SPES RFQ (WP08): Construction sequence and schedule

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RFQ Production Sequence

The company will take care of detailed design end production, the successful completion of the first electrode will unblock the construction of the remaining 23.

1. Forged tanks procurement
2. SS tank machining
3. **Copper electrodeposition on the tank**
4. Electrode production (Copper and SS procurement, deep hole drilling pre-machining brazing, final milling, metrology).
5. **Module assembly at LNL and tests (RF, vacuum etc)**
6. Ancillaries (power coupler, tuners, dummy and final end plates, etc)
7. Support construction
8. Whole RFQ assembly
9. Ancillary systems:
    1. RF system (incl. Amplifier refurbishment, waveguides etc)
    2. Vacuum system
    3. LCS
    4. Cooling system

RFQ part List

1. Tanks (n=6)
2. Electrodes n. 24
3. RF Components
    1. Couplers 1
    2. Pick ups = 16
    3. Tuners 84
    4. Waveguide system 1
    5. RF Amplifiers 1 (already existing to be adapted from 175 MHz to 80 MHz)
4. Vacuum components (8 manifolds)
5. End plates n.2
6. Cooling skid n.1
7. 1 Support and alignment system

RFQ major procurements

Major Procurements	Name	Notes
Tank forged material (stainless steel)	Company 1	similar tube delivered to INFN
Forged OFE Copper	Company 2	
Stainless steel components	Company 3	small parts
Tank machining	Company 4	
Tank copper plating	GSI	
Electrode machining, brazing, vacuum and water tests.	Company 5	INFN prototypes
Coupler	Company 6	
RF lines	Company 7	6” 1/8 (or 9” 3/16) lines
RF Amplifier adaptation	Company 8	Amplifier produced by DB Elettronica
RF window	company 9	Same kind of window was produced by MEGA industries for IFMIF RFQ
Supports	Company 10	
Cooling skid and cooling circuit components	*Company 11*	TRASCO RFQ skid is compatible
Local control system		As for IFMIF RFQ, internal design and components procurement

Time schedule

- Start of tender for electrodes : dec 2015
- Start of electrode production sept 2016
- First set of four electrodes : jan 2017
- Completion of all 24 electrodes sept 2018
- Start of tender for tank : mar 2016
- Start of tank production dec 2016
- Completion of all tanks (incl. Cu deposition) dec 2018
- Assembly and low power testing jun 2019
- High power tests sept 2019

Ancillaries (power coupler, tuners, dummy and final end plates, etc) as well as Support construction, RF system (incl. Amplifier refurbishment, waveguides etc), Vacuum syste, LCS, Cooling system go in parallel.

Time schedule (2)

DIAGRAMMA DI GANTT

	Task Name
0	**PROGETTO SPES**
1	**WP-B8 - RFQ**
2	Prototypes and start of material procurement
3	Studi RF
4	Order of Cu for 1st module
5	Thermo-mechanical studies
6	Preliminary mechanical design
7	Tender preparation for external detailed mechanical design and complete realization
8	Tender Launch progettazione esterna e costruzione completa
9	Tender
10	Detailed design and construction of RFQ (low-P RF tests of prototype, brazing at LNL, perhaps Cu-plating at GSI, ...)
11	**Ancillaries**
12	RF System Adaptation, Couplers and tuners production
13	Site preparation (cooling system, vacuum system implementation, infrastructures)
14	Access control system modification for RFQ in ALPI-Area 2
15	Assembly and low power tests (tuning)
16	High power tests
17	RFQ completed
18	RFQ control (local CS: à la IFMIF, tipo Antoniazzi-Montis)