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|  | | Purchase Technical Specification | | | | | | | |
| | | Číslo dokumentu / Document no. PNM34481967 | | | | | | Strana / Sheet 1 z of 28 | |
| Projekt / Project MOCHOVCE POWER PLANT Completion of Units 3 and 4 | | Stupeň dôverylosti / Security Index Company Use / P | | | | | | | |
| Názov / Title PURCHASE TECHNICAL SPECIFICATION FOR MECHANICAL AND PIPING INSTALLATION WORKS OF CLASSIFIED AND NON CLASSIFIED LINES (Ex. Job M48B)- UNIT 4 | | | | | | | | | |
| Komponent / Component | | Typ dokumentu / Document Type | ST | Disciplína / Discipline | I | Súbor / File | PNM3448196701 | | |
| Scope of issue / Účel vydania | PO | | | BT komponentu Component safety class: II,III,NC | | | | | |
| Blok / Unit | 4 | PS/DPS/SO 4.04, 4.05, 4.07, 4.26, 4.27 set/subset/c. Structure | | | | | | | |
| REV | Popis zmeny / Description of Revisions | | | | | | | | |
| 00 | First issue. | | | | | | | | |
| 01 | Change of Title and Scope of work of PTS: removed the SoW related to M048A part (moved to PTS PNM34482081) | | | | | | | | |
| 02 | Removed from scope of work: Site Inspection and Inventory and other updates. | | | | | | | | |
| 03 | Chapters: 1 and 13, revised. | | | | | | | | |
| 03 | 04/12/17 | PO | | | | | | | |
| | | | D.Kaczmarek | G.Messina | M.Sasko | | M. Nesa | M. Şerban | C. Edde |
| REV | Dátum / Date | Účel / Purpose | Spracoval / Prepared by | Spolupracoval / Co-operations | | Kontroloval / Checked by | Overil / Verified by | Akceptoval / Accepted by | Odsúhlasil / Approved by |

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1 EXECUTIVE SUMMARY



Scope of the present Purchase Technical Specification is to define activities of the original scope of Job M48B (previously assigned to other contractor) for Unit 4.

1.1 TERMS AND ABBREVIATIONS

Terms

| | |
|----------------------|--|
| Client | Slovenske Elektrarne (SE) |
| Contractor | Other Companies involved in MO34 completion under SE Coordination |
| Classified Equipment | Classified Equipment as per Decree 430/2011 UJD SR and provision of Basic Design |

Abbreviations

| | |
|--------|--|
| BD | Basic Design |
| CI | Conventional Island |
| CSMS | Comment Sheet Management System |
| DD | Detail Design |
| DPS | Elementary Subsystem / Dielci Prevadzkovy Subor |
| DPVs | Partial Project Outputs |
| EPS | Engineering Plan and Schedule |
| MO34 | Mochovce NPP Unit 3 and 4 |
| NI | Nuclear Island |
| NPP | Nuclear Power Plant |
| PS | Elementary System / Prevadzkovy subor |
| SE | Slovenske Elektrarne |
| EPS | Engineering Plan and Schedule |
| QCP | Quality Control Plan |
| QMS | Quality Management System |
| QP | Quality Control Plan |
| PS | Number used to identify elementary system according to functional system name |
| DPS | Number used to identify elementary subsystem according to functional system name |
| WR | Written Request |
| SE-COS | Construction Department of Slovenske Elektrarne |
| LOT | Construction Units representing an entire system or block lines |
| BOM | Bill of Material |
| FW | Field Weld |
| NDT | Non-Destructive Testing |

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| | |
|-------|---|
| PTFE | Polytetrafluoroethylene |
| QA | Quality Assurance |
| QC | Quality Control |
| WPQTR | Welder and Welding Operator Performance Qualification Test Record |
| WPQR | Welding Procedure Qualification Record |
| WPS | Welding Procedure Specification |
| NCR | Non Conformity Report |
| EFD | Engineering Field Disposition |
| PTS | Purchasing Technical Specification |

Unifying acronyms and terms used in SE-MO34 are prescribe in PNM34082079 THE DATABASE OF TERMS & ACRONYMS [A8]

1.2 TERMS PLANT DESCRIPTION

Mochovce Nuclear Power Plant is situated in the Southwestern region of Slovakia, not far from the district towns of Levice, Nitra and Zlaté Moravce. It is situated at the south of the mountain ranges and plains of Štiavnické vrchy and Pohronská pahorkatina.

According to the original design, the plant consists of 4 units of VVER 440/213. Pressurized water reactors of the Russian design. Units 3 and 4 in the Mochovce nuclear power complex are adjacent to the already operating units 1 and 2 and use the auxiliary systems already built and operable which are common for all 4 units.

A Basic Design relevant to the units 3 and 4 has been developed for SE by the DOSMO consortium. Scope of the current project is the completion of Units 3 and 4 for commercial operation. Each Unit is organized in two main areas: Nuclear Island (NI) and Conventional Island (CI). The Detail Design of Unit3 and Unit 4 is performed by several Contractors, under the coordination of SE.

The languages of the project are Slovak and English. Documentation shall be provided in both languages.

2 SCOPE OF SUPPLY

2.1 DEFINITION OF SCOPE OF SUPPLY

The exact scope of supply will be provided by Client (SE) to contractor through '**Written Request**' on time as it is specified in contractual agreement. The scope of work might include, but is not limited to the following activities:

- a) Pre-fabrication, assembly and erection of all the incomplete items regarding pipelines, valves, supports, equipment and steel structures of the systems detailed in the paragraph 2.2 within the limit of battery specified into the indicated P&ID, by using as input the Detail Design frozen "for Construction" and the related EFDs as per relevant procedure as per List Project Rules [R1].

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- b) Preservation of the handover systems/part of system within the limits indicated in "Written request", till commissioning beginning, according the rules specified in par. 2.6.
- c) Activities requested by Construction department of Client to solve the eventual incomplete items, as a result of Commissioning before Turnover (TO).
- d) Activities requested by Commissioning department of Client in order to solve eventual non-conformities of the system or part of system.
- e) Completion of the ATDs relevant for the Erection stage of the involved systems.
- f) Completion of whole document set belonging to EPSs of previous job M048A (completion of welding book, technological procedures, support drawing for field routed lines etc.).

2.2 SYSTEMS, LOCATION AND BATTERY LIMITS

The activities shall be done inside buildings and underground channels as follows:

- CS 490/1-02 Turbine Hall – Unit 4
- CS 805/1-02 Lengthwise side electrical building – Units 4
- CS 810/1-04 Emergency feed water system – Unit 4

Reference document for identification of areas and buildings is E041200033V [R5]

Environmental conditions within MO3&4 NPP are prescribed in E041200015T [R6]

The technical documentation and consequently the activities are organized in systems (PS) and elementary sub-systems (DPS) as per the definitions provided by Basic Design. This subdivision is used for identification of scope of work and relevant battery limits. P&ID mentioned in the below table are indicating the battery limits of the potential scope of supply.

Table #1 PIDs in SoW

| LOT | DPS | P&ID | ISOMETRIC |
|---|---------|---|--|
| LOT 14. NESW (Cooling Water) system, Hot/Cold Water Distribution System | 4.04.01 | PNM34160613, PNM34160612, PNM34160611, PNM34160610, PNM34160609, PNM34160608, PNM34160607, PNM34160606 | PNM34141365 |
| | 4.05.01 | PNM34160622, PNM34160404 | PNM34141365, PNM34141050 |
| | 4.07.01 | PNM34160622, PNM34160618, PNM34160613, PNM34160612, PNM34160609, PNM34160608, PNM34160607, PNM34160606, PNM34160605, PNM34160604, PNM34160405, PNM34160404, PNM34160403 | PNM34142802, PNM34141365, PNM34141050, PNM34140650 |
| LOT 17: LOT 4: Emergency Feed Water System | 4.05.07 | PNM34160621 | PNM34141361, PNM34141030 |
| | 4.07.01 | PNM34160621, PNM34160620, PNM34160614, PNM34160611, PNM34160610, PNM34160401 | PNM34141361, PNM34141030 |

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|--|---------|---|---|
| Unit 4 | 4.26.03 | PNM34160620 | PNM34141361, PNM34141030 |
| LOT 18: Condensate System Unit 4 | 4.04.01 | PNM34160617, PNM34160616, PNM34160613, PNM34160612, PNM34160611, PNM34160610, PNM34160609, PNM34160608, PNM34160607, PNM34160606, PNM34160605, PNM34160604 | PNM34141366, PNM34141358, PNM34141040, PNM34141038 |
| | 4.07.01 | PNM34160672, PNM34160671, PNM34160638, PNM34160622, PNM34160619, PNM34160618, PNM34160617, PNM34160616, PNM34160615, PNM34160614, PNM34160613, PNM34160612, PNM34160611, PNM34160610, PNM34160609, PNM34160608, PNM34160607, PNM34160606, PNM34160605, PNM34160604, PNM34160404, PNM34160218 | PNM34141397, PNM34141366, PNM34141358, PNM34141040, PNM34141038 |
| | 4.27.02 | PNM34160618 | PNM34141040 |
| LOT 19: Condenser Vacuum System Unit 4 | 4.04.01 | PNM34160605, PNM34160604 | PNM34141396, PNM34141053 |
| | 4.07.01 | PNM34160605, PNM34160604, PNM34160404 | PNM34141396, PNM34141053 |
| LOT 23: Low Pressure Air System Unit 4 | 4.04.01 | PNM34160434, PNM34160221 | PNM34141390, PNM34141045 |
| | 4.07.01 | PNM34160221 | PNM34141390, PNM34141045 |
| LOT 25: High Pressure Air System Unit 4 | 4.07.01 | PNM34160601, PNM34160514, PNM34160221 | PNM34141391, PNM34141070, PNM34141044, PNM34141041 |
| LOT 40 supports of condensate expansion tank | 4.04.01 | | N/A |

2.3 INTERFACES

Interfaces will be treated as following:

- Civil interfaces – Anchoring of pipe support assembly and penetrations shall be realized as per the indications provided in Detail Design and they are included in scope of work.
- Equipment interfaces - Piping will be connected to the relevant equipment respecting the requirements provided by the manufacturer. Connections to existing equipment are in scope of work.
- Tapping points (I&EC) – required tapping points shall be installed as per relevant Isometric drawing and P&ID. Scope of supply is limited to install the tapping points and root valves were required.
- Electrical interfaces – motorized valves and manual valves with electrical signalization will be installed as is. Their electrical connection is not part of the scope of work.

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2.4 GENERAL CONTENT

Original scope of work of Job M48 was divided as per Lots consisting of pipelines belonging to different systems. The same groupment will be maintained for the present PTS as listed in Overall Line List [1]. The following table is the overview of the lots versus corresponding involved DPSs. The table is also indicating the estimated quantity of lines, valves and supports, related to each lot.

Table #2 DPS vs LOTs in SoW

| JOB | LOT | DPS | lines | supports | valves |
|---|---|---------|-------|----------|--------|
| M048B | LOT 14. NESW (Cooling Water) system, Hot/Cold Water Distribution System | 4.04.01 | 364 | 290 | 221 |
| | | 4.05.01 | | | |
| | | 4.07.01 | | | |
| | LOT 17: LOT 4: Emergency Feed Water System Unit 4 | 4.05.07 | 158 | 346 | 219 |
| | | 4.07.01 | | | |
| | | 4.26.03 | | | |
| | LOT 18: Condensate System Unit 4 | 4.04.01 | 1155 | 2162 | 1051 |
| | | 4.07.01 | | | |
| | | 4.27.02 | | | |
| | LOT 19: Condenser Vacuum System Unit 4 | 4.04.01 | 70 | 72 | 74 |
| | | 4.07.01 | | | |
| | LOT 23: Low Pressure Air System Unit 4 | 4.04.01 | 159 | 173 | 155 |
| | | 4.07.01 | | | |
| LOT 25: High Pressure Air System Unit 4 | 4.07.01 | 50 | 14 | 27 | |

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Proper text of the "Completion Certificate" will be defined at contractual level.

FINAL DELIVERY AND HANDOVER DOCUMENTATION

Final Delivery Date is defined at contractual level. The Contractor shall complete the activities in all respects and Handover Back to Client before the Final Delivery Date. The Final Delivery Date means the date that Client accepted the "Certificate of Completion" of all Lots.

PRECONTRACTUAL DEVIATIONS

No deviations/exceptions from this specification shall be permitted without approved revision of the same PTS.

A complete list of exclusions/deviations from the Contractor's scope of work shall be clearly indicated in the relevant Technical/Commercial Offer.

Similarly, if any departure, omission or substitution from the stipulated specifications is made, this fact should be clearly indicated and motivated in the relevant Technical/Commercial Offer.

Any additional material/activities that Contractor considers essential to include in the Technical/Commercial Offer and which is not specifically mentioned in the PTS, shall be included in the relevant Technical/Commercial Offer.

Prior of contract issuing, the present PTS will be revised including each one of the above mentioned typology of deviation (if any).

VALORIZATION METHOD

Pre-fabrication, assembly, erection, preservation, activities will be on item rate contract basis.

2.5 WORK PROCESS DESCRIPTION

Once Contract awarded the following workflow shall be respected:

INPUT DATA

As per Handover described in par. 2.4 Client will provide to Contractor the exact scope of supply specified in 'Written Request. In addition Client will pass to the Contractor the following documents:

- Isometric collections, valves collections, piping supports collections, P&IDs listed in Written Request (WR) provided by
- NCRs, DDMs, and EFDs not closed and relevant for the SoW of the present PTS
- Documentation relevant for erection (logbooks, minor change registers, etc.)
- Technical book for mechanical erection CI [A6]

Contractor shall verify and ensure that all documents received from Client are complete and consistent in order to carry out the scope of work of the present PTS. Contractor will accept the documental set within 10 working days. In case of the Contractor find out some inconsistencies/incompleteness, shall rise relevant NCR as per procedure PNM34080055 listed in List Project Rules[R1].Client will solve the NCR through its

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Engineering department. During NCR solution, terms of delivery will be frozen exclusively for the portion relevant for the NCR.

All relevant documentation shall be transmitted by Client to Contractor following the rules stated in PNM34080144 par. 4.4.

SCHEDULE OF ACTIVITY

Contractor shall prepare Schedule of Activity and estimated Unit Rates evaluation in respect of each individual "Written Request" (WR) within 15 working days after signing contract. The document shall be prepared considering each working group not interfering to each other as it will specified by "Written Request".

Each line of the schedule of activities shall include, at a minimum, the following elements:

- Undividable portion of activity – (single Work Request as par. 2.5.4)
- Belonging of activity (Lot, PS, DPS)
- Duration estimated
- Dependencies (e.g. materials/components availability – interference with other Contractors, etc)
- Critical Path
- Resources adopted (as per Price Breakdown List par. 2.4.7)
- Timeline

Schedule of Activity document shall be submitted to Planning Department of Client for for verification and approval.

WORK REQUEST ACTIVATION MECHANISM

Contractor will be activated for each undividable portion of activity through Work Request issued by Client.

In case of deviation from the original scheduled sequences and/or from original scope, it shall be clearly stated in Work Request. The Construction department of Client is empowered to issue additional Work Request only in order to cover eventual corrective actions caused by NCRs.

FULFILLMENT OF A WORK REQUEST

Contractor once completed a "Work Request" (WR) will inform Construction department through "Contract Notice". Subsequently, Construction department of Client will provide to carry out the following steps:

- Inform QC/QS in order to get them approval on correct completion of the Work Request.
- Once fulfilment of Work Request will be approved, Planning will be informed by Construction Department in order to get the general planning updated

Construction department of Client will approve the Work Request completeness only after:

- No objection from QC/QS
- Real fulfillment of solutions for relevant NCRs are achieved.

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MONITORING ACTIVITY

Contractor shall allowed Construction and Quality departments of the Client to monitor the progress of activity, by holding meeting/workshop on weekly basis, site survey, field inspections and audits on the ongoing activities including documental portion.

Contractor will provide Progress Report on weekly basis where following items shall be highlighted:

- Progress performed in comparison with defined schedule
- Issued documents
- Critical points
- Raccmandations

Client (whichever department) as result of the monitoring activities shall rise relevant NCR in case of any deviation detected.

CORRECTIVE ACTION

In case of deviations of not fulfillemnt of whichever aspect occurred during Work Order execution, relevant NCR shall be issued by Contractor. Construction department of Client will be immediately informed and NCR transmitted to Engineering Department for its solution.

LOT COMPLETION

Once all the Work Requests belonging to the same Lot will be completed and approved, Contractor will issue the "Certification of Completion as per paragraph 2.4.3. Certification of Completion will include list of each NCR processed along the entire Lot.

2.6 DETAILED TECHNICAL REQUIREMENTS

Achieve erection completion of systems - Unit 4 shall be as per the methods described in the original JOB M48B - TECHNICAL BOOK FOR MECHANICAL WORKS PNM34142877 [A6] considering to derogation as per chap. 2.2. **The exact scope of works will be defined through "Written Request (WR)" provided by SE.**

In case of discrepancies between this specification and the earlier PNM34142877 and the other referenced documentation, this PTS and documents provided by SE-COS overrides the others.

Works shall to be referred along with all subsequent amendments, NCRs/EFDs, BDA and detailed design developments till present date.

The Contractor has to complete and deliver all systems or part of system listed in Written Request (WR) to Client, in line with the project rules listed in the attachments and reference documentation as in chap. 13 and 14.

Supplier shall consider that BDA (Basic Design Amendment) prevails over the Basic Design.

From the point of view of nuclear safety, the classification pursuant to Decree 430/2011 as follows (as identified in PNM34140368 *Overall Line List#* par. 14 Annex [A]):

- **SAFETY CLASS II/III**: according to Decree 430/2011
- **SEISMIC CLASS 1b**: Seismic resistance for preservation of full functionality is required up to the level of maximum design earthquake (SL-2) inclusive.

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- **SEISMIC CLASS 2a:** only verification of type design (general concept and conditions of seismic anchorage) of stability and anchorage of equipment is required.

Supplier shall comply with "Rules for Construction of Nuclear Facility Components – ASME Div.1 section III subsection ND 4000".

Supplier shall consider and implement site-specific rules of Slovak Republic and regulations of the licensing authority (ÚJD – Slovak Nuclear Authority) and the additional technical requirements mandated by nuclear codes and standards, based on the safety-related importance of each component.

Requirement stated in Slovak laws and ÚJD decrees shall prevail over other standards mentioned in the present document.

It is supplier's duty and responsibility to issue the documentation, perform works and tests in order to comply with Slovak Laws, National Standards and requirements of ÚJD.

The following laws, regulations and technical standards apply:

- ÚJD SR BNS II.3.3/2011 Metallurgical products and spare parts for Nuclear Power Plants
- ÚJD SR BNS II.5.1/2012 Welding of nuclear equipment, Principal requirements and rules
- ÚJD SR BNS II.5.2/2012 Inspection of welding and quality of welded joints of machine and technological components of WWER 440 nuclear power plants, Requirements
- ÚJD SR BNS II.5.3/2011 Filler materials for welding of machine and technological components of nuclear installations, Technical requirements and selection rules
- STN EN 10204/2005 Inspection certificates.

Any material and/or service, even not specifically mentioned in this specification or into relevant attachments, that are usually included in similar manufacturing and supply that are necessary to complete the works in accordance with all applicable laws, codes standards regulations and requirements, has to be considered included in the Supplier scope of work.

DOCUMENTATION RECORDS AND ACTIVITIES

All documents cited hereunder shall be submitted to the Client for his review and/or approval.

1. Documents to be prepared before commencement of pipe work. The documents shall include but not limited to the following:

a. Quality plan

The quality plan shall include details and the sequence of all examinations that will be performed for control of the Executor's work. The names of the individuals responsible for the implementation of all quality assurance (QA) and quality control (QC) functions shall also be included.

b. Recording system

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The Contractor shall establish and maintain documented procedures for identification, collection, indexing, access filing, storage, maintenance and disposition of the quality record.

c. Procedures

The procedures shall include but not limited to the following:

- material take over, handling and storage;
- material and consumable material control;
- welding;
- N.D.T.
- mechanical working;
- heat treatment;
- mechanical cleaning;
- chemical cleaning;
- priming and painting activities;
- pressure testing;
- Pre-commissioning and commissioning.

d. Other documents

- i) welding procedure specification (WPS), welding procedure qualification record (WPQR) and welder and welding operator performance qualification test record (WPQTR), welding book;
- ii) work program.

2. Documentations to be prepared during execution of pipe work

The Contractor shall maintain the following records:

- a. Material and consumable material control;
- b. Marked up isometric drawings;
- c. Visual and dimensional inspection report;
- d. N.D.T. reports;
- e. Post weld heat treatment reports;
- f. Non conformity reports;
- g. Pressure test reports;
- h. Any agreed deviation from job specification.

3. Documents to be prepared after completion of pipe work:

- a. as constructed drawings,
- b. certificate of compliance with job specification.

On completion of pipe work all ATD/QA documents mentioned in this specification shall be submitted to the Client for approval.

HANDLING AND STORAGE ACTIVITIES

Procedures for off-loading, storage, receiving, control, traceability and inspection of piping material supplied for fabrication and installation shall be worked out. In general, the following applies:

- storage of piping and piping equipment shall be under cover and protected against contact with the ground on elevated tonnage and protected against contact with salts or salty water.
- carbon steel and stainless steel components shall be segregated to avoid any cross contamination.

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- all fittings and equipment shall be protected against damage during handling from client to fabrication yard and further to final installation plant. Especially focus shall be made to sealing surfaces, beveled areas, and contact between different material qualities to avoid surface contamination. This also includes protection during erection phase in order to protect against contamination from other activities on site.

PROTECTION OF THE INSTALLED SYSTEMS

Take care and of all the equipment's already installed at site shall be in Contractor scope respecting the following:

- All in/outlets shall be plugged/blanked. Flanges shall be blanked with oil resistant rubber gaskets and steel or water resistant plywood plate with galvanised bolts sufficient to provide mechanical protection and water/dust tight sealing, heavy plastic cap sealed and fixed is acceptable.
- All threaded openings shall be provided with steel caps or solid-shank steel plugs of metallurgy equal to the metallurgy of the component being capped or plugged. In no case shall non-metallic (for example, plastic) plugs be used.
- All openings that have been bevelled for welding shall be provided with closure designed to prevent entrance of foreign materials and damage to the bevel.
- Other types of equipment as instruments shall be protected with aluminium sheeted glass fibre cloth, min. 0.3 kg/m² or equal, and sealed.

The above rules refer to temporary take care only. Necessary periodical survey to be carried out as per preservation maintenance check lists regulating quality assurance for nuclear installations (Act No. 541/2004 Coll. and Regulation of UJD SR No. 431/2011 Coll. [3]) is out of scope of this PTS.

SUPPLY ACTIVITIES

Contractor is required to supply:

- all needed temporary components to perform piping hydro test activities;
- Special tools for maintenance (if required);

All material components supplied have to be approved for using in MO34 in accordance with document "Management of Chemicals for construction 3 & 4" - MO34/MNA-190.03 - PNM34080067 Ref. [1].

The material is furnished by Client with the exclusion of:

- Gaskets;
- bolts and nuts;
- temporary items (eg. strainers using during flushing program);
- Supply and installation of anchoring plates and anchor bolts

The supply of the items above is in scope of work of Contractor. All items shall be provided per specification included in Detail Design. Should any info be required, contractor shall address request for clarification to SE Engineering.

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Activities outside the scope of supply are:

- Fluid identification bands, labelling and tagging (will be a part of other contract);
- Thermal insulation (including earthing).

PREFABRICATION AND ERECTION ACTIVITIES

All relevant activities to this technical specification are listed as follow:

- Erection works of items specify in *List of pipelines and components, supports, equipment to be executed* (Annex 7 SoW of Mechanical Erection Works- U4 (M48B));
- General Technical Conditions for Assembly Welding of Classified Equipment PNM34088036 and its supplementary instructions
- Pickling and sandblasting according technical book for mechanical erection CI [A6]
- Pressure tests activities as per PNM34142877 [A6];
- Storing the materials up to completion of the scope of works;
- Scaffolding and areas confinement as per chapter 11 Project Rules;
- Test and Inspections Plan as prescribed in chap. 3.4.1;

During the execution of the Works, the Owner reserves the right to enlarge the scope for additional works which are not included in this document.

Detailed description of activities on LOT basis previously belonging to Job No. M48B:

Erection of piping, supports and components.

The activities required in the scope of work are:

- Supply, erection and dismantling of scaffolding.
- Materials handling operations. From Owner storage areas or warehouse;
- Prefabrication (if necessary) and erection for small bore piping (up to DN50)
- Erection of already prefabricated pipelines Large Bore (size over DN50). Is also included the prefabrication works for completion of missing parts;
- Supply and installation of anchoring plates and anchor bolts;
- Erection of supports;
- Erection of any accessories for pipelines supplied by Owner (Valves, expansion joints, steam traps, filters, nozzles, orifices, regulating valves, safety valves, instrumentation, flow indicators, primary supports, etc.);
- Material supply and erection of gaskets, bolts and nuts (including Certificate EN 10204_3.1) and temporary pumps suction strainers;
- Anticorrosive painting primer and painting touch-up as per technical books [A6];
- Welding and relevant associated activities (cut, ends preparation, pre/post heat treatment, etc.), non-destructive test.
- Hydraulic test.

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OTHER VARIOUS ACTIVITIES

During the work Client may require to the Contractor to perform the following activities:

INSERT PADDING AND ANCHORING

The Supplier shall perform the casting of expansive mortar both for the definitive fixing of the bolts of anchorage of the equipment and for the padding between metallic plates and plinth.

DEMOLITION

The activity shall include the demolition of piping, steel structures, equipment and minor civil work.

DISMANTLING

The activity shall include the dismantling of piping, steel structures and equipment.

CUTTING, WELDING AND BEVELLING WORKS REQUESTED BY CLIENT:

Cuts, bevelling and welds on metal pipelines for the various systems existing on the plant at any elevation. The aforesaid work shall include paint restoration (touch-up).

MISCELLANEOUS ACTIVITIES

Execute on metallic pipelines associated with the various existing systems, non-destructive tests such as radio/gammagraphs testing, magnetoscopic test, thickness measurement on elbow intradoss and extradoss, liquid penetrant or ultrasonic test. For the execution of the aforesaid works, paint restorations are included (touch-up).

In case of performing the various minor activities and/or miscellaneous activities within the relevant Lot such performed activities become an integral part of the Lot.

3.0 QUALITY ASSURANCE AND QUALITY CONTROL REQUIREMENTS

3.1 QUALITY MANAGEMENT SYSTEM

The Provider shall assure the implementation of a Quality Management System (QMS) in his own organization in compliance with ISO 9001:2008 Standard Quality Management System – Requirements and meeting the requirements set in this chapter. In addition to that Provider shall meet within the Services applicable requirements of PNM34080002 MO34 Reference Quality Assurance Program.

The Provider shall provide evidence to Owner on the suitable implementation of required QMS.

For works to be subcontracted, the Provider shall select the suitable and applicable QMS requirements including those set forth in this paragraph. The Provider shall request and verify the implementation of selected QMS requirements by its Sub-providers chosen among those who can ensure the fulfilment of such requirements.

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For works to be subcontracted, the Provider in his Proposal for specific works shall submit to the Owner a list of intended Sub-providers if any. The Owner reserves the right to approve or refuse any of proposed Sub-providers.

3.2 QMS DOCUMENTATION

The Provider shall prepare and submit to Owner Quality Plan describing the application of its own QMS for his scope of the Services in compliance with PNM 34080056 Elaboration of Supply Quality Plan (SQP).

Requirements of SQP shall be transferred to the sub-providers of the Provider, including approval of their SQP. The provider shall keep the records regarding Project rules hand over to sub provider's level.

The Provider shall submit SQP to the Owner for approval within two (2) month after signature of the Contract but at latest before launching of the Services. SQPs of Sub-providers shall be submitted by Provider to the Owner for review. SQPs of Sub-providers shall be approved by Provider.

When realizing the Services Provider shall follow then Project Rules prepared by Owner to cover and clarify the coordination, communication, responsibilities and procedures in areas where mutual understanding needs to be achieved. The project rules are listed in respective annex of PTS.

The Provider shall develop appropriate procedures for management of supply. The Owner reserves his right to review and comment on specified project procedures at any phase of the project.

SQP and the Sub-providers' SQPs shall be controlled and updated, as necessary, to assure their continuing suitability and adequacy. Any change shall be clearly identified and described. All changes of SQP shall be approved by Owner and Provider shall approve changes of Sub-provider's SQPs. SQPs of Provider and Sub-providers shall be planned in Engineering Plan and Schedule (EPS) of the Owner.

The Owner reserves the Right to review and approve following procedures of Provider's QMS applied on the Services:

- Management of documentation and reports
- Management of nonconformities

The Provider shall have functional and certified QMS for execution of the Services complying with requirements of EN ISO 9001:2008 proved by:

- Quality Manual; and
- Certificate; and
- Supply Quality Plan

The Provider undertakes to keep all documents relating to activities with impact on quality for the whole contract term in a way to prevent their damage, loss or destruction. Documents not handed over to the Owner shall be archived for 10 years after completion of delivery. The Provider shall offer such documents to the Owner prior to their discarding.

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3.3 QMS SURVEILLANCE

The Owner reserves the right to audit implementation of the QMS of Provider and, where necessary, of its Sub-providers, through QMS audits or process audits at their premises their own organization and/or on MO34 site, and involving all documents relevant to the implementation of Services.

The Owner shall proceed to notify the Provider of deficiencies pointed out, if any by the relevant report notify to Provider identified nonconformities and areas for improvement, and to require implementation of appropriate corrective actions.

The Provider and its Sub-providers shall enable Regulatory Authorities Inspectors to perform inspections and audits at all its premises.

The Provider shall be responsible for the supervision and monitoring (through quality audits and other surveillance activities) on the work performed by its Sub-providers, to ensure that they comply with their own SQPs and with the Contract requirements. Upon request the Provider shall allow the Owner to participate at Sub-providers' quality audits.

The Provider shall, at Owner's request, arrange an unplanned audit at specified Sub-provider. This audit shall be held by Provider or by Owner with Provider participation. The Provider shall ensure the completion and realization of corrective actions for non-conformities, which shall be raised during the unplanned audit performance.

The Provider shall evaluate and select his Sub-providers based on their ability to meet requirements resulting from the Contract with the Owner. These contractual requirements shall be reflected in Contract with his Sub-providers including request for Sub-provider's QMS to be checked by the Provider at execution of Services once during the term of the contract, but minimally once in two years during of the project of completion of NPP Mochovce units 3 and 4. The Owner reserves his right to participate or to directly perform audit at the Sub-provider with the participation of the Provider.

The Provider shall plan and perform internal audits pursuant to EN ISO 9001:2008 and EN ISO 19011:2011 aimed at verification of compliance between activities in the field of quality assurance and their results, and planned requirements. He shall verify and assess efficiency of his QMS. Internal audits shall be performed by employees with relevant qualification.

Provider shall manage product nonconformities and on monthly base submit actual situation of product nonconformities solving together with appropriate supporting documentation in accordance with Project rule PNM34080055 Control of product`s nonconformities.

3.4 QC REQUIREMENTS

3.4.1 ITP & ITP REPORTS

The Provider for all inspection activities shall observe the procedure PNM34082337 - Management of ASSIK Software Application, Inspection and Test Plans and Inspection and test reports for Project MO34.

The Provider shall prepare suitable Inspection and test Plans (ITP) including their detailed description, which cover all Inspections and tests which comes from design documentation, legislation, Individual Quality Assurance Programs (for existing classified equipment if applicable), Classified Equipment Quality Plans for classified equipment (for

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new classified equipment), existing Technical Conditions , applicable technical standards, etc. including inspections and tests carried out both on manufacturing activities and on site construction and erection activities needed to assure fulfilment of applicable requirements, unless otherwise agreed with Owner. In such case Incoming inspection shall be planned and performed upon presence of the Owner's representatives.

The Owner reserves the right to appoint Hold points and Witness points in the ITPs in of Providers and Sub providers, as well as specification of inspection points of NRA supervision (ÚJD SR). ITP prepared by Provider shall be delivered to the Owner for approval via CSMS for comments and specification Witness and Hold points specification.

The Provider shall prepare ITP for erection via software application ASSIK MO34 before transmittal of ITP for approval to the Owner via Extranet.

The Provider shall send data form of ITP created in software application ASSIK MO34 to the Owner.

The Provider shall send to the Owner for comments and approval ITPs in terms defined in the Engineering plan and schedule (EPS). The form for developing ITP is specified in PNM34082337 - Management of ASSIK Software Application, Inspection and Test Plans and Inspection and test reports for Project MO34.

The Provider shall prepare ITPs on the forms, which are part of the software application ASSIK MO34.

The Provider shall prepare ITP reports for erection on the basis of agreed uniform form specified in in application ASSIK MO34.

The Provider shall hand over continuously electronic form of the ITP reports and PDF forms to the Owner within 30 calendar days from the completion of the test.

The Provider shall send to the Owner the status report on realization of inspections and tests in monthly intervals in electronic format specified by the Owner.

The Provider's inspections performance shall be done by independent staff, that means different from those performing or directly managing contractual performance being subject of inspections and tests.

The Provider shall notify the Owner 3 days before the date of its performance on site for inspection determined by the Owner as Hold points and Witness points.

The Provider shall notify Owner for conformity check based on Atomic act No.541/2004 Coll. In compliance with Project rule PNM34080525.

3.4.2 ATD

The Provider for all activities related to Accompanying Technical Documentation (ATD) shall observe the procedure PNM34080296 - Manual about structure and scope of accompanying technical documentation.

The Provider shall prepare the database of accompanying technical documentation (construction/erection dossier) according to valid Slovak legislation, design documentation and applicable standards to be handed over to the Owner during the phase of supplies take over. The database of ATD is defined in procedure PNM34080296. The Provider shall maintain and update this database of documentation according to change of input data continuously. The database as PNM document will be included in Provider's Engineering and project Schedule (EPS). Activities connected with

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preparation and following approval of ATD are described in procedure PNM34080296 - Manual about structure and scope of accompanying technical documentation.

The provider shall prepare the accompanying documentation (construction/erection dossier) to be handed over to Owner. This dossier shall comply with all requirements specified on accompanying documentation according to valid Slovak legislation, design documentation and applicable standards. The requirements of procedure PNM34080296 shall be met when elaborating and submitting ATD.

For classified equipment, selected equipment and determined equipment shall be all records (technical solution, drawing and documentation linked to non-conformity) attached to the respective part of the accompanying technical documentation.

The provider shall submit the package of accompanying technical documentation after the completion of erection stage to the Owner for verification purposes in hard copy.

After the successful verification shall the Provider hand over the electronic version for uploading into Owner application for documentation commenting to Owner Documents management center within 30 calendar days from the time of hard copy verification.

3.4.3 WELDING ACTIVITIES

The Provider shall observe General Technical Conditions for Assembly Welding of Classified Equipment, PNM34088036 and its supplementary instructions

3.4.4 MONITORING AND MEASURING DEVICES

The Provider shall define suitable and consistent processes and methods for the inspections, measurements and checks to be carried out during manufacturing, erection, construction and commissioning phases for the verification and validation of products conformity included into their Scope of Works.

In order to assure the suitability of measurement outputs, Provider shall confirm that the devices used are fit for the measurements and checks to be carried out, have a suitable accuracy and are properly calibrated.

Calibration of devices shall be carried out against measurement standards traceable to national or international reference measurement standards.

In order to point out the above traceability, Provider is requested to record on the Inspections and Tests Reports the following data:

- Reference data of used devices (Identification Number, type, accuracy, range)
- Identification Number of calibration reports
- Inspection or Test Procedure

In the calibration reports, in addition to the identification data of measurement standards used for the calibration (Identification Number, type, accuracy class, range), it also shall be recorded the identification of national or international standards as reference of the measurement chain. The above registration can be omitted if the calibration has been carried out by an accredited laboratory; in this case the accreditation logo shall be printed on the calibration report.

The calibration reports shall be inserted into the Manufacturing (accompanying technical documentation), in a dedicated section.

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The Provider is requested to transfer the above requirements to its sub-suppliers and sub providers involved in the implementation of the Scope of Works

3.5 DOCUMENTATION

All documents shall be written in English language and, when required, in Slovak language too (for instance, Documents for end user and for Slovak authority supervision and/or approval).

Client release of Contractor's documents will not relieve the Contractor from any technical responsibility or any other responsibility that rises in the design and construction from mistakes, omissions, etc.

All deliverables shall include all references to design, construction, performance verification Standards, Codes, etc.

Submission of documents required but limited to follow: Ref. [1]- PNM34080144 and Ref. [1] -PNM34082012.

Typica EPS

| DOCUMENT TITLE | SENDING PURPOSE | DELIVERY TIME FROM CONTRACT AWARD DATE | DELIVERY WITH OFFER |
|---|-----------------|--|---------------------|
| PROGRAMMATIC DOCUMENTS | | | |
| Engineering Program and Schedule EPS | A | Note b) | Y |
| Integrated Safety Plan (as per Slovak laws) | A | Note b) | Y |
| Sub-suppliers List/Plan and program | A | Note b) | Y |
| Welders List | A | Note b) | Y |
| NTD operators List | A | Note b) | Y |
| Schedule for erection | A | Note a) | Y |
| Schedule of workshop and at site test and inspections | A | Note a) | Y |
| Inventory Report | A | Note b) | Y |
| Statement of compliance with applicable document, or a list of Deviations /Exceptions/ Clarifications | A | Note b) | Y |
| QUALITY SYSTEM DOCUMENTS | | | |

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|---|---|---------|---|
| Quality Assurance Plan | A | Note b) | Y |
| ITP (Inspection and Test Plan) in workshop and for site erection | A | Note a) | N |
| ITP prefabrication | A | Note a) | N |
| ATD database | A | Note b) | N |
| Accompanying Technical Documentation (ATD) | A | Note a) | N |
| Certificates of type tests or special tests already carried out (if any) | A | Note a) | N |
| Pre-assembly proposal (if any) | A | Note b) | N |
| TECHNICAL DOCUMENTS | | | |
| Technical Procedure for Erection | A | Note b) | N |
| Method statements (Technological Procedure) for erection of steel structures, on ground preassembly (if any), tolerance check during construction, bolt tightening, final touch-up, finishing erection and completion | A | Note b) | N |
| Technical report on manufacturing process and facilities (if any) | A | Note b) | N |
| Welding book for prefabrication/erection | A | Note b) | N |
| Management Procedure for welding electrodes | A | Note b) | N |
| Assesment material | A | Note b) | N |
| NDE Procedure | A | Note b) | N |
| Post Weld Heat Treatment (PWHT) Procedure | A | Note b) | N |
| Procedure of Material incoming identification | A | Note b) | N |
| Cutting and Marking Procedure | A | Note b) | N |
| Painting Procedure (related to SoW) | A | Note b) | N |
| Piping anti-corrosion treatment repairs procedure | A | Note b) | N |

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|--|---|---------|---|
| Procedure of Pressure Test | A | Note b) | N |
| Welding repairing procedure | A | Note b) | N |
| Technical procedure for prefabrication and erection of temporary pipes for flushing | A | Note b) | N |
| Technological Procedure for scaffolding | A | Note b) | N |
| DESIGN DOCUMENTS | | | |
| Erection drawings | A | Note a) | N |
| Mark-up of non conformities on shop drawings. | A | Note a) | N |
| Dossier of documentation to get authority approval – as and if required by Authorities | A | Note a) | N |
| Piping support Collection lines DN<65 | A | Note a) | N |

Notes

- a) Documentation to be made available to SE upon design completion.
- b) Documentation to be consigned to Customer at least 10 days in advance of the starting of activities referred to therein.

Clarifications

The above reported Customer EPS shall be the contractual reference and the basis on which the Supplier shall develop its own detailed EPS, after order award.

The required delivery times shall in any case comply with the job time schedule defined in contract documentation.

I/O List documentation shall be developed on the base of indication and proper document format that shall be provided by Customer before starting of the relevant supply activities.

Document Scope

A – For Approval: each document with high impact on the overall plant design and on which is necessary the approval of Customer before the manufacturing beginning

The scope of works includes the activities referred to component Nuclear Safety and seismic Classified. For each classified component (pipeline, supports, equipment, in line components) or group of components, it's requested to issue the relevant certificate dossier as required by Slovak Nuclear Laws.

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4 GUARANTEES AND CONTRACTOR RESPONSIBILITY

4.1 SUPPLY GUARANTEES

Preparation and application of erection activities as described in chap.2.2 compliance to the data and the requirements of this specification (with relevant attachments) must be guaranteed.

Conformity will be verified by means of functional tests.

4.2 CONTRACTOR RESPONSIBILITY

The Contractor shall comply with all the requirements set forth in this specification and its related documents. Approval of drawings, specifications, procedures or test by the Purchaser shall in no way relieve the Contractor from these responsibilities. There shall be no deviations from this specification or its references without prior written approval from the Purchaser. Nothing in this specification shall relieve the Contractor of the responsibility for performing, in addition to the requirements of this specification, such analyses, tests, inspections and other activities which the Contractor considers necessary to ensure that the design, materials and workmanship are satisfactory for the service intended, or as are required by common usage, good practice or by applicable codes.

4.3 CONTRACTOR EXPERIENCE

The Contractor and its personnel shall have adequate experience in piping and mechanical installation works. This includes but it is not comprehensive:

- Pipes and supports,
- Vacuum systems installation,
- Installation of sensitive components within a very tight tolerance,
- All kind of in-line components,
- All kind of mechanical equipment for plants.

The Contractor shall demonstrate to have adequate experience in installation of equipment in compliance with:

- ASME III,
- ASME B31.1,
- European Directive 97/23/EC and in the Directive 2006/42/EC relative to pressure equipment.

In addition, it is required to have experience in:

- International projects, i.e. customer(s) and/or Contractor(s) from different countries, with all documentation being delivered in English,
- Construction sites with high occupational safety standards.

5 INSPECTIONS AND TESTS

The Contractor shall carry out all inspections and tests necessary to verify that the materials and services fulfil all the contract requirements. These inspections and tests

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shall include both those defined by the Contractor manufacturing and erection standards, and those required by the applicable codes and standards as defined in chap 3.4.1.

Pressure testing of all piping, components, tubing in connection with piping and equipment (whenever it is possible) for all systems of CI of NPP Mochovce Unit 3 and 4 as required by applicable codes, Slovak Laws, standards and engineering requirements is provided in the document in para 60 of document:

PNM34142877 JOB M48B - TECHNICAL BOOK FOR MECHANICAL WORKS Ref. Annex [6]

PNM34088036 General Technical Conditions for Assembly Welding of Classified Equipment

The procedure of Test and Inspection shall be written by contractor and subject to approval of Quality and Construction Department)

The Contractor shall prepare appropriate documentation indicating the kind and extent of inspections and tests to be carried out on site, and commissioning, ITPs according par.3 DOCUMENTATION. These shall be submitted to Client and shall be enclosed in the offer as described in chapter 4.

The inspections and tests will be witnessed by Client and his Customer, or their representatives. Client and his Customer will select inspections and tests to be considered witness or hold points, on the basis of documentation.

Client reserves the right to require any additional inspection or test and to increase their extension prior the contract award, in order to fulfil his Customer requirements.

Certification shall be available for inspection by Client before shipment and handover to warehouse. Copy of certification shall be sent along with material.

6 PERFORMANCE GUARANTIES

Technical responsibility will be attributed to the Provider for the content and the correctness of the services provided.

7 PENALTIES

Delay of Contractor with completion of Schedule Milestone described in Schedule, shall be applied Penalty in accordance with Contract stipulations.

8 MODE OF DELIVERY

Mode of delivery of documentation is explained in chap. 3.1 and documents in attach. [G8]. All documents shall be provided both in English and Slovak language and shall be stamped by engineer registered to the Slovak chamber of civil engineers or hosting engineers.

All the documentation shall be elaborated by engineer with proven experience in the nuclear field. All the documents are to be provided both in source and pdf files. Documentation shall be submitted according to procedure PNM34080144 Ref. [1].

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Submitted documentation will be checked by SE and approved by SE using the official commenting process (CSMS). The outcome of the SE approval (Comment sheet) will be sent to Provider via official transmittal.

9 SCHEDULE

In accordance with Contract stipulations

10 PRICE BREAKDOWN

In accordance with Contract stipulations.

11 PROGRESS MEASUREMENT AND PAYMENTS

In accordance with Contract stipulation

12 REFERENCE DOCUMENTS

| Sequence No. | Identification No. | Document name |
|--------------|--------------------|--|
| [R1] | | List of Project Rules |
| [R2] | PNM34085438 | EFD – Engineering Field Disposition |
| [R3] | PNM34480826 | Design Freeze Instruction |
| [R4] | PNM34080076 | Expediting activities |
| [R5] | E041200033V_R02PO | General MO34 Layout |
| [R6] | E041200015T | Environmental Characteristic |
| [R7] | PNM34080002 | REFERENCE QUALITY ASSURANCE PROGRAMME FOR UNITS 3 AND 4 IN MOCHOVCE NP |
| [R8] | PNM34080003 | SE-MO34 STAGE QUALITY ASSURANCE PROGRAMME FOR THE CONSTRUCTION AND COMMISSIONING |
| [R9] | | SE - Code of Ethics |
| [R10] | PNM34080144 | GENERAL RULES FOR CONTRACTORS FOR DOCUMENT SUBMISSION TO SE AND ENGINEERING PLAN & SCHEDULE PREPARATION# |

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|-------|-------------|---|
| [R11] | PNM34060089 | CONSTRUCTION ORGANISATION PLAN |
| [R12] | | NR SR Law No. 541/2004 Coll. „Atomic Law“ |
| [R13] | | ÚJD SR Decree No. 431/2011 Coll. |
| [R14] | PNM34082012 | Standard EPS for Contract Preparation |

13 LIST OF ANNEXES

| Sequence No. | Identification No. | Document name |
|--------------|--------------------|--|
| [A1] | PNM34140368 | Overall Line List# |
| [A2] | PNM34140300 | Overall Equipment List# |
| [A3] | PNM34140691 | Overall Support List# |
| [A4] | PNM34161601 | Fluid List# |
| [A6] | PNM34142877 | JOB M48B- TECHNICAL BOOK FOR MECHANICAL WORKS |
| [A7] | | SoW of Mechanical Erection Works-Item List-U4 (M48B) |
| [A8] | PNM34082079 | THE DATABASE OF TERMS & ACRONYMS |
| [A11] | PNM34480459 | TURNOVER OF SYSTEMS TO COMMISSIONING |

