FINNISH SUBCONTRACTING IN THE NUCLEAR POWER PLANT PROJECT

PÖYRY

FINNUCLEAR RY
FinNuclear Association

Workshop
September 5th, 2012

PROJECT STAGES AND INTERMEDIATE TARGETS

Project stages	Targets	Scope and time schedule
1. Subcontracting dynamics & typical subcontracts	Surveying of typical subcontracting of a nuclear power project and analysing of procurement behaviour and the principles of supplier selection.	15.2.2012
2. Defining of subcontract packages	Defining of subcontracting packages and analysing of the current status of Finnish subcontracting operations and strengths in cooperation together with subcontractors and FinNuclear to verify the packages.	Typical subcontracts of a nuclear power project formed into subcontract packages March 2012
3. Recommendations as focus areas of Finnish subcontracting	The focus areas, where the Finnish subcontractors have the best potential for success, will be defined among the subcontracting packages. These focus areas will be surveyed in more detail regarding the subcontractors and their competitiveness in cooperation with the subcontractor companies.	2-3 selected subcontract packages June 2012
4. Recommendations for actions to improve competitiveness in chosen focus areas	Recommendations for actions to improve competitiveness will be created on both short and long term taking into consideration the input vs. profit outlook, success factors and current problem issues.	August 2012
5. Road map	A road map plan will be prepared of the recommended actions incl. a time schedule	December 2012

LIST OF SYSTEMS

Systems (TI, NI and BoP) and partial components	System delivery: Full delivery	System delivery: Partial delivery
Main cooling water system	x	x
Sampling system (module-delivery)	x	
Technical circle	x	
Clean water utility	x	
Sewage treatment and neutralising system	x	
Auxiliary boiler system OR Temporal heating system if layout allows (module-delivery)	x	x
Emergency power supply	x	
Pneumatic systems (module-delivery)	x	
Gas storage system	x	
Air removal system for steam turbine condenser (module delivery)	x	x
Chemicals feeding systems	x	
Drain collection systems	x	
SC3 and EYT Piping	x	
SC3 and EYT Painting and coating	x	
SC3 and EYT Piping supports	x	
SC3 and EYT Piping insulation	x	x
SC3 and EYT pumps	x	x
SC3 and EYT valves	x	x
SC3 and EYT heat exchangers, pre-heaters and containers	x	x
Fireprotection systems and fire fighting systems	x	x
Air-conditioning systems	x	
Waste management	x	
Condensate treatment system	x	
Condensator cleaning system	x	x
Lifting devices	x	
Laboratories	x	x
Radiation monitoring systems and equipment	x	x
Radiation protection of workers	x	x
Radiation monitoring in the environment of a nuclear power plant	x	
Steam generator blowdown demineralizing system	x	
Essential service water system	x	
Closed cooling water system (TI & NI separate)	x	

System delivery was divided into two categories

- Full delivery means, that the system can be delivered by Finnish subcontractors and the components are manufactured in Finland
- Partial delivery means that the Finnish subcontractors can deliver the whole system, but some of the important components have to be supplied from abroad (e.g. main cooling water pumps)

The important components of the systems were identified to adjust the ranking

- For example IAEA TRS 396 “Economic Evaluations of Bids for Nuclear Power Plants” was considered
- Mainly safety class 3 and EYT components and equipment are included in the list

IDENTIFYING THE 2-3 MOST POTENTIAL SYSTEMS– DRIVER PRIORITIZATION

Priority 1.	Delivery value > 10 milj. EUR
	9 systems passed
Priority 2.	Existing national supply to conventional or nuclear projects
Priority 3.	Extension potential (other business sectors or European NPPS)
Priority 4.	Capability – Existing with a good growth opportunity (not just acquisition)
Other criteria	One full and partial delivery system will be selected for further analyzing
	System from NI or TI area – BoP systems will come most likely for Finnish suppliers anyway

Selected 2-3 systems for further analyzing

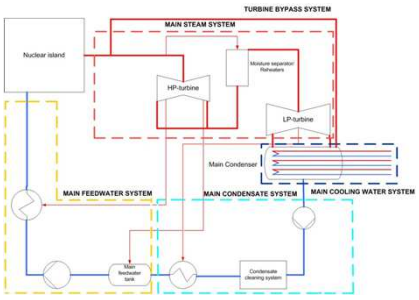
SUMMARY - THE 3 MOST POTENTIAL SYSTEMS BASED ON TOTAL SCORING EMERGED BY EVALUATING THE DRIVERS

The selected systems:	Reason behind a selection
• Main cooling water system	• High delivery value • High extension potential • Several companies from different sectors to be included in a consortium
• Consortium - SC3 and EYT Piping, coating, piping supports and insulation	• High delivery value • A large supply package • Combines several companies from similar business sector
• Waste management	• High delivery value • Potential for innovative technology development • Several companies from different sectors to be included in a consortium

Scope and boundaries - Piping

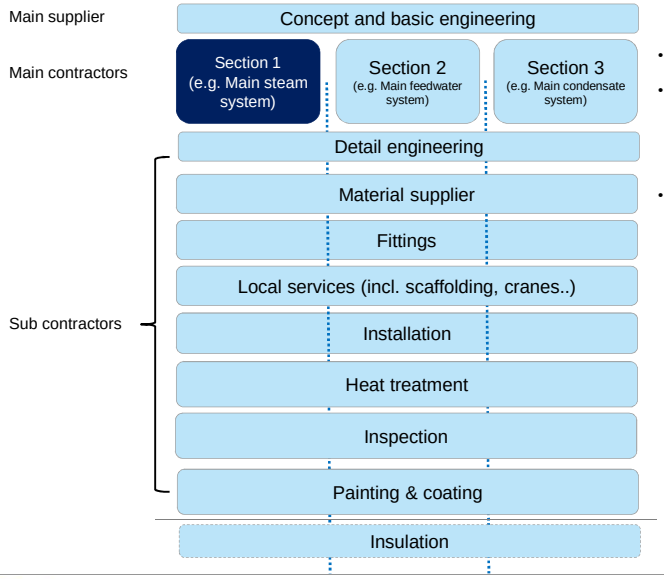
- Scope
  - All piping in NPP which belongs to lower safety classes. Some SC2 piping is included (parts of the Main feedwater system and Main steam system in BWR plants)
  - Piping and supports prefabrication, installation (incl. valves and measuring devices), painting and coating, insulation
  - Piping value chain covers all functions throughout the NPP lifecycle including pressure test and after sales
  - The consortium shall include companies from different sectors like engineering, manufacturing and installation

MAIN PIPING IN TURBINE ISLAND



- Largest amount of SC3 and EYT piping is located in TI
- TI piping could be divided into large supply packages, for example to
  - Main steam system
  - Main cooling water system
  - Main condensate system
  - Main feedwater system

CONSORTIUM MODEL FOR PIPING (OPTION 1)

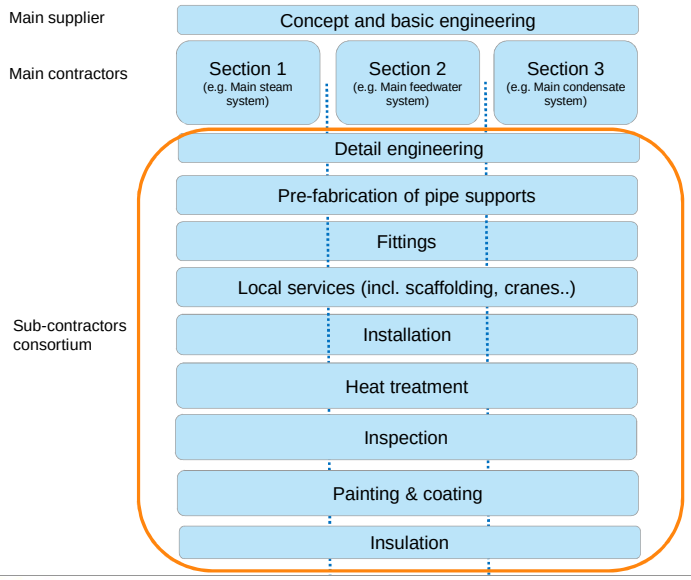


Main responsibilities

- Prefabrication: pipes and pipe supports
- One of main sub contractors will be main contract partner

- Steel material supply for pipe manufactures

CONSORTIUM MODEL FOR PIPING (OPTION 2)



Main responsibilities

- Prefabrication: pipes

- All sub-contracting
- Prefabrication: pipe supports
- One of main sub-contractors will be main contract partner

RANGE – VALUE OF PIPING SUPPLY PACKAGES

- The estimations vary depending on the scope of the supply packages

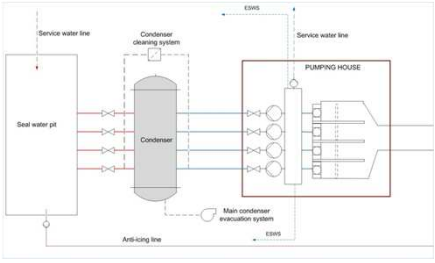
VALUE OF PIPING PACKAGES		~xx M€
Division of supply	**Details**	**%**
Materials	Including pipes, pipe supports and fittings[1)]	40-50
Design	Detail design, Including licensing documentation[2)]	5-10
Installation	Including heat treatment, painting and coating[3)]	20-30
Local services	including scaffolding, lifting	~3
Inspection	Covers the whole supply chain[1)]	5
Insulation	Can be separated from the supply package	15-20

[1)] Prefabrication included
[2)] Concept and basic design from the plant supplier
[3)] If any

Scope and boundaries - Main cooling water system

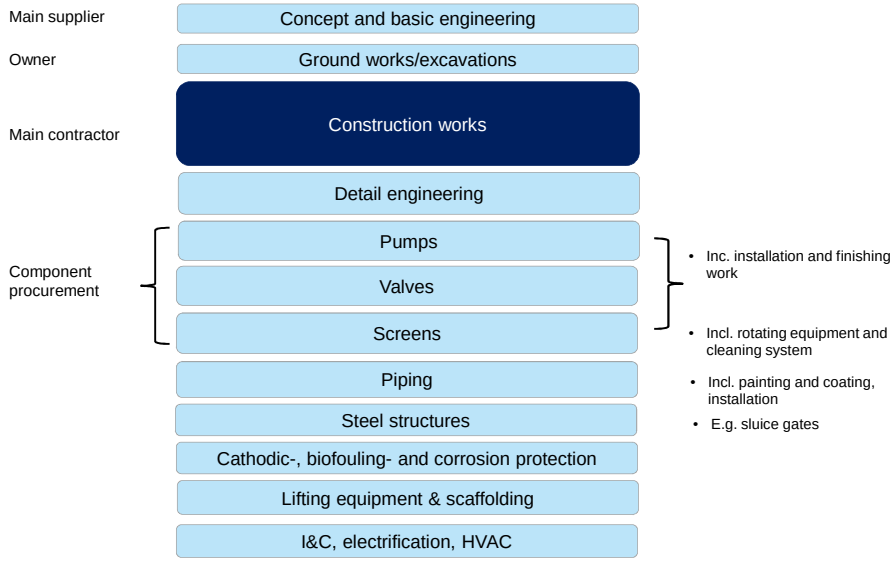
- Scope
  - Safety class of the system and all components is limited to 3 and EYT
  - Other cooling lines connected to main cooling water system in SC 2 excluded from the scope (e.g essential service water system)
  - Main parts of the system
    - Water intake structures
    - Pumping house
    - Outfall culvert
    - Anti-icing system
  - Components
    - Piping
    - Valves
    - Pumps
    - Screens
    - Sluice gates
    - Measuring devices
    - Cathodic protection

MAIN COOLING WATER SYSTEM

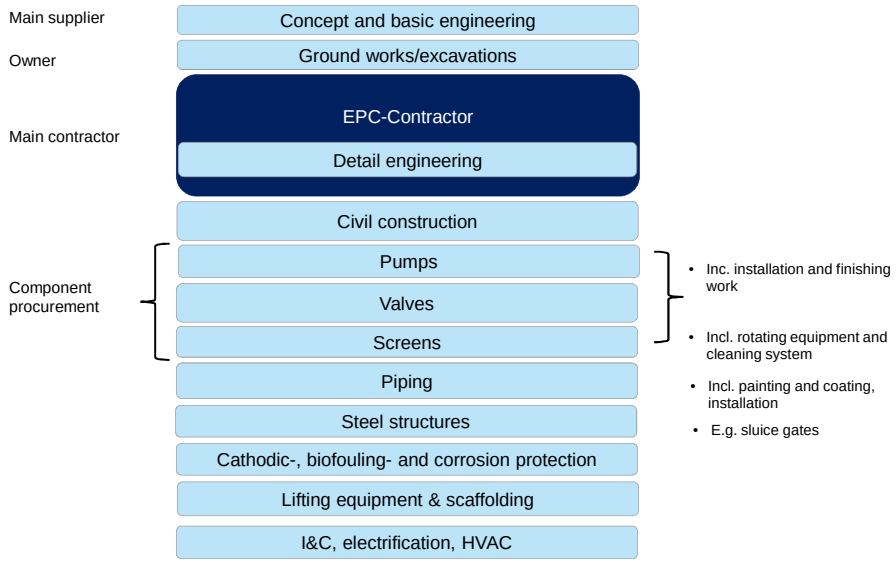


- Interconnections with other systems
  - Piping from piping consortium
  - Civil works from construction consortium
    - Channels and tunnels
    - Pumping house
    - Underground pipelines, water basins
    - Water intake structures

CONSORTIUM MODEL FOR COOLING WATER SYSTEM (OPTION 1)



CONSORTIUM MODEL FOR COOLING WATER SYSTEM (OPTION 2)



RANGE – VALUE OF COOLING WATER SYSTEM

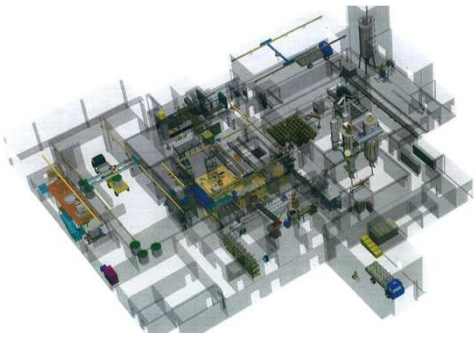
- The estimation of the scope of supply covers the main cooling water system.
- Enclosing underground structures of the service water systems (NI and TI) could add even > 20 M€ to the total value (value depends on the plant concept and layout)
- Ground works and excavations not included in the estimation

TOTAL VALUE OF THE SYSTEM (rough estimation)		~50 M€
Division of supply	**Details**	**%**
Civil works	Pump station, outlet structures[1)]	50-60
Components	Pipes, pumps, filtering equipment, cranes, HVAC	30-40
Electrical and I&C		1
Installation	Process and mechanical	5
Design	Detail and basic engineering, including licensing documentation [2)]	5-10

[1)] Civil works including supporting steel structures and concrete structures
[2)] Concept design from the plant supplier

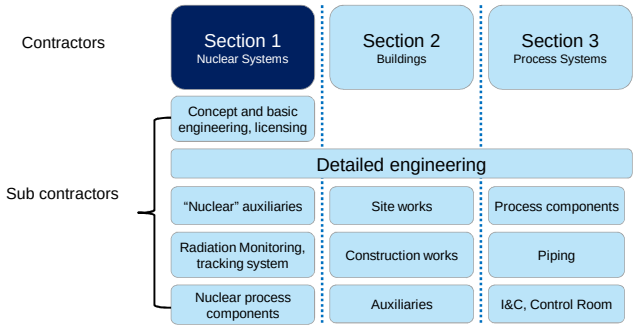
Scope and boundaries - Waste management system

- Scope
  - Waste water management
  - Liquid waste management
  - Solid waste management
  - Gaseous waste management
  - Decontamination system
  - Auxiliary systems such as
    - Handling, lifting and transport equipment
    - Waste tracking
    - Grouting system
    - Radiation monitoring systems
    - Waste packing system
    - Auxiliaries



- Open areas in the scope
  - Size of the structures depends on:
    - The amount of waste produced (reactor type and plant design)
    - If some operations are out of scope (e.g. solidification), much smaller structures may be required
    - Some waste management functions may be integrated to other buildings
  - Differences of the customer
    - Owner's existing facilities (e.g. liquid waste conditioning) in the site?
    - Owner's preferences with the waste management system
    - Plant supplier's existing experience

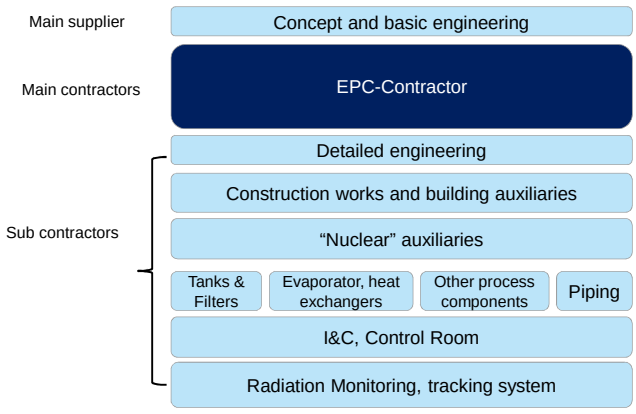
CONSORTIUM MODEL FOR WASTE MANAGEMENT (OPTION 1)



Main responsibilities

- Each contractor would have an EPC responsibility of the dedicated scope
- Section 1 contractor expected to take leader role
- Technologies, layout, PI&D, licensing, etc.

CONSORTIUM MODEL FOR WASTE MANAGEMENT (OPTION 2)



Main responsibilities

- Technologies, layout, PI&D, licensing, etc.
- One of main sub contractors will be main contract partner
- Main contractor could form a consortium to form main supplier
- Building, piping, HVAC, etc.
- Buildings, HVAC, lighting, security, etc.
- Controlled area drainage, ventilation, etc.
- Delivery of process components
- Design and delivery of process control, control of "nuclear" auxiliaries
- Area, personnel, waste, process monitoring, database & tracking

RANGE – VALUE OF WASTE WATER MANAGEMENT SYSTEM

- Scope of supply covers the nuclear waste water management system (both treatment and storage) and liquid waste management (solidification or drying)
- Ground works and excavations not included in the estimation (assumed client's scope)

TOTAL VALUE OF THE SYSTEM (rough estimation)		~25 – 60 M€
Division of supply	**Details**	**%**
Civil works	Processing plant, storage facilities	10 – 15 %
Building auxiliaries	HVAC, power supply, lighting, etc.	10 %
Process systems	Water cleaning equipment, tanks, pipes, pumps, etc. (max. figure includes solidification, minimum drying)[1)]	40-50%
Other systems	I&C, control room, security, radiation control and monitoring	10 %
Design	Basic and detailed design (nuclear & non-nuclear	15 %
Other	Project management, QA/QC, licensing support, supervision, 3rd party cost	10 %

[1)] Solidification covers the largest value, but can be easily limited out of the scope, but minimum drying is required in liquid waste management

CONSORTIUM DEVELOPMENT STEPS

Main milestones	Key tasks	Timing
Workshop	**Introduce the project for potential FinNuclear participants**	September 5th
	Additional discussions & Internal decision to participate in a group	
Potential consortium group - FinNuclear members	**Sign NDAs** **Kick off the consortium group**	End of September
	Introduce potential consortium to vendors Discussions with potential "external" companies	
Potential consortium group – All participant	**Sign NDAs** **Kick off the final consortium group**	October
	Formulate & launch the consortium	
Consortium established	**Sign consortium agreements**	November
	Introduce consortium for buyer	
RFQ from vendor	**Prepare an offer**	Year 2013