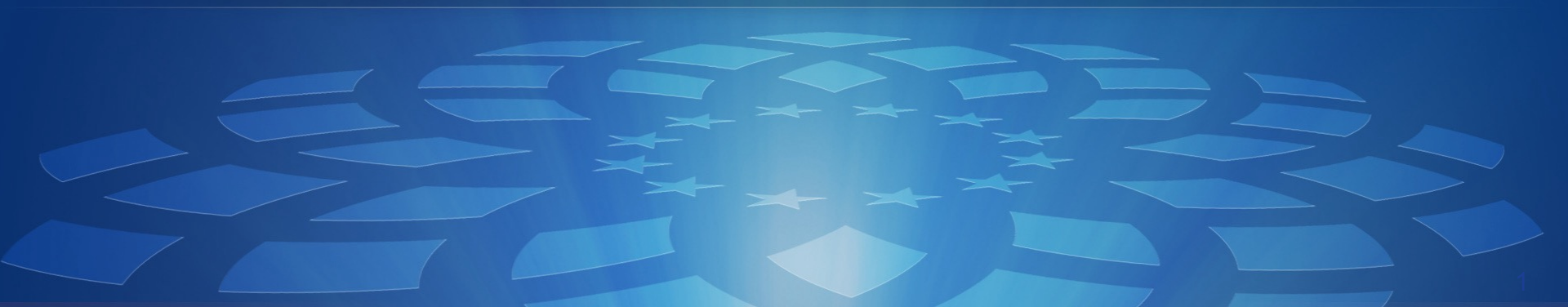




**FUSION
FOR
ENERGY**

Organisation of Site Activities JT-60SA Machine Enhancements

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BA Phase I

During BA phase I, there were two main areas where site work were included:

- Cryoplant
- Power supplies

In both cases:

- EU industrial partners managed the installation activities
- The site work was basically sub-contracted to Japanese entities
- EU personnel acted as site supervisors / managers but were generally not permitted to do the work

Installation and commissioning included in the scope of EU for:

- Quench Protection Circuits (Consortio RFX)
- Switching Networks Units (F4E)
- Base PS converters (CEA & F4E)
- ECRF PS (F4E)
- On-site activities: mainly installation and testing of electrical equipment, but also mechanical activities (movement of 13 tons transformers, welding of supports,)
- Critical points about the work:
 - **Electrical work** requires a Japanese licence. European licence/qualification is not valid in Japan. It is possible to work without Japanese qualification only if voltage is under 50V.
 - **Special mechanical work** (welding, crane operation, forklift operation, hydraulic bending etc.) requires a Japanese licence.
 - **Work in radiation controlled area** requires a Japanese licence

→ **As a result, all on-site installation and commissioning activities were sub-contracted to Japanese suppliers, with EU suppliers supervision**

Formally, QST is responsible for the site work for the Enhancements

Typical PA text here:

- [T.R.54.] The equipment shall be designed for efficient installation and efficient maintenance.
- [T.R.55.] QST shall install the equipment and shall determine the necessary installation procedure.
Any specific installation requirements (e.g. lifting points, tightening torques, handling precautions etc.) shall be defined in an Installation Guide prepared by the Contributor.
- [T.R.56.] A Commissioning procedure shall be jointly developed and jointly implemented by QST and F4E / the Contributor.

Given that QST is responsible but not necessarily expert:

- More emphasis must be placed on the preparation:
 - For simple assemblies of hardware this can be done with simple procedures
 - For more complicated / sensitive assemblies / testing / adjustments, much more detail will be required and iteration may be required with QST to finalise any procedure
- Before arrival on site:
 - Provide written procedures to QST (will be translated to Japanese by QST)
 - Present procedures (like training) to ensure the procedures are well understood
 - Ensure plenty of time for iteration / questions is allowed during the preparation
- On site:
 - An English speaking QST representative will be assigned for entry to any work areas (including the torus hall), and will remain at all times
 - EU resource will be expected to oversee / support i.e.
 - Ensure the procedures are correctly followed
 - Provide additional information if requested
 - Stop work if necessary

Organisation for on-site activities

- Formal appointment of **management and safety roles**
- **Work Site Survey Meeting** with all stakeholders organized in Naka at least 90 days before start of activities
- Request for **start of on-site work** submitted 60 days before start of activities including:
 - List of personnel, with qualification certificates
 - Schedule of on-site Work
 - List of Main Tools and Equipment
 - List of Materials to be stored on-site (with explicit reference to Hazardous Materials)
 - Estimate of Quantity and Type of Industrial Waste
 - Operative Safety Plan
 - Copies of Liability Insurance Certificate(s)



Role definition for on-site activities

- During on-site activities, **daily meeting** (15 minutes) with QST and all subcontractors involved in activities in the same room
- Weekly submission of **updated installation plan**