocked for more than half its width. For total closure of any roads, Works shall be performed on Saturdays only.

Roads accessing the worksite must be kept clean at all times. For this purpose, the Contractor shall organize road washing as often as earth is observed.

Vehicles or machinery, particularly those used for earthworks and civil engineering works, must be manoeuvred safely. Any damage to surrounding structures (buildings, roads, sidewalks, walkways) must be immediately repaired by the Contractor.

10.3.3. Safety

The Contractor will have to comply with the relevant IO OSH site instructions. The list is available in the PGC Annex 0 (42FYPZ). If the Contractor does not have access to ITER Document Management system, the document can be sent on demand.

Works can be performed on the ITER worksite or at the HQ/storage area. This could lead to additional OHS documentation (PPSPS-PDP) and meetings.

Depending of the location of the works, a safety plan (PPSPS) or Prevention Plan (PDP) shall be established by the Contractor (at a minimum in French) prior to the start of the Works. Contractor will have to use the ITER template. The Contractor and the potential subcontractor will have to attend to the common inspection with the relevant stakeholder.

10.3.4. Environmental protection

The Contractor shall comply with environmental protection requirements and procedures applicable at the ITER Site:

- ITER Organization Environmental Management System doc 1: PMAE v1 (ITER_D_97W4PN);
- Environmental requirements, (ITER_D_97WRFP [).

An environmental respect plan shall be provided by the Contractor 2 weeks prior to the start of the Works, using the ITER template.

Debris and waste of all type shall be removed as work progresses.

The Contractor shall be responsible for cleaning, repairing and restoring facilities which it dirtied or damaged to their original condition, and shall remove their debris and rubbish to public rubbish tips.

Should said cleaning fail to be performed, it will be done by a third party at the loss and expense of the Contractor.

10.3.5. Access to the site / Worksite installation

Access to the ITER Site is subject to the ITER Site Access Procedures

The Contractor shall be responsible for supplying and installing fencing protecting the worksite which shall be maintained for the duration of the works and removed after completion of the Works. The Contractor shall also display signs prohibiting entry onto the worksite.

10.3.6. Work authorisation

For the LOTO support activity, as it implies a strict collaboration with the PTW office and a deep knowledge of the equipment, no Work Authorization are necessary for this activity.

For the Electrical commissioning activities, prior to the start of any Works on the ITER Site, a Work Authorisation must be obtained in accordance with the Work Authorisation Procedure. Permit to work will be requested by the Contractor and managed by IO.

10.4. Quality Assurance (QA) requirements

The organisation conducting these activities should have an ITER approved QA Program or an ISO 9001 accredited quality system.

The general requirements are detailed in ITER Procurement Quality Requirements.

Prior to commencement of the Works, a Quality Plan must be submitted for ITER Organization approval giving evidence of the above and describing the organisation for this task; the skill of workers involved in the study; any anticipated sub-contractors; and giving details of who will be the independent checker of the activities (see Procurement Requirements for Producing a Quality Plan).

Documentation developed as the result of this task shall be retained by the Contractor for a minimum of five (5) years and then may be discarded at the direction of the ITER Organization.

Prior to acceptance, delivery or payment, the Contractor shall perform a review of items and services status with respect to contract requirements shall be made and documented. This review shall be done in accordance with and documented in the Contractor's Release Note – refer to.

The Contractor shall obtain written agreement from the ITER Organization to any modifications to the design or this specification. Deviations and non-conformances shall be processed in accordance with the procedure. The Contractor shall commit to process non-conformance reports or Operations change requests and associated remedial and corrective actions expeditiously.

10.5. Safety Requirements

ITER is a Nuclear Facility identified in France by the number-INB-174 ("Installation Nucléaire de Base"). For Protection Important Components and in particular Safety Important

Class components (SIC), the French Nuclear Regulation must be observed, in application of the Article 14 of the ITER Agreement.

In such case the External Contractors (Suppliers and Subcontractors, and their Subcontractors) must be informed that:

- The Order 7th February 2012 applies to all the components important for the protection (PIC) and the activities important for the protection (PIA).
- The compliance with the INB-order must be demonstrated in the chain of external contractors.
- In application of article II.2.5.4 of the Order 7th February 2012, contracted activities for supervision purposes are also subject to a supervision done by the Nuclear Operator.