



Procurement strategies for maintenance services

Yo Maeda, Marc Molera

Disclaimer: The views and opinions expressed herein do not necessarily reflect those of the ITER Organization

7 & 8 April 2021

Remote ITER Business Meeting



Presentation outline

1. Introduction
2. ITER Context regarding current and future Operation
3. Global Maintenance Services Contract
4. Schedule



1. General Introduction

- This presentation covers all maintenance activities on ITER site for plant systems which have already been or will be turned over to Operations and Facility Management team before First Plasma.
- ITER has made the choice to subcontract the coordination, the preparation and the execution of Maintenance activities of conventional systems and components.
- The technical perimeter is split into 3 different parts corresponding to the 3 existing areas of responsibility.



1. Introduction : Maintenance purpose and process

The main objectives of Plant Maintenance is to ensure/manage the Legal compliance, the Safety and the Reliability (incl. addressing Availability, Maintainability and Inspectability aspects) of both ITER continuous and pulsed systems and, in that perspective:

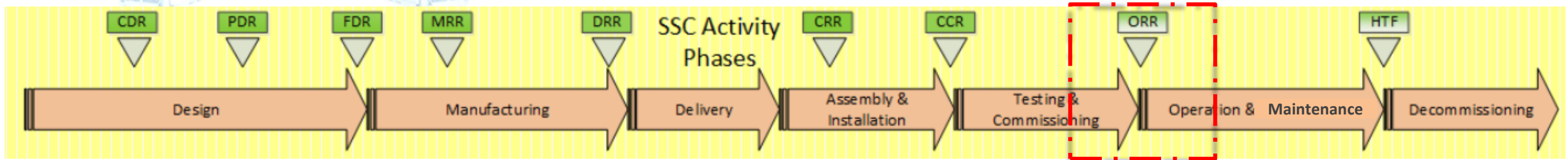
- Plan properly preventive maintenance and inspections
- Execute in due time planned activities
- React quickly and efficiently to unforeseen events (corrective maintenance)



2. ITER context : Operation Division (OPD) main roles

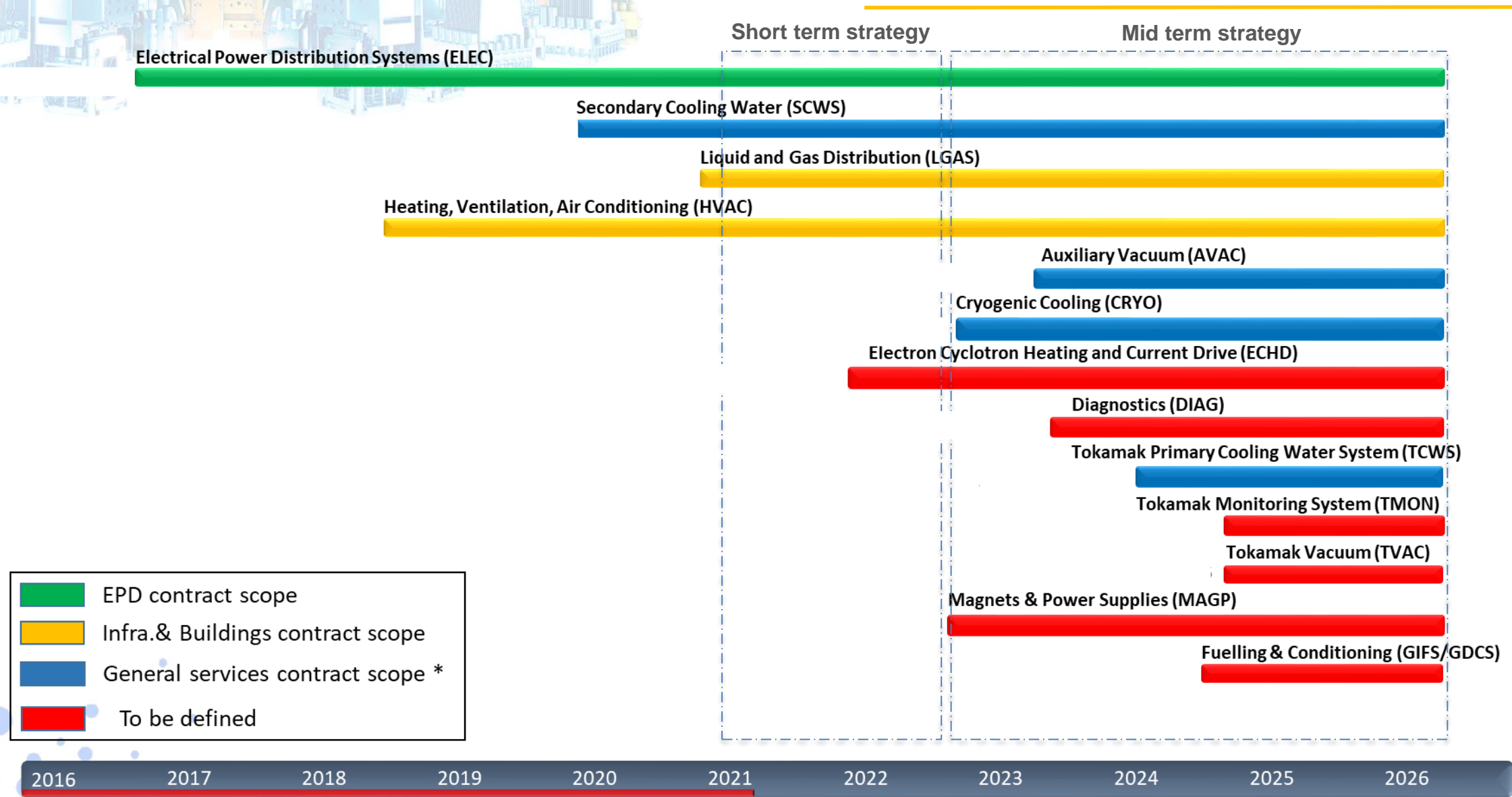
- OPD is responsible for commissioning and temporary Operation (incl. Maintenance) of all ITER systems excluding Infrastructure and buildings and I&C.
- OPD is also responsible to develop tools, procedures and define the strategy for the future operation (incl. Maintenance) of ITER Facility.
- OPD acts as process owner for the preservation of all ITER equipment.
- OPD / EPD operates and maintains the steady-state electrical distribution

2. ITER context: Systems handover to Operations current status



- Some plant systems have already been transferred to OPD for temporary Operation and Maintenance (e.g. Electrical Power Distribution network).
- Other systems have already been transferred to OPD for testing & commissioning (e.g. some Secondary Cooling Water Systems).
- After tests completion, commissioned systems will be progressively transferred to OPD Operation & Maintenance teams for the start of initial Operation and later for integrated commissioning.

2. Handover to Operation & Maintenance sequence (target schedule)



■ EPD contract scope
■ Infra. & Buildings contract scope
■ General services contract scope *
■ To be defined

2. Staged approach Maintenance contracting strategy principle

SHORT TERM

(2021-2022)

MID TERM

(2023-2026)

**Target of this
presentation**

LONG TERM

(2026 onwards)

() out of scope of current contracting initiative*

2. Staged approach Maintenance contracting strategy principle

SHORT TERM

- **Scope:** Immediate fixed scope
- **Period:** 2021- 2022
- **Technical perimeter:** Electrical Power Distribution (SSEN/PPEN), Secondary Cooling Water System, Infrastructure and Buildings
- **Main Disciplines involved:** Electrical HV, Mechanical/Metal works, facility management (incl. HVAC, elec LV, ...)

2. Staged approach Maintenance contracting strategy principle

MID TERM

Target of this presentation

- **Scope:** Progressive / ramp up scope in link with handover process
- **Period:** 2023 - 2026
- **Additional plant systems:** some new systems of Cooling Water, Cryoplant, ...
- **New Disciplines involved:** Instrumentation (incl. metrology and analyzers), Rotating equipment overhaul, ...

2. Staged approach Maintenance contracting strategy principle

LONG TERM

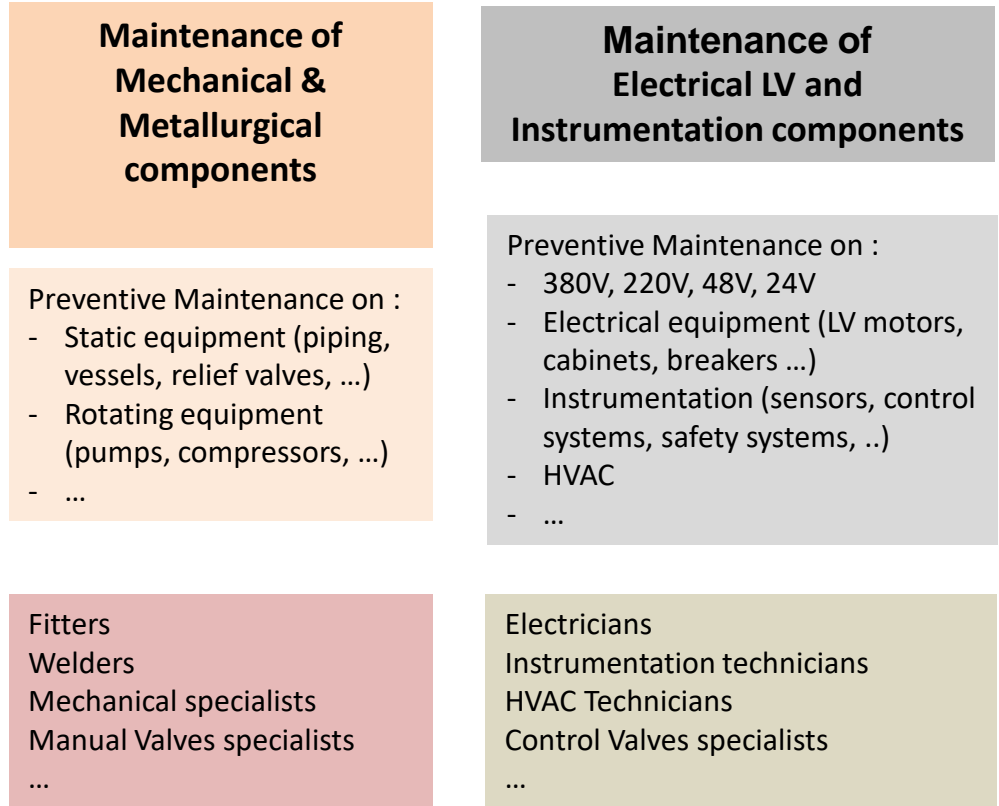
- **Scope:** Full scope
- **Period:** 2026 onwards (post First Plasma)
- **Additional Plant systems and activities:** Long Term Maintenance (LTM) preparation and execution coordination (Cryoplant machinery and Tokamak complex outages)
- **New Disciplines involved:** plant outage management, pulsed Systems (pre-Nuclear) maintenance, ...

2. Main disciplines landscape

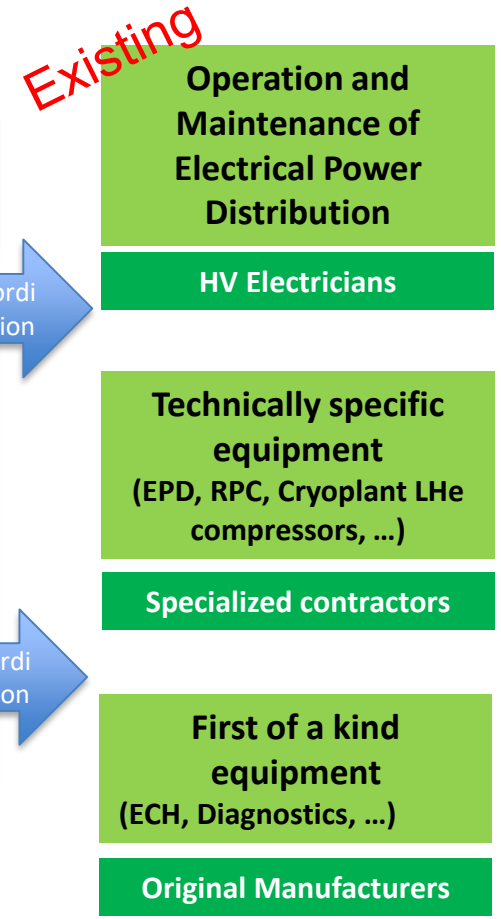
Non core activities



Core activities



Specialized activities



Global Maintenance Services future contract scope

3. Global Maintenance Service Contract (GMSC) principles

- Maintenance of all components turned over to Operations
- Excluding design modifications / upgrades
- General coordination of all involved disciplines and contractors
- Coordination, supervision and receiving all the sub-contracted activities
- Based on obligation of results principle
- Strong incentive to propose any upgrade or modification in order to optimize components safety, reliability or integrity level or make maintenance in more efficient way

3. GMSC scope of work (1/2)

SCWS and Cryoplant maintainable components quantities *

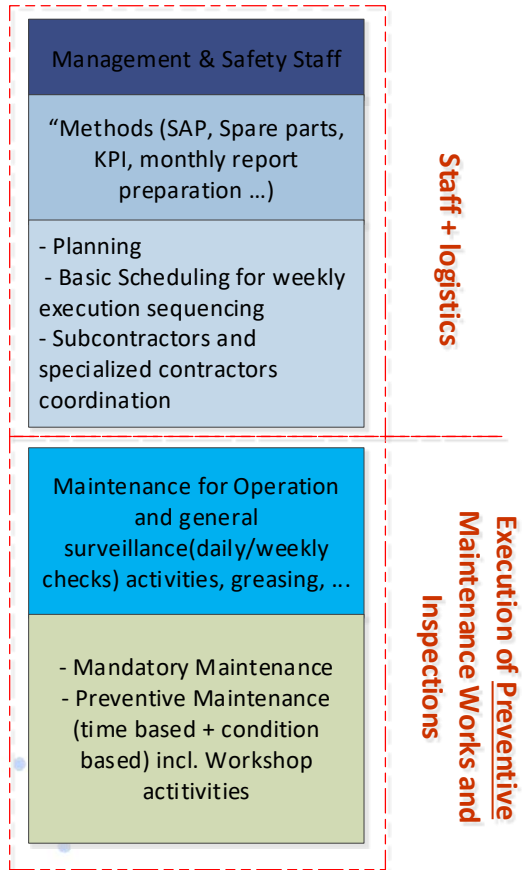
Mechanical/Metal	Rotating equipment	100 pumps
	Static equipment	250 heat exchangers
		250 vessels/tanks
	valves	9000 manual valves
1000 safety valves		

Elec LV / Instrumentation	Instrumentation / valves	900 control valves
		2500 sensors
	Electricity LV	100 variation frequency drives
		100 electrical motors
Analyzers	50 analyzers	

(*) Orders of magnitude at 2025-26 horizon

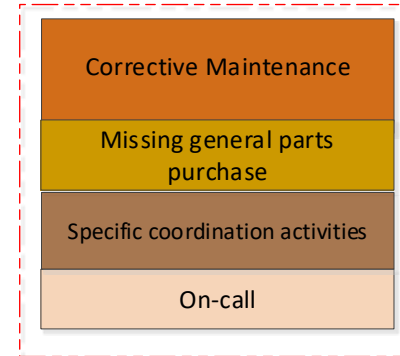
3. GMSC Scope of Work (2/2)

Fixed / Variable Scope

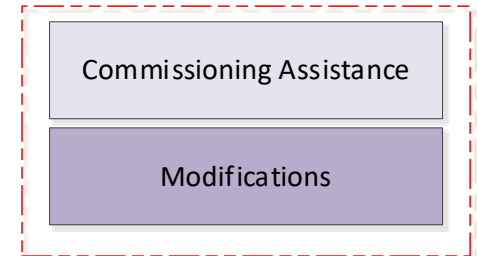


Variable Scope

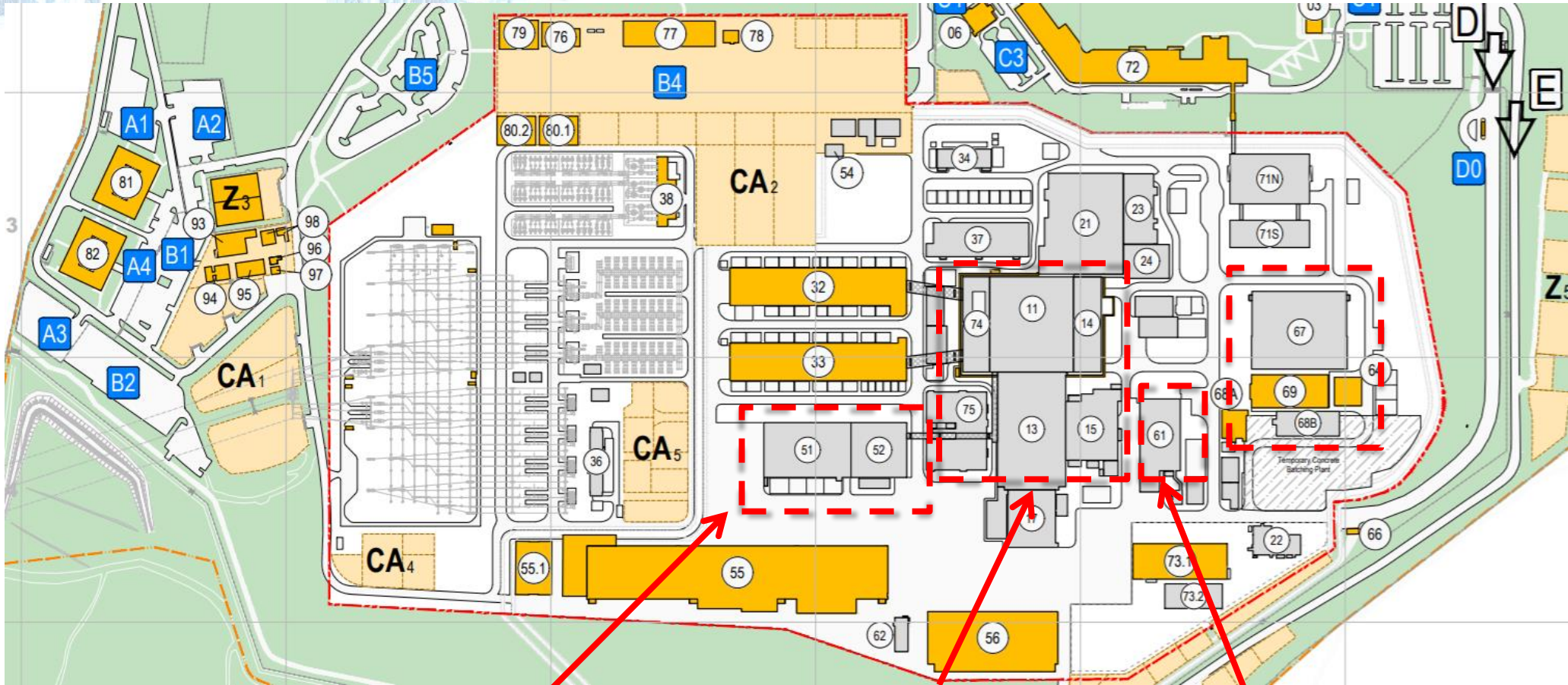
Failures / unexpected events



Specific Orders



3. GMSC Geographical Perimeter



Cryoplat

Tokamak

Secondary Cooling
Water System

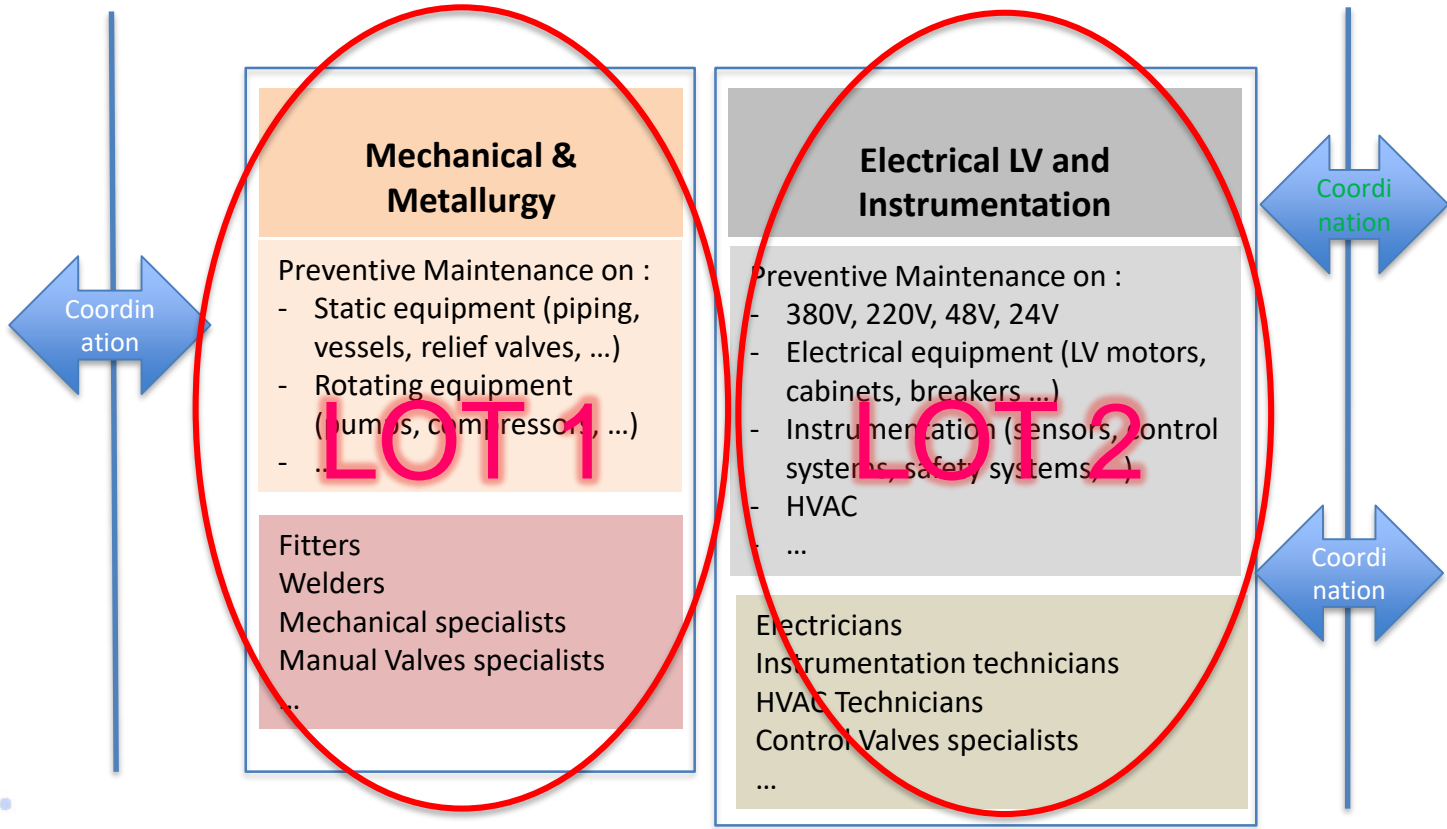
- Cooling water system
- Diagnostics
- ECHD
- ...

3. GMSC Procurement Options under review

Procurement Option 1

Non core activities

- Scaffolding
 - Insulation
 - Lifting
 - ...
- Shared services contractors (tbd)



Non conventional / very specific components

- Technically specific equipment (RPC, Cryoplant LHe compressors, ...)
- Specialized contractors
- First of a kind equipment (ECH, Diagnostics, ...)
- Original Manufacturers

3. GMSC Procurement Options under review (Option 1)

- **2 contracts covering Maintenance of all continuous plant systems conventional components:**
 - * one for Metal/Mechanical discipline
 - * one for Elec LV/Instrumentation discipline
- Some other contracts for specialties (e.g. Elec HV, CPS ...) to be tendered separately
- With central coordination and contract management by IO
- Contracting strategy for non core services to be defined

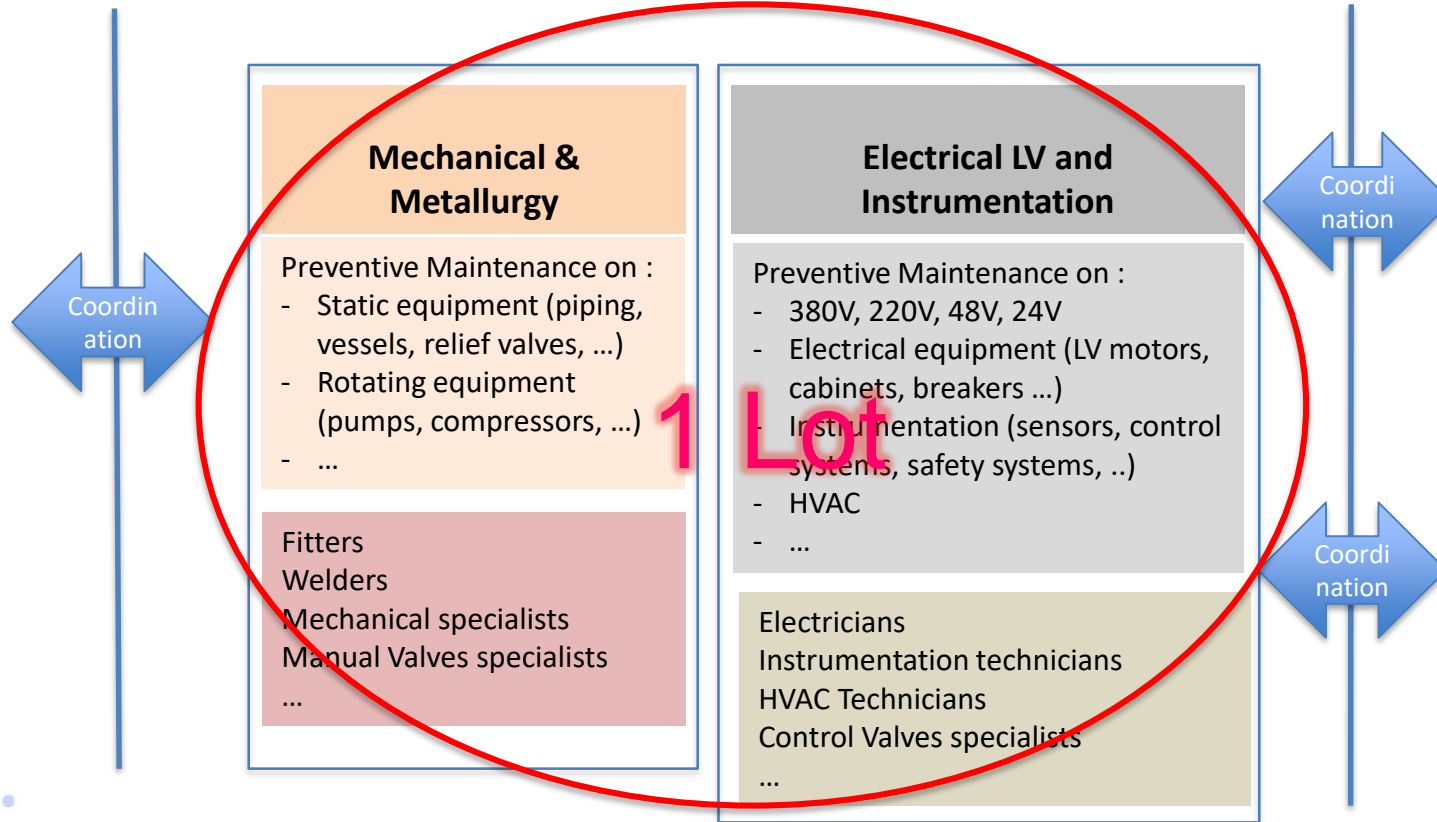
3. GMSC Procurement Options under review

Procurement Option 2

Non core activities

- Scaffolding
- Insulation
- Lifting
- ...

Shared services contractors (tbd)



Non conventional / very specific components

Technically specific equipment
(RPC, Cryoplant LHe compressors, ...)

Specialized contractors

First of a kind equipment
(ECH, Diagnostics, ...)

Original Manufacturers

3. GMSC Procurement Options under review (Option 2)

- **Only 1 main contract** covering Maintenance of **all continuous plant systems conventional components** and **all disciplines** incl. centralized SHS and maintenance engineering/method coordination
- With central Master scheduling & coordination entity and contract management by IO
- Some other contracts for specialties (e.g. Elec HV, CPS ...) to be tendered separately.
- Contracting strategy for non core services to be defined.



3. GMSC Procurement Options under review

For both Options 1 and 2

- IO will place Framework Contract(s) where the volume will be discussed on annual basis.
- The scope of the Framework Contract(s) will include the activities in Slide 15.

4. Schedule

- **Global Maintenance Services Contract(s) for Mid term period**
 - Request For Information (RFI) within one or two weeks after RIMB
 - Call For Tender (CFT) initiated in Q4 2021