

## Technical Specifications (In-Cash Procurement)

# Technical summary for the Management & Maintenance of the IO's Temporary Low Voltage Electrical Network

The technical summary is the precursor to the technical specification. The Technical summary will be used as part of the expressions of interest process.

The contract shall be for the management of the IO's temporary Low Voltage electrical network, the modification and adaptation of the temporary electrical network and for providing interventions for fault finding, repairing and maintaining the temporary electrical network fully operational during 24 hours of each day, together with providing ...

**Management and Maintenance of the ITER  
Organization's Temporary Electrical Network at the  
ITER site  
Technical summary**

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## 1 Introduction

The ITER project aims to build a fusion device, fivefold the size of the largest current devices, with the goal of demonstrating the scientific and technical feasibility of fusion power. It is a joint project between the European Union (represented by EURATOM), Japan, the People's Republic of China, India, the Republic of Korea, the Russian Federation and the USA. ITER is being constructed in Europe, at St Paul Lez Durance in the south of France.

## 2 Contract outline

As the construction entity of the buildings, Fusion for Energy (F4E), has finished its works, the ITER Organization (IO) has taken over the temporary electrical network around the construction site.

This system is in place to facilitate the construction works until such time as the permanent electrical network is available or the construction works are completed.

The IO makes the LV temporary network available to numerous contractors and sub-contractors to avoid the mobilisation / demobilisation of the temporary electrical network on each occasion one contractor commences and another finishes.

The contract shall be for the management of the temporary Low Voltage electrical network, the temporary lighting network, the modification and adaptation of the temporary electrical and lighting network and for providing interventions for fault finding, repairing and maintaining the temporary electrical and lighting network fully operational during 24 hours of each day, together with providing electrical advise and support to the ITER clients that are installed or working in the building covered by the Temporary networks, which includes the Tokamak Pit area.

Interventions will be during normal (standard situation) and outside (specific situation on request) normal working hours through either shift work or on-call service.

Interventions during normal working hours will be managed using the JIRA project management tool.

Interventions outside of working hours (19:00-07:00, weekends and bank holidays) will be either by telephone or e-mail and subsequently confirmed via the jira project management tool.

The contract will also include for the provision of technical support to the entities that are working within the areas covered by the Low Voltage temporary electrical & lighting network with regards to the connection to earth and the provisions for equipotential and supplementary equipotential electrical bonding of temporary structures and components that are in use.

The temporary networks are currently served via six 15kV/400V temporary transformers: TLC01, TLC02, TLC03, TLC 04, TLC05 and TLC74. The network may be expanded depending on the demand from its users and the anticipated requirements.

Figure 1 below details the approximate locations of the temporary transformers: in purple. The contractor will be responsible for the management of waste that is produced during the execution of the contract or is a product of the contract.

## Steady State Electrical Network + LV Temporary electrical network

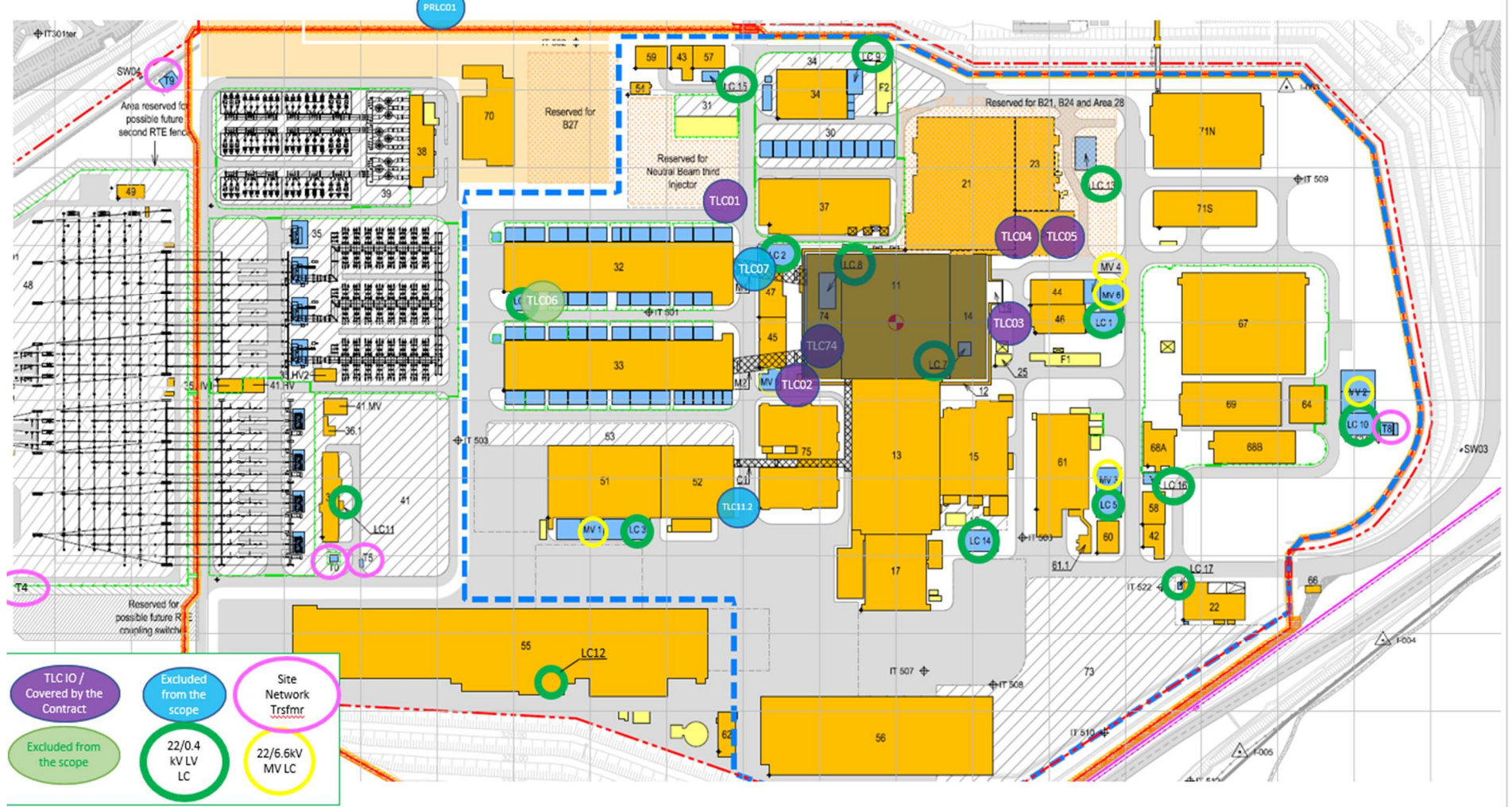


Figure 1 ITER site wide Transformer locations



The principal component parts of the temporary electrical network are summarised below:  
The interested parties should note the following:

- 6 of Temporary Load Centres 15kV – 400V.
- 11 of TGBT (3200A, 2000A, 400A.)
- 118 of ECAB (800A – 40A.)
- 258 of Socket boxes (250A -40A.)
- 33 lighting panels part of ECAB.

These serve approximately:

- 750 number fluorescent twin luminaires (Mixed 2 x 49W and 2 x 58W.)
- 550 number emergency fittings
- 75 number floodlights
- 30 number lamp posts with flood lights
- 25 number LV LED rope lights.

### 3 Contract Scope

- The initial contract will be for three years with two options to extend the contract by a further one year. (Giving a maximum total of five years for the duration of the contract.)
- The appointed contractor shall:
  - respond within fixed times to a request for intervention from the IO, an IO contractor, Fusion for Energy's (F4E's) Architect Engineer (AE) or the IO's Construction Management as Agent (CMA). The fixed time could be from an hour for an out of hours call out to 24 hours for a day to day intervention, to a week for a quotation and two weeks to complete depending on the scale of the intervention or work.
  - maintain the service availability during each working day (07:00-19:00) with the presence of on-site qualified/certified electricians, management team together with a health and safety team. The contract will include, as an option, to offer a standard (Monday to Friday) working day from 07:00 to 22:00hours.
  - provide quotation and design office facilities either on site or off site or via a mixture of both.
  - provide a schedule of rates that will be used to price any request for quotations. The schedule of rates will be contractually binding.

- provide fixed price quotations with the tender for specified activities that could be instructed throughout the contract period. These prices shall be contractually binding and shall facilitate the expedition of the contract. The list may include:
  - Replacement of a circuit breaker in a distribution board, socket box or similar,
  - Replacement of a residual current device in a socket box, distribution board or similar,
  - Supply & Installation of a specified socket box with a maximum length of cable,
  - Supply & Installation of a specified string of lighting luminaires to provide general lighting with a maximum number of luminaires and length of cable,
  - On call intervention out of working hours.
- Supply & installation of temporary services. [All figures shall include all materials, labour and indirect costs. (No works will be instructed or invoiced on a labour and materials basis.)]
- provide outside working hours on call standby operatives (intervention delay  $\leq 1$ h). To be used in case of any event out of working hours.
- analyse and resolve any problem due to an electrical disturbance.
- repair or replace electrical equipment & components when not operational or damaged or dysfunctional.
- re-site, reposition the temporary electrical components and equipment to facilitate the construction's works.
- undertake Lock Out Tag as required in line with [ITER Lock-Out Tag-Out Instruction \(34Q3GJ v4.2\)](#) and Consignations et Déconsignations (Lockout Tagout): INRS ED6109.
- define and perform the preventive maintenance programme for the temporary networks. (Lighting and Power)
- handle and manage IO property and its associated storage.
- management and disposal of the waste produced or as a product of the contract.
- management and valuation of valuable waste.
- provide a weekly report of the interventions. Listing the
  - subject of the intervention/problem description
  - name of the requesting entity (organisation)
  - duration of the resolution
  - Advice on loading of the network to prevent overloading of the system
- provide monthly written reports on the condition, the maintenance, the modification and troubleshooting performed on the temporary electrical network.

- Maintain and share with the IO an asset register detailing all material characteristics, locations, condition and service records.
- carry out regulatory periodic inspections and regulatory initial inspections as required for new systems or adapted systems in accordance with the French labour code:
  - Arrêté du 26 décembre 2011 relatif aux vérifications ou processus de vérification des installations électriques ainsi qu'au contenu des rapports correspondants.
  - Chapitre VI : Installations électriques (Articles R4226-1 à R4226-21.)
  - Section 5 : Vérification des installations électriques (Articles R4226-14 à R4226-21.)
  - Sous-section 1 : Vérification des installations électriques permanentes (Articles R4226-14 à R4226-20.)
  - Sous-section 2 : Vérification des installations électriques temporaires (Article R4226-21) Article R4226-21.
- perform calculations to NF C15-100 and NF C13-200 to support the selection of new or modified networks.
- perform calculations to demonstrate the adequacy of the existing or adapted or new networks.
- provide support in the form of professional advice for electrical matters to clients connected to temporary networks.
- install temporary lighting and emergency lighting where the permanent is unavailable and as directed to ensure all areas of the construction site have adequate lighting for the tasks to be completed safely as noted in the French labour code R.4223-1 to R4223-12 and the European norm NF EN 12464 and summarised in the table below:

<b>Area/Room</b>	<b>Illumination Level</b>	<b>Emergency lighting level whilst under construction</b>	<b>Emergency lighting level under normal usage</b>
Offices and meeting rooms	500 lux	50 lux (15 lux minimum)	1 lux
Control rooms	500 lux	50 lux (15 lux minimum)	50 lux (15 lux minimum)
Tunnels and galleries	150 lux	15 lux (15 lux minimum)	15 lux (15 lux minimum)
Technical and switchgear rooms	320 lux	32 lux (15 lux minimum)	32 lux (15 lux minimum)
Workshop (maintenance area)	450 lux	45 lux (15 lux minimum)	45 lux (15 lux minimum)
Laboratories	500 lux	50 lux (15 lux minimum)	50 lux (15 lux minimum)

Sanitary facilities (bathrooms, toilets)	200 lux	20 lux (15 lux minimum)	1 lux
Corridors	200 lux	20 lux (15 lux minimum)	1 lux
Large halls (h> 6 m)	200 lux	20 lux (15 lux minimum)	1 lux
Battery rooms	300 lux	30 lux (15 lux minimum)	30 lux (15 lux minimum)
Pedestrian paths	40 lux	15 lux (15 lux minimum)	1 lux
Staircases	60 lux	15 lux (15 lux minimum)	1 lux
External areas movement of people, machines and vehicles.	50 lux average (20 minimum.)	15 lux (15 lux minimum)	15 lux (15 lux minimum)

*Table 1 Lighting levels for the ITER site*

- manager the temporary lighting in all the levels of the buildings 11, 14 & 74. This extends to the roof area, the external paths and the buildings 32/33 & 52 busbar and Cryo bridges and the Tokamak pit.
- Manage the provision of temporary emergency lighting, that for construction site purposes shall be 10% of the nominal, at the working plane, with a minimum value of 15lux, whichever is the higher.
- maintain for the duration of the contract a calculation tool to adequately dimension electrical cables and components in accordance with NF C15-100 and NF C13-200.
- have access to the latest version of the French standards NF C 15-100 and NF C 13-200 and NF C18-510 for the duration of the contract.
- The contractor shall ensure constant compliance of the scope of the contract with the latest version of the above standards.

An example of the detailed that is required to be included within the inventory is detailed in figure 3 below:

TaggingID/Serial Number	Description	Location	Additional Location information	Category	Qty	Addit	Supplied from	LV Power source	COMMENTS	Annual Inspection BV 05/2024	Verification 22/08/2025	Verification 02/10/2025
208-ID-SOCK-1-D8-2	Socket boxes	CENTRAL PIT	CENTRAL PIT	SOCK	1	40A	209-ID-SOCK-1-D8-3			Done	ok	OK
209-ID-SOCK-1-D8-3	Socket boxes	CENTRAL PIT	CENTRAL PIT	SOCK	1	40A	379-ID-ECAB-2-B2	TLC03		Done	ok	OK
219-ID-SOCK-1-A6-1	Socket boxes	B11-B2	South	SOCK	1	40A	443-ID-ECAB-1-B11-B2	TLC02		Not found	ok	OK
220-ID-ECAB-1-A8	LV cabinet	TGBT WEST (TLC02)	B74 WEST EXT(next to TLC02)	ECAB	1	100A	1270-ID-TGBT-O-A	TLC02	Départ 4	Done	ok	OK / apparait 2 fois dans rapport
221-ID-SOCK-1-A8-1	Socket box	GALLERY	NORTH B61 Zone 1A	SOCK	1	40A	72-ID-ECAB-1-A2	LC05		Done	ok mais faute de frappe	OK toujours faute de frappe / apparait 2 fois dans le rapport
222-ID-SOCK-1-A8-2	Socket box	GALLERY	Gallery B74 Zone 2B	SOCK	1	40A	1759-ID-ECAB-N6	TLC01		Done	ok mais faute de frappe	Ok mais toujours faute de frappe / apparait 2 fois dans rapport
223-ID-SOCK--A8-3	Socket box	GALLERY	Gallery B74 Zone 2B	SOCK	1	40A	1759-ID-ECAB-N6	TLC01		Done	rien	OK
224-ID-SOCK-1-F2-1	Socket Boxes	B56	sur prise	SOCK	1	40A	sur coffret prise B56	FINAL NETWORK B56		Done	rien	n'apparait pas dans le rapport
225-ID-SOCK-1-F2-2	Socket Boxes	CA3 STORAGE		SOCK	1	40A				Done	ok	OK mais m'apparait pas dans la première partie du rapport \$ installations basse et très basse tension
226-ID-SOCK-1-F2-3	Socket Boxes	B37	interieur	SOCK	1	40A	230-ID-ECAB-1-F2	TLC05		Done	ok	OK mais m'apparait pas dans la première partie du rapport \$ installations basse et très basse tension
227-ID-SOCK-1-F3-1	Socket Boxes	B37	interieur	SOCK	1	40A	230-ID-ECAB-1-F2	TLC05		Done	ok	OK mais m'apparait pas dans la première partie du rapport \$ installations basse et très basse tension
228-ID-SOCK-1-F3-2	Socket Boxes	B56	sur prise	SOCK	1	40A	sur coffret prise B56	FINAL NETWORK B56		Not found	Pas acces	OK mais m'apparait pas dans la première partie du rapport \$ installations basse et très basse tension + apparait 2 fois dans \$ Resultats des mesures et essais
229-ID-SOCK-1-F3-2	Socket Boxes	CA3 STORAGE		SOCK	1	40A				Done	ok	OK mais m'apparait pas dans la première partie du rapport \$ installations basse et très basse tension + apparait 2 fois dans \$ Resultats des mesures et essais
230-ID-ECAB-1-F2	LV Cabinet	B37	Exterieur South	ECAB	1	100A	1196-ID-ECAB-H1	TLC05		Done	ok	OK mais m'apparait pas dans la première partie du rapport \$ installations basse et très basse tension
231-ID-ECAB-1-F3	LVCabinet	CA3 STORAGE	CA3	ECAB	1	100A				Done	ok	Ok en CA3
232-ID-SOCK-1	Socket Boxes	B74-L4	L4	SOCK	1	40A	1248-ID-SOCK-L2-2	TLC02	Connecté sur Prise via le	Done	ok	OK
233-ID-ECAB-1-8	General electrical cabinet	B14-L1	EXT B14	TGBT	1	400A	1827-ID-TGBT-TLC03-A	TLC03		Done	ok	OK
234-ID-ECAB-1-67	HRS Motor test panel	CA3 STORAGE	CA3	ECAB	1	400A		NOT IN USE	CGS-671	Done	rien	n'apparait pas dans le rapport
376-ID-ECAB-1-B2	LV Cabinet	B11-B2	WEST	ECAB	1	250A	442-ID-ECAB-1-B11-B2	TLC02		Not found	ok	OK
377-ID-SOCK-1-B2-1	Socket box	B11-B2	WEST	SOCK	1	63A	376-ID-ECAB-1-B2	TLC02		Not found	ok	OK
378-ID-SOCK-1-B2-2	Socket box	CENTRAL PIT		SOCK	1	63A	59-ID-ECAB-1-A1	TLC03		Done	&	Indiqué comme non vérifiable + parc CA3
379-ID-ECAB-2-B2	LV cabinet	B11-B1	EAST	ECAB	1	250A	1191-ID-TGBT-PETILLOT-1	TLC03		Done	ok	OK
380-ID-SOCK-2-B2-1	Socket box	CENTRAL PIT	B1	SOCK	1	63A	424-ID-ECAB-2-B11-B1	TLC03		Done	ok	OK
381-ID-SOCK-2-B2-2	Socket box	B11-B1	PC08	SOCK	1	63A	420-ID-ECAB-1-B11-B1	TLC02		Done	ok	OK
382-ID-ECAB-1-B22	General electrical cabinet	B22		ECAB	1	250A	T3	T3		Done	ok	OK
383-ID-ECAB-1-A39	General electrical cabinet	A39		ECAB	1	250A	PRLC1	PRLC1		To do	ok	OK
384-ID-ECAB-1-A39-1	LV cabinet	CA3 STORAGE	CA3	ECAB	1	125A		NOT IN USE		Done	ok	Ok en CA3
386-ID-ECAB-1-8-1	LV cabinet	B67	EAST	ECAB	1	160A	233-ID-ECAB-1-8	LC10	B67 OH CRANE PANEL	Done	ok	OK
404-ID-ECAB-1-B11-B2	LV cabinet	B11-B2	WEST	ECAB	1	100A	1189-ID-ECAB-B11-1	TLC02		Done	ok	OK

Figure 3 Extract from the LV temporary electrical inventory

Example of the layout for socket boxes and their upstream electrical cabinets from level 3 of the Tokamak complex (Buildings 11,14 & 74.)

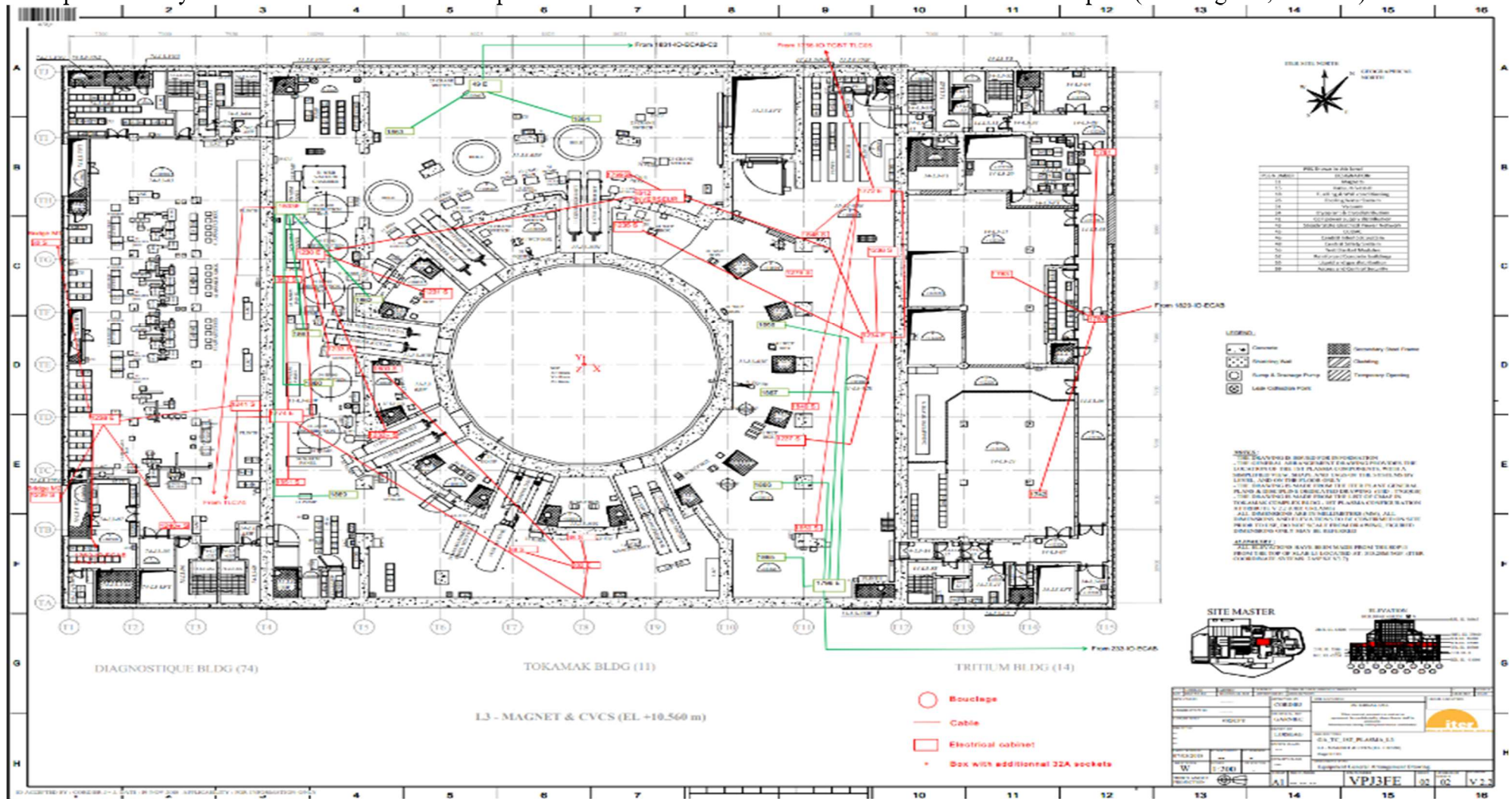


Figure 4 Example of the layout for socket boxes and their upstream electrical cabinets

Examples of a main distribution panel an electrical cabinet and 400-volt socket box installed on site



Figure 5 Examples of the electrical components associated with the Temporary electrical network

## 4 Candidate's Experience and Technical Capability

Besides the candidates Financial and Economic capacity, the Pre-selection will be based on the following:

- During the preceding 5 years, the Candidate shall have carried out electrical maintenance contracts to at least two projects which involved construction, installation, operation and maintenance.

(The experience shall be attributed to the Organisation that is applying. Where a company claims to have the required experience, it shall be in its current entity.)

The candidate shall employ staff who are accredited with the appropriate Habilitation électrique as detailed under the NFC 18 510.

The candidate shall submit anonymous CV for the proposed management team and examples for the electrical operatives that could be employed.

The candidate shall demonstrate experience of using a Computerised Maintenance Management System.

The candidate shall demonstrate experience of working with key performance indicators.

- The candidate shall have been accredited and operate a quality assurance programme to ISO 9001.

(The experience shall be attributed to the Organisation that is applying. Where a company claims to have the required experience, it shall be in its current entity.)

- The Candidate shall have a thorough knowledge and understanding of the French labour code:
  - Article R4544-3 Code de travail, including the articles identified below:
  - Article R4544-3 Code de travail,
  - Partie réglementaire (Articles R1111-1 à R8323-2,)
  - Quatrième partie : Santé et sécurité au travail (Articles R4121-1 à R4823-6,)
  - Livre II : Dispositions applicables aux lieux de travail (Articles R4211-1 à R4231-4,)
  - Titre Ier : Obligations du maître d'ouvrage pour la conception des lieux de travail (Articles R4211-1 à R4217-2,)
  - Titre II : Obligations de l'employeur pour l'utilisation des lieux de travail (Articles R4221-1 à R4228-37,)
  - Arrêté du 5 juillet 2024 relatif aux normes définissant les modalités recommandées pour l'exécution des opérations sur les installations électriques ou dans leur voisinage ou pour l'exécution d'opérations non électriques dans l'environnement d'ouvrages et d'installations électriques sous tension aériens et souterrains - Prévention du risque électrique.

- NFC 18-510. Opérations sur les ouvrages et installations électriques et dans un environnement électrique (Operations on Electrical Works and Installations and in an Electrical Environment)
- All management and supervision staff shall have a level of English to the Common European Framework of Reference for Languages (CEFR) B2 and the project manager shall be accredited to CEFR C1. For native speakers an equivalent to a GCSE grade C in English language or literature is the minimum standard.
- The candidate shall operate an office based within any of the IO member state.

## 5 Roles and Responsibilities

Activity	IO	Contractor
Health & Safety	A	R
Permit to work	A	R
LOTO	A	R
Intervention		R
Work	A	R
On call facilities		R
Maintenance	A	R
Lighting	A	R
Inspection & Testing	A	R
Design Office	A	R
Supplies for the material and delivery	A	R
Reports	A	R
Professional advice	A	R
Asset Register	A	R
Scaffoldings installation	R	A
Cherry picker rental and transportation	A	R
Regulatory inspection	A	R
As-built	A	R
Final Acceptance	A	R

*Table 2 Role & Responsibilities*

R = Responsible for organising, performing and for the content.  
 A = Review/Comment/Accept/Approve.

## 6 Safety requirements

The appointed contract shall respect the French labour code in all aspects with regards to Health & Safety.

The appointed contractor shall comply to the highest safety standards and shall only involve properly trained and certified personnel.

The appointed contractor shall maintain a qualified (BAC +2 minimum) health and safety supervisor on site during its operational hours. The individual or individuals shall be nominated. In case of absence for whatever reason a deputy shall be present on site for the full period of the absence. A resume of the Health & Safety supervisor's experience will be requested as part of the tendering process.

All procedures established by the contractor shall be in accordance with the French regulations and shall be subject to harmonization with ITER internal procedures.

The appointed contractor shall not be allowed to deviate from the Permit to Work (PTW) regime and shall accept all supervision on the work to be undertaken.

The appointed contractor's personnel shall be requested to show evidence of internal and external training prior to commencing on site or starting any specialist work.

This includes trade certificates, habilitation electrical certification, habilitation for working at heights, working in confined spaces, habilitation for driving construction site vehicles, etc.

The appointed contractor shall by an internal program at minimum once per three months remind their personnel of the Lock-Out-Tag-Out procedure in a toolbox training session.

The appointed contractor shall be responsible for the safe operation and maintenance of the temporary LV electrical Network and the equipment that is added to the network.

## 7 Indicative Timetable

An indicative timetable for the Management and Maintenance of the ITER Organization's Temporary Electrical Network at the ITER site.

Commence the expression of interest process	Week 22
Issue Pre-qualification package	Week 25
Deadline for receipt of pre-qualification:	Week 30
Issue Call for Tender	Week 38
Deadline for receipt of Tenders	Week 47
Contract Signature	Week 03

*Table 3 Indicative timetable*

## **8 Disclaimer**

The ITER Organization is not committed contractually in any way to those applicants whose applications are accepted. The issue of this Technical Summary does not commit or otherwise oblige the ITER Organization to proceed further with the Management and Maintenance of the ITER Organization's Temporary Electrical Network at the ITER site tender or contract.

Whilst the information contained in this Technical Summary has been formulated with all due care, it shall not form any part of any future contract that maybe signed between the ITER Organization and any party or entity.

The ITER Organization takes no responsibility for the accuracy of any information included in this Technical Summary.

### **Note**

Neither the ITER Organization nor any of the Domestic Agencies that are part of the ITER project shall be liable for any costs incurred by applicants through participation in the call for tender process.