



ESS
bilbao



**EUROPEAN
SPALLATION
SOURCE**

Acquisition strategy, schedule and budget

Consorcio ESS-BILBAO & Instituto de Fusión Nuclear & ESS-ERIC

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Acquisition strategy

Acquisition strategy

Procurement process following the Spanish laws for Public institutions

ESS-Bilbao is a public body thus we need to follow the procedures for public procurement. Based on the singularity of the product and the QA analysis process developed by CEIT, ESS-B will justify that there is a limit number of suppliers that can fulfill the technical requirements. This supplier will be “invite” to the Call for Tenders.

Spallation material Quality control

ESS-Bilbao has established the criteria that has to be fulfilled by the supplier and the tests that have to be completed in the acceptance process.

- Material requirements: Factory test under Supplier responsibility. Documentation will be reviewed by ESS-Bilbao before shipping to Spain.
- Acceptance test: Testing process to validate the “Supplier factory test” under ESS-Bilbao responsibility.

Acquisition strategy

Material requirements:

- **Trazability:** The bricks will be identify individually along all the production process.
- **Material produced by hot rolling:** The material will have directional structure associated with the hot rolling process with clear grain elongation along the rolling direction. Annealing processes after the rolling should be avoided.
- **Compressive residual stresses:** The material will have compressive residual surface stresses in the longitudinal and transverse direction above **500 MPa**. The residual stresses will be measured by X-ray diffraction or equivalent technique (ASTM E2860-12)
- **Chemical composition:** **O and N concentration below 30 ppm.** (ASTM E1569-09)
- **Chemical composition:** **C and S concentration below 30 and 10 ppm** (ASTM E 1941-10)
- **Density:** The minimum admissible density should be **19.0 g · cm³**. (ASTM B311-12)
- **Dimensional control:** Bricks dimensions will be control according to the drawings.

Acquisition strategy

Material requirements:

- Tensile fracture stress in longitudinal direction: The mean RT fracture stress on longitudinal direction will be above **600 MPa at room temperature** (ATSM E8/E8M-15a)
- The supplier will provide the statistical probability distribution and its standard deviation. This information will be consider for the final definition of the number of pieces to be tested in the acceptance process.

Acquisition strategy

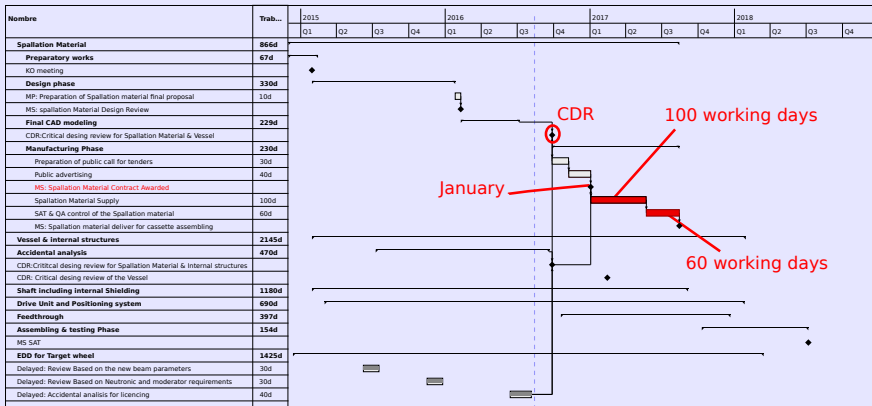
Acceptance test: (subcontracted to a qualify third party)

- Metrology: A significant number of samples (100) will be individually measured to check the external dimensions of the brick (including density).
- Tensile test: Statistical sampling plan will be defined according to the data provided by the supplier (40-100 bricks). The tensile stresses will be evaluated by means of bending test at room temperature in longitudinal direction.
- Structural inspection: Three samples from the tensile test population (those having the lower, mid and highest fracture stress) will be analyzed by SEM-EBSD metallography in longitudinal direction. The analysis will consider large enough areas containing a number of **grains larger than 400**.
- Surface residual stress: Three samples will be analyzed by means of X-ray diffraction [ASTM E2860-12].

Schedule

Schedule

Planning based on suppliers production time. (Quotation example by AT&M)



Schedule

Planning based on suppliers production time. (Quotation example by AT&M)



安泰科技

.....Quotation

Refractory Metal & Ceramics Branch, Advanced Technology & Materials Co., Ltd. (AT&M)
Zbre C, 10 Yongcheng North Rd, Haidian, 100094, Beijing, China.

To: Dr. Fernando ESS Bilbao

From: Mary

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E-Mail: mary@atl.com.cn

CC:

Pages: 1

Subject: Project Quotation

Date: 2016/9/14

S/N	Part No.	Description	Material	Qty /pcs	Unit Price/pc	Lead Time
1	80*30*10	Tursten Bar	W	1	██████	45DAYS for 7000 pcs
The Quotation is cover all of QA Requirement.						
Currency		VAT		Period of Validity		
USD		VAT Excluded		180Days		

Terms and Conditions:

- 1) This quotation is based on the drawing, specification and requirement provided. Should there be any variation, the quotation is permitted to be negotiated further.
- 2) This quotation is based on the material cost at the moment when the quotation is issued. Should there be any fluctuation of more than 5%, the quotation is permitted to be negotiated further.
- 3) This quotation is based on the currency exchange rate at the moment when the quotation is issued. Should there be any fluctuation of more than 3%, the quotation is permitted to be negotiated further.

Approval: _____

Budget

Budget

Target Wheel, shaft and drive unit: ESS-Bilbao in kind contribution

The total in kind contribution value for the complete package is 8.4 M€. Based on the industrial quotations we will be on cost (10 % contingency included).

Conclusions

Conclusions

Summary of sensitivity cases

- The proposed process for the procurement can guaranty a high quality standard in the material.
- The schedule is feasible including safety margin
- The risk associated to the budget is acceptable for ESS-Bilbao.