 javys jadrová vyrad'ovacia spoločnosť	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 Contract
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CONTRACT

ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1

CONTRACT N° : BIDSF 010 5 001

between

Jadrová a vyrad'ovacia spoločnosť, a.s.

and

VF, a.s.


Dated: _____

 <p>javys jadrová výstavba spoločnosť</p>	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 The Contract Agreement
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BIDSF project C7-A3

**ERECTION OF THE NEW LARGE CAPACITY
F&D FACILITY NPP V1**

A. The Contract Agreement

	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 The Contract Agreement
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CONTRACT AGREEMENT

This Agreement made on the _____ day of _____ 2011

Between, **Jadrová a vyrad'ovacia spoločnosť, a.s.** a state owned joint stock company duly organized and existing under the Laws of the Slovak Republic with its registered office located at Tomášikova 22, 821 02 Bratislava, Slovak Republic and registered with the Trade Register of the District court Bratislava I in section Sa under number 4649/B, Company Identification No.: 35 946 024, duly represented by Mr. Ján Horváth – Chairman of the Board of Directors and Mr. Miroslav Obert – Vice-Chairman of the Board of Directors, entrusted with the relevant powers in compliance with the Statute of Jadrová a vyrad'ovacia spoločnosť, a.s. (hereinafter called "the Employer") of the one part,

and

VF, a.s., a joint stock company, duly organized and existing under the Laws of Czech republic with its registered office located at náměstí Míru 50, 679 21 Černá Hora, Czech republic and registered with the Commercial Register of the Regional court in Brno, entry number 2681, Company Identification No.: 255 32 219, duly represented by Mr. Jiří Malysák – Vice-chairman of the Board, entrusted with the relevant powers in compliance with the Statute of VF, a.s. (hereinafter called "the Contractor") of the other part.

Whereas the Employer desires that the Works known as "Erection of the New Large Capacity F&D Facility NPP V1" should be executed by the Contractor, and has accepted a Tender by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, for the purpose of interpretation, the priority of the documents shall be in accordance with the following sequence:
 - A. This Contract Agreement
 - B. The Letter of Acceptance
 - C. The Letter of Tender
 - D. The Conditions of Particular Application
 - E. The Appendix to Tender
 - F. The General Conditions
 - G. Clarification questions and answers
 - H. The Employer's Requirements constituted by:
 - H1. Technical Specifications
 - H2. Schedule of works
 - H3. Drawings and other Documentation
 - H4. QA and QC surveillance requirements
 - H5. Safety and Technical Conditions

	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 The Contract Agreement
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- I. The Contractor's Proposal constituted by:
 - I1. Technical proposal
 - I2. Project organization and Time schedule
 - I3. Price Schedules
 - I4. List of spare parts
 - I5. List of Subcontractors
 - I6. Manufacturer 's Authorisation form
- J. Performance Security

- 3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to design, execute and complete the Works and remedy any defects therein, in conformity with the provisions of the Contract.
- 4. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price of the equivalent of Euro 5,219,788 that is: five milion two hundred and nineteen thousand seven hundred eighty-eight at the times 36 months from the Commencement date and in compliance with Working Schedule and in the manner prescribed by the Contract.
- 5. The Contractor acknowledges, that all eligible payments due to the Contractor pursuant to the Contract shall be approved by the Bank and therefore the Employer shall not be responsible for paying to the Contractor (or carrying out) any payments from the Contract other than those approved and accepted by the Bank in compliance with the terms and conditions set forth in this Contract.

In Witness whereof the parties hereto have caused this Agreement to be executed the day and year first before written in accordance with their respective laws.

SIGNED by:

SIGNED by:

Mr. Miroslav Obert – Vice-Chairman of the Board of Directors

Mr. Jiří Malysák – Vice-Chairman of the Board

Mr. Ján Horváth – Chairman of the Board of Directors

for and on behalf of the Employer

for and on behalf of the Contractor

Date:

Date:

 <p>javys jadrnová výstavba společnost</p>	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 The Letter of Acceptance
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BIDSF project C7-A3

**ERECTION OF THE NEW LARGE CAPACITY
F&D FACILITY NPP V1**

B. The Letter of Acceptance



LETTER OF ACCEPTANCE

Bratislava, September, 2011

TO: **VF, a.s.**, náměstí Míru 50, 679 21 Černá Hora, Czech Republic

This is to notify you that your tender dated 29th of July 2011 for the execution of the **C7-A3 Erection of the New Large Capacity F&D Facility NPP V1** for the Contract Price of the equivalent of Euro 5,219,788 that is: five million two hundred nineteen thousand seven hundred eighty-eight Euro, as corrected and modified in accordance with the Instructions to Tenderers, is hereby accepted by us.

You are hereby required:

(a) to submit the performance security for 10% of the Accepted Contract Amount, in the currencies and proportions in which the Contract Price is payable;

(b) sign the attached Contract Agreement and return to;

Jadrová a vyrad'ovacia spoločnosť, a.s.
BIDSF PMU – Procurement Group
Building No. 750-IX-5
919 31 Jaslovské Bohunice

(c) to commence performance of the said contract in accordance with the Contract Documents.

Authorised Signatures:

.....
Mr. Ján Horváth
Chairman of the Board of Directors

.....
Mr. Miroslav Obert
Vice-Chairman of the Board of Directors

Name of Employer: Jadrová a vyrad'ovacia spoločnosť a.s.

Attachment: Contract Documents (Originals 1 - 4)

Jadrová a vyrad'ovacia spoločnosť, a.s., Tomášikova 22, 821 02 Bratislava, Slovenská republika
Telefón: +421/33/531 1111, Fax: +421/33/531 6565, E-mail: info@javys.sk, Internet: www.javys.sk
IČO: 35 946 024, DIČ: 2022036599, zapísaná v OR Okresného súdu Bratislava I, odd. Sa, vložka č. 4649/B




 <p>javys jadrná výstavba spoločnosť</p>	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 The Letter of Tender
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BIDSF project C7-A3

**ERECTION OF THE NEW LARGE CAPACITY
F&D FACILITY NPP V1**


C. The Letter of Tender

 <p>javys jednová výradba spoločnosť</p>	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 The Conditions of Particular Application
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BIDSF project C7-A3


**ERECTION OF THE NEW LARGE CAPACITY
F&D FACILITY NPP V1**

D. The Conditions of Particular Application


	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 The Conditions of Particular Application
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CONDITIONS OF PARTICULAR APPLICATION TO GENERAL CONDITIONS


1 General Provisions	
1.1.1 The Contract	Add Sub-Clause 1.1.1.11 "Intellectual and Industrial Property Rights" means intellectual property rights referred to in Sub-Clause 17.5 [<i>Intellectual and Industrial Property Rights</i>]
1.1.2 Parties and Persons	Delete Sub-Clause 1.1.2.8 and substitute with: "Subcontractor" means any person named in the Contract as a Subcontractor, or specialist Subcontractor, or any person appointed as a Subcontractor, for a part of the Works; and the legal successors in title to each of these persons. Add Sub-Clause 1.1.2.11 "PMU team" means the Project Management Unit formed by the Employer, as part of the Employer's Shutdown Department to undertake the management and implementation of the BIDSF funded or co-funded projects for Bohunice NPP V1. Add Sub-Clause 1.1.2.12 "Commercial Code" means Act No. 513/1991 Coll. Commercial Code, as subsequently amended.
1.1.3 Dates, Tests, Periods and Completion	Delete Sub-Clause 1.1.3.2. and substitute with: 1.1.3.2. "Commencement Date" means the date notified by the Engineer as specified under Sub-Clause 8.1. Delete Sub-Clause 1.1.3.7 "Defect Notification Period" and substitute with: 1.1.3.7 "Defect Notification Period" or "Contractor Warranty Period" means the period for notifying defects in the Works or a Section (as the case may be) under Sub-Clause 11.1 [<i>Completion of Outstanding Work and Remedying Defects</i>], as stated in the Appendix to Tender (with any extension under Sub-Clause 11.3 [<i>Extension of Defects Notification Period</i>]), calculated from the date on which the Works or Section is completed as certified under Sub-Clause 10.1 [<i>Taking Over of the Works and Sections</i>]. Add Sub-Clause 1.1.3.10 "Certificate of Temporary Operation" means a certificate issued under Clause 10.2 [<i>Taking Over of Parts of Work</i>]
1.1.4 Money and Payments	Delete Sub-Clause 1.1.4.4 and substitute with: 1.1.4.4 "Final Payment Certificate" means the Final Deliverable Acceptance Protocol issued under sub-Clause 14.13 [Issue of Final Payment Certificate]. Delete Sub-Clause 1.1.4.7 and substitute with: 1.1.4.7 "Interim Payment Certificate" means a Deliverable Acceptance Protocol issued under Clause 14 [Contract Price and Payment] other than the Final Deliverable Acceptance protocol."

	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 The Conditions of Particular Application
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	Delete Sub-Clause 1.1.4.9 and substitute with: 1.1.4.9 "Payment Certificate" means a Deliverable Acceptance Protocol issued under Clause 14 [Contract Price and Payment]"
1.1.5 Works and Goods	Delete Sub-Clause 1.1.5.5 "Plant" and substitute with: 1.1.5.5 " Plant " means equipment, machinery, and other tangible items including monitoring, information processing and communications related hardware and software systems, intended to form or forming part of the Permanent Works.
1.1.6 Other Definitions	Add the following definitions: 1.1.6.10 The " European Bank for Reconstruction and Development (EBRD) 'the Bank' ," is the Administrator of the grant(s), which refers to the funds made available to the Employer (the Recipient) under an Agreement between the Bank as the Administrator of funds of the Bohunice International Decommissioning Support Fund and the Recipient of such funds under the established rules. 1.1.6.11 The " Project " means the project C7-A3 – "Erection of the New Large Capacity F&D Facility NPP V1", located at JAVYS Nuclear Power Plant Jaslovské Bohunice, Slovak Republic, for which the Works under this Contract shall be performed by the Contractor.
1.3 Communications	Delete a) and b) and substitute by: Any document, information, notice, correspondence or other communication to be given by one Party to the other Party or to the Engineer relating to the Contract shall be in writing and in the English language and may be delivered in person (against receipt) or by letter (registered post and against receipt) or facsimile (confirmed by the addressee personal answer back), addressed to the other Party or the Engineer in accordance with the following provisions of this clause.
1.4 Law and Language	After the first paragraph add the following: Unless the Contract provides otherwise, the mutual contractual relationship explicitly not governed by the Contract shall be governed by the provisions of the Commercial Code. Without prejudice to any provision of this Contract, the Parties agrees that application of any legal regulation of the Slovak republic which is not mandatory is explicitly excluded in the scope in which its application could change (in the whole or in the part) meaning or content of any provision of this Contract.
1.5 Priority of the Documents	Delete and replace by: The documents forming the Contract are to be taken as mutually explanatory of one another. For purposes of interpretation, the priority of the documents shall be in accordance with the following sequence: 1) A. The Contract Agreement 2) B. The Letter of Acceptance 3) C. The Letter of Tender 4) D. The Conditions of Particular Application 5) E. The Appendix to Tender 6) F. The General Conditions 7) G. Clarification questions and answers

	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 The Conditions of Particular Application
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	<p>8) H. The Employer's Requirements constituted by:</p> <ul style="list-style-type: none"> H1 Technical Specifications H2 Schedule of works H3 Drawings and other documentation H4 QA and QC surveillance requirements H5 Safety and Technical Conditions <p>9) I. The Contractor's Proposal constituted by:</p> <ul style="list-style-type: none"> I1 Technical Proposal I2 Project organization and Time schedule I3 Price Schedules I4 List of spare parts I5 List of Subcontractors I6 Manufacturers' Authorisation form <p>10) J. The Performance Security</p> <p>If an Ambiguity or discrepancy is found in the documents, Section 266 of the Commercial Code shall apply.</p>
1.15 Confidentiality	<p>Add Sub-Clause 1.15:</p> <p>With the signature of this Contract the Contractor hereby gives its consent to publish on the website of the Employer and on any other places chosen by the Employer, for an indefinite time period, the whole Contract including any eventual future amendments and appendixes and enclosures of the Contract and any other documents related to the Contract. Also, the Contractor hereby gives its consent to publish on the website of the Employer and on any other places chosen by the Employer for an indefinite time period any invoices issued by the Contractor in relation to this Contract. The Employer shall bear all costs related to the publication of the above mentioned documents. To avoid any uncertainties, the Contractor grants also its consent to publish information underlying trade secrecy according § 17 of the Commercial Code contained in the above mentioned documents by means as stated above whereby the publication of these information does not represent breach of the trade secrecy by the Employer. Also, the Contractor hereby acknowledges that any information provided by the Contractor contained in the abovementioned documents shall not be considered as confidential according §271 of the Commercial Code.</p> <p>Despite of the above authorization of the Employer to publish the above mentioned documents, the Contractor shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out obligations under it or to comply with applicable Laws. The Contractor shall not publish, permit to be published, or disclose any particulars of the Works in any trade or technical paper or elsewhere without the previous written agreement of the Employer. Without a written agreement of the Employer, the Contractor shall be liable for any damages caused by provision of these information to third persons.</p>
1.16 EBRD and Employer Audits	<p>Add Sub-Clause 1.16:</p> <p>The Contractor shall permit the Bank and/or the Employer to inspect the Contractor's accounts and records relating to the performance of the Contract and to have them audited by auditors acceptable to the Bank or</p>

	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 The Conditions of Particular Application
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	the Employer.
1.17 Irrevocability of the granted licenses	Add Sub-Clause 1.17: Any license granted to the Employer to access and use Software supplied to the Employer under the Contract, shall be irrevocable
1.18 Authorized representative	Add Sub-clause 1.18: Any action required or permitted to be taken, and any document required or permitted to be executed, with the exception of adjustments to the Contract Price or the Price Schedules or the Quantities and Prices under Clause 13.3 [Variations Procedure], under this Contract by the Employer or the Contractor may be taken or executed by the officials: For the Employer: Mr. Jaroslav Mičůch, Head of Decommissioning Project Implementation Section For the Contractor: Mr. Jiří Malysák – Vice-chairman of the Board
2. The Employer	
2.2 Permits, Licenses or Approvals	At the end of Sub-Clause 2.2 Any proposal, inspection, examination, testing, consent, approval or similar act by the Employer (including absence of disapproval) shall not relieve the Contractor from any responsibility, including responsibility for his errors, omissions, or discrepancies, and non-compliance with Sub-Clauses 5.3 [<i>Contractor's Undertaking</i>] and 5.4 [<i>Technical Standards and regulations</i>].
2.4 Employer's Financial Arrangements	At the end of Sub-Clause 2.4 add: Pursuant to an agreement between the Bank as the Administrator of the Fund (the Fund) and the Employer as Recipient of the grant(s) being administered by the Bank, the Employer intends using part of the proceeds of the grant(s) for eligible payments under the Contract. Payment by the Bank will be made on behalf of the Employer and only at the request of the Employer and upon approval by the Bank in accordance with the terms and conditions of the Grant Agreement entered by and between the Bank and the Employer on conditions of the Project funding and will be subject in all respects to the terms and conditions of that agreement. The proceeds of the Bank's grant(s) will not be used for payments to persons or entities or for any import of goods if such payment or import is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. Except as the Bank may specifically otherwise agree, no other party other than the Employer shall derive any rights from the agreement or have any rights to the proceeds of the grant(s).
3. The Engineer	
3.1 Engineer's Duties and Authority	At the end of Sub-Clause 3.1 add: The duties of the Engineer shall be exercised by the Head of Decommissioning Project Implementation Section.

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3.2 Delegation by the Engineer	Delete in the second paragraph the following text: "And who are fluent in the language for communications defined in Sub- Clause 1.4 [Law and Language]
3.6 Management Meeting	Add Sub-Clause 3.6: The Engineer may require the Contractor to attend management meeting at times and places to be specified by the Engineer. The Contractor shall appoint qualified personnel, with authority, to participate in such meetings. The business of each management meeting shall be to review the anticipated arrangements for future work and to resolve any matters raised in accordance with this Sub-Clause. The Engineer shall record the business of monthly progress meeting and provide copies of this record to those attending the meeting and to the Employer. The responsibility of the parties for any actions to be taken shall be included in such record and shall, if not agreed in accordance with the Contract, be submitted by the Engineer. The Contractor's Representative shall notify the Engineer at the earliest opportunity of specific likely future events or circumstances, which may adversely affect the work, increase the Contract Price or delay the execution of the Works. The Engineer may require the Contractor to submit an estimate of the anticipated effect of the future event or circumstances, and/or a proposal under Sub-Clause 13.3. The Contractor shall submit such estimate and/or proposal as soon as practicable. The Contractor's Representative shall co-operate with the Engineer in making and considering proposals to mitigate the effect of any such event or circumstances, and in carrying out instructions of the Engineer.
4. The Contractor	
4.2 Performance Security	In the second paragraph, replace the first sentence by the following: The Contractor shall deliver the Performance Security to the Engineer within 28 days after receiving the Letter of Acceptance.
4.3 Contractor's Representative	After the third paragraph, add: If the Contractor asks the Engineer for consent to a replacement of the Contractor's Representative, the Engineer shall not withhold his prior consent provided that suitable replacement person is appointed. After the last paragraph, add: If the Contractor's Representative, or such persons, is not fluent in Slovak and/or English, the Contractor shall make a competent interpreter available during all working hours.
4.4 Subcontractors	Delete Sub-Clause 4.4 (b) and substitute with: (b) The prior consent of the Engineer in the form specified in Sub-Clause 1.3 shall be obtained to other proposed Subcontractors, After the last paragraph, add: (d) Where practicable, the Contractor shall give a fair and reasonable opportunity for contractors from Slovakia to be appointed as Subcontractors.

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	<p>(e) Assignment of Benefit of Subcontractor If a Subcontractor's obligations extend beyond the expiry date of the relevant Defects Notification Period, the Contractor shall so inform the Engineer and subject to the consent of the Engineer, the Contractor shall assign the benefit of such obligations to the Employer as of the expiry date of the relevant Defects Notification Period.</p>
4.8 Safety Procedures	<p>At the end of Sub-Clause 4.8 add:</p> <p>The Contractor shall be solely responsible for conducting operations under this Contract to avoid risk of harm to the health and safety of persons and property and for inspecting and monitoring all its plant, equipment, materials, and work practices to ensure compliance with its obligations under this Contract.</p> <p>The Contractor's failure to correct any unsafe condition or unsafe act by its employees or his Subcontractors may, at the sole discretion of the Engineer or the Employer, be grounds for notice by the Engineer or the Employer instructing the Contractor or his Subcontractors to immediately stop the affected works or operations until the unsafe act or condition is corrected to the Employer's satisfaction, at the Contractor's expense. In the event of immediate danger, verbal notice may be given followed by written notice within 2 days.</p> <p>If the unsafe act or condition continues despite notice and reasonable opportunity to effect a resolution, the Employer may, at its sole discretion, correct, or have corrected, the unsafe act or condition at the Contractor's expense pursuant to Sub-Clause 11.4 [Failure to Remedy Defects] or terminate this Contract pursuant to Clause 15 [Termination by Employer].</p> <p>Except as stated below, the Contractor shall furnish all safety equipment required to safely complete the Works and shall require the use of such safety equipment, and shall provide safety instructions to its employees. All safety equipment must be manufactured to a standard acceptable to the Employer.</p> <p>The Employer will provide the Contractor's personnel and his Subcontractor's personnel with basic clothing used to perform works in the radiation controlled area (i.e., white cotton overalls, footwear, hard hat, jacket, thermal underwear (in the winter)), and gloves, goggles, respirator, and plastic-wear as required).</p> <p>The Employer will provide service of radiation protection to the Contractor's and his Subcontractors' personnel, guidance to the Contractor and his Subcontractors on the radioactive environment of the Site and will provide radiation monitoring allowing identification of radiation sources. The Employer will also provide radiation monitors to insure that the Contractor and his Subcontractors are following appropriate radiation safety practices.</p> <p>If hazardous or unknown materials are encountered, the works shall stop until the Contractor's health protection representative or other qualified individual can identify and ensure it is safe to continue working. As required, the health protection shall specify the means of safe disposal for any hazardous material.</p>

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	<p>If dedicated radiation limit is encountered, the Contractor and his Subcontractors shall immediately stop the affected works or operations and leave the affected area. Verbal notice may be given followed by written notice within 2 days. The Employer shall provide the Contractor's personnel withdrawal outside the high and intermediate level waste area.</p> <p>Such works or operations affected by the radioactive wastes shall not resume until the condition is corrected to the Employer's satisfaction (by others), at the Employer's expense. The Employer will endeavour to remedy the situation within 3 days.</p> <p>The Contractor shall have no authority or responsibility for the accumulation, removal, temporary storage, transportation, or disposal of radioactive high and intermediate level wastes at the Site.</p> <p>As a minimum, the Contractor's Safety Procedures shall conform to and comply with:</p> <ul style="list-style-type: none"> - All applicable laws, ordinances, statutes, rules, regulations, and codes governing safety and health in the workplace, and Contractor's specific scope of Works under this Contract. - The Contractor shall instruct its personnel on the requirements of his Safety Plan, other safety related plans, and coordinate with other contractors and Subcontractors on Site regarding safety matters. - The Contractor shall take into account the provisions of the requirements of the Employer subject of H5 "Safety and Technical Conditions". 															
4.9 Quality Assurance	After wording: The Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the Contract to be added: in accordance with H4 "QA and QC Surveillance requirements"															
4.16 Transport of Goods	Delete in (a) 21 days' notice and replace for 30 days' notice.															
4.19 Electricity, Water and Gas	<p>To be added:</p> <p>The Contractor shall supply the material and installation of the networks of the below indicated utilities inside the NPP V1 and shall be full responsible for the provision of any other service he may require.</p> <p>All energy and services related to the implementation of this project requested to the Employer by the Contractor will be charged to the Contractor in accordance with the price list below.</p> <table border="1"> <thead> <tr> <th>Utilities</th> <th>Unit of measure</th> <th>Unit price/unit of measure in €</th> </tr> </thead> <tbody> <tr> <td>* Electric power supply without above standard secured power supply</td> <td>kWh</td> <td>€ 0.0769</td> </tr> <tr> <td>Technological water</td> <td>m³</td> <td>€ 0.16</td> </tr> <tr> <td>Demineralized water</td> <td>liter</td> <td>€ 0.07</td> </tr> <tr> <td>Pressure air</td> <td>m³</td> <td>€ 0.034</td> </tr> </tbody> </table>	Utilities	Unit of measure	Unit price/unit of measure in €	* Electric power supply without above standard secured power supply	kWh	€ 0.0769	Technological water	m ³	€ 0.16	Demineralized water	liter	€ 0.07	Pressure air	m ³	€ 0.034
Utilities	Unit of measure	Unit price/unit of measure in €														
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Pressure air	m ³	€ 0.034														

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	Other services		
	Provision of offices including furniture and services over 40 m2 in object 640/V1	m ² /month	€ 5.23
	Renting a PC (computer station) and its operation (e. g. ARSOZ, ...)	pc/month	€ 392.64
	Renting of Bridge Crane (electrical) in the bldg. 800:V1, room R301 - SKET 250/32/2t, including operator	pc/hour	€ 140.06
	Renting of Bridge Crane (electrical) in the bldg. 800:V1, room R301 - SSUB 32/8t, reference number 800002, including operator	pc/hour	€ 56.71
	Renting of Bridge Crane (electrical) in the bldg. 800:V1, room R301 - SSUB 32/8t, reference number 800003, including operator	pc/hour	€ 55.06
	Prices valid for 2011. *Prices depending on the decision of URSO (Regulatory Office of Network Industry) will be invoiced in compliance with the Decrees of URSO. www.urso.gov.sk .		
4.20 Employer's Equipment And Free-Issue Material	Not applicable The Employer will not make available equipment for the use of the Contractor.		
4.21 Progress Reports	After the last paragraph, add: In addition to the Monthly Progress Reports identified above, the following reports shall be prepared, submitted and kept updated in a consistent manner by the Contractor to Engineer's in the form, format, and quantity required: <ol style="list-style-type: none"> 1. <u>Project Baseline Time Schedule;</u> covering the whole project from Contract Commencement Date to the take-over process. 2. <u>Detailed Engineering and Procurement Time Schedule;</u> indicating the main engineering and procurement activities including interrelationships between construction activities, interfaces with detailed design engineering and procurement activities. 3. <u>Detailed Preparation and Erection Programme;</u> for civil works 		

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	<p>and erection indicating the major dismantling and erection logic and duration of major activities and shall be coordinated with the delivery dates of major components and systems.</p> <p>4. <u>Detailed Testing and Commissioning Programme;</u> indicating the major testing and commissioning logic and duration of major activities.</p> <p>Monthly submittals are due by the 7th day of the month following the month being reported on (or the last work-day before the 7th if the 7th occurs on a non-workday)</p>
4.22 Security on the Site	To be added: The Contractor shall fulfil the requirements stated in H5 "Safety and Technical Conditions".
4.23 Contractor's Operations on Site	To be added: The Contractor shall fulfil the requirements stated in H5 "Safety and Technical Conditions".
5. Design	
5.2 Contractor's Documents	<p>In the fourth paragraph replace:</p> <p>"each review period shall not exceed 21 days", by "each review period shall not exceed 42 days"</p> <p>In the fourth paragraph after the first sentence add the following:</p> <p>If the Contractors' documentation is subject to permission or authorization of Regulators, the review and approval period shall be extended for the period of the Regulators' authorization.</p>
5.4 Technical Standards and Regulations	<p>After second paragraph add:</p> <p>National or international standards other than the Country's that ensure substantial equivalence or more stringent requirements will be acceptable, after approval by the Employer.</p>
5.6 As-Built Documents	<p>In the first paragraph, delete two copies and replace by three (3) copies in electronic version.</p> <p>In the last paragraph, delete types of copies and substitute types of electronic and hard copies in a format acceptable to the Engineer.</p>
6. Staff and Labor	
6.6 Facilities for Staff And Labour	<p>To be deleted and replaced by:</p> <p>The Employer shall ensure for the use by the Contractor and his personnel, of the following facilities/services:</p> <ol style="list-style-type: none"> a) Office accommodation for the Contractor at Bohunice V1 NPP site of at least 20m² but not more than 40m² in good decorative order and suitably furnished and with the following services: <ul style="list-style-type: none"> - Heat, light and power at no cost to the Contractor, - International telephone lines for telephone, fax, and e-mail connections. The cost of all telephone calls shall be met by the Contractor, b) Provisions of information and documentation on all technical and commercial data, documentation, drawings etc. that could be relevant

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	<p>for the Project and establishment of adequate and optimised interfaces to other departments of Bohunice V1 NPP,</p> <ul style="list-style-type: none"> c) Permission for reasonable use by the Contractor of other facilities, e.g. meeting rooms, by agreement with the Employer's management, d) Access to the Employer's controlled area, including required facilities for washing and changing clothes, toilets, etc. e) Access to the Employer's health and safety facilities, including dosimeters, industrial safety, first aid, ambulance and emergency services at no cost to the Contractor, f) Access to the Employer's canteen at the Bohunice NPP site, g) Contractor's reasonable requirements for truck parking, car parking and storage (location shall be allocated by agreement with Employer's management) at the Bohunice NPP site at no cost to the Contractor, h) Reasonable storage facilities for Contractor's Project Equipment (location shall be allocated by agreement with Employer's management). <p>The above facilities/services requested and received free of charge by the Contractor from the Employer, shall be listed, signed and approved by the Employer pursuant to Sample forms in H5 (Safety and Technical Conditions).</p>
6.7 Health & Safety	At the beginning of Sub-Clause 6.7, add: To the extent allowed by law, the Contractor shall assume all responsibility and liability with respect to all matters regarding the safety and health of its employees and the employees of his Subcontractors, with respect to the risks under this Contract. Add into second paragraph after wording "responsible for maintenance safety and protection against accidents" the words "in accordance with Decree of the Government of the SR No. 396/2006 Col."
6.8 Superintend- ence	At the end of Sub-Clause 6.8 add: At least one of the Contractor's superintending staff shall have a working knowledge of Slovak language or the Contractor shall have competent interpreting services available on Site during all working hours.
6.9 Contractor's personnel	to be added after (d) <ul style="list-style-type: none"> e) is guilty of serious misconduct f) is involved in any conduct which is considered as fraudulent, corrupt, coercive or collusive practice g) fails to comply with Slovak Law in discharging his assigned duties <p>The Contractor shall be aware that it may be obliged to pay the penalties set forth in Part H5 of the Contract "Safety and Technical Conditions" and resulting from its personnel failing to meet obligations specified in Part H5 of the Contract "Safety and Technical Conditions".</p> <p>At the end of the last paragraph, add:</p>

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	Such replacement shall be at Contractor's cost and shall not be cause of an extension of time under Sub-clause 8.4 (Extension of Time for Completion)
7. Plant, Materials and Workmanship	
7.1 Manner of Execution	At the end of the sub-clause add the following new paragraphs: Plant and Materials to be incorporated in the Works shall be new, unused, and of the most recent or up-to-date models and incorporate all recent improvements in design and materials, unless otherwise provided for in the Employer's Requirements. Where national standards of the Country are specified, Plant, Materials, and workmanship that meets other authoritative standards, and which ensure an equal or higher quality of performance and work execution, also acceptable.
7.8 Royalties	Delete Sub-Clause b) and substitute: The Employer shall pay royalties, rents and other payments for the disposal of utilisable waste from demolitions and dismantling. The Contractor shall be responsible for manipulation, transport and disposal of the demolition and dismantling wastes in accordance with H1 – Technical Specification.
7.9 Eligibility	All Goods shall have their origin in eligible source countries as at 1 st January 2011 they are: EU member states, Switzerland, and the EBRD's Countries of Operations.
9. Tests on Completion	
9.1 Contractor's obligations	Delete first paragraph of Sub-Clause 9.1, and substitute: The Contractor shall carry out the Tests on Completion in accordance with this Clause, and Sub-Clause 7.4 [<i>Testing</i>] and the H1 - Technical Specifications and drawings [chapter Testing & Acceptance], after providing the documents in accordance with Sub-Clause 5.6 [<i>As-Built Documents</i>] and Sub-Clause 5.7 [<i>Operation and Maintenance Manuals</i>].
10. Employer's Taking Over	
10.1 Taking Over the Works and Sections	Delete in the first paragraph the last sentence: "or is deemed to have been issued in accordance with this Sub-Clause." Replace in the last paragraph, in the last sentence "the Taking- Over Certificate shall be deemed to have been issued on the last day of that period", with "the Contractor shall be entitled to claim subject to Sub-Clause 20.1 [Contractor's Claims]".
10.2 Taking Over of Parts of the Works	Replace all text except the last paragraph by the following: Upon completion of relevant part of the Works and successful passing of Tests as specified under Sub-clause 9.1 of the Contract, the Engineer or appointed representative by him at the request of the Employer may request Building Authority to issue Certificate for Temporary Operation for any part of the Permanent Works. In this case: a) The Employer shall be responsible for operation of this part of the

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	<p>Works in compliance with operating and maintenance manuals developed by the Contractor and submitted in accordance to Sub-clause 5.7[Operation and Maintenance Manuals]. During the transitory period of operation by the Employer of the part of the Works for which the Certificate for Temporary Operation was issued, the Contractor shall provide technical support for the operation as it is specified in the G1 Technical specifications, and</p> <p>b) The Contractor shall be liable for performing his contractual obligations in a due care and especially the responsibilities under the Sub-clause 17.2 [Contractor's Care of the Works] for the part of the equipment for which the Certificate for Temporary Operation was issued until completion of all Works, successful termination of the pre-commissioning and commissioning tests and issuance of the Taking-Over Certificate for the corresponding section."</p>
10.3 Interference with Tests on Completion	Replace in the first paragraph "the Employer shall be deemed to have taken over the Works or Section (as the case may be) on the date when the Tests on Completion would otherwise have been completed" with "it shall be entitled to claim subject to Sub-Clause 20.1 [Contractor's Claims]."
11.Defects Liability	
11.10 Unfulfilled obligations	<p>The following clause supplements sub-clause 11.10:</p> <p>The Latent Defects Liability Period for the Works which comprise all Works, Plant and Materials which are civil works and or civil structures shall be one hundred and twenty (120) months from the date of Completion of the Works or one hundred and fourteen (114) months from the date of issue of Performance Certificate for the facility (or any part thereof), whichever first occurs, unless specified otherwise herein.</p> <p>The Latent Defects Liability Period for the Works which comprise all Works, Plant and Materials other than civil works and or civil structures shall be sixty (60) months from the date of Completion of the Works or fifty four (54) months from the date of issue of Performance Certificate for the facility (or any part thereof), whichever first occurs, unless specified otherwise herein.</p> <p>If any Latent Defect shall appear in any part of the Works, Plant and Materials within the Latent Defects Liability Period the same shall with all reasonable speed be made good by the Contractor by repair or replacement at the Employer's option provided that the defect was caused by the negligence of the Contractor or if the defect would not have been disclosed by a reasonable examination prior to the expiry of the Defect Notification Period.</p> <p>The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the Plant and Materials for the Latent Defects Liability Period. Spare parts and components shall be supplied as promptly as possible, but at the most within six (6) months of placing the order and opening the letter of credit. In addition, in the event of termination of the production of spare parts, advance notification will be made to the Employer of the pending termination, with sufficient time to permit the Employer to procure the needed requirement. Following such termination, the Contractor</p>

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	will deliver a copy to the extent possible and at no cost the Employer of two such blueprints, drawings and specifications of the spare parts for the purpose of procuring such spare parts himself.
13. Variation and Adjustments	
13.1. Right to Vary	After the first paragraph add the following: Substantial variations to the Contract including variations to the total Contract Price and to the Time for Completion of the Works must be made by means of an amendment and may not be instructed by the sole discretion of the Engineer.
13.5 Provisional Sums	Not applicable
13.6 Day work	Not applicable
14. Contract Price and Payment	
14.1 The Contract price	a) Delete and replace by: The Contract Price shall be the Accepted Contract Amount and shall be a fixed lump-sum including all staff costs, Subcontractors' costs, printing, communications, travel, accommodation, and the like, and all other costs incurred by the Contractor in carrying out the Works described in the Employer's Requirements and in accordance with the contractual requirements. The Contract Price shall not be subject to variation during the implementation of the Contract unless it is stated otherwise in the Contract's conditions. The Contract price shall be without any and all taxes, customs duties levied in the territory of the Slovak Republic. b) to be added after " <i>duties and fees required to be paid by him under the contract</i> ", the following text "in the country of his operation". To be added in the end: In the field of taxes, customs duties and fees the course of action shall be taken in accordance with the Framework Agreement concluded between the EBRD and the Slovak Republic. http://www.javys.sk/en/index.php?page=vyradovanie-jadrovoenergeticky-zariadeni/v1-npp-decommissioning-documents
14.4 Schedule of Payments	Last paragraph delete and replace by: Referring to the first paragraph, the following Schedule of Payments shall be the basis for the payment milestones in which the Contract Price will be paid, confirmed by the Acceptance protocol of: <ol style="list-style-type: none"> 1. Acceptance of the Preliminary Environmental Study in accordance with § 22 Act No. 24/2006 Coll. 5 % 2. Acceptance of the Detailed Design (final) 10 % 3. Issuance of the Decision of the Regulatory Authority 10 %

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	<table border="0"> <tr> <td>4. Disconnection and Dismantling of the Existing Equipment</td> <td>20 %</td> </tr> <tr> <td>5. Completion of Installation of New Systems</td> <td>20 %</td> </tr> <tr> <td>6. Successful Completion of Pre-commissioning and Commissioning tests</td> <td>15 %</td> </tr> <tr> <td>7. Issuance of Taking-Over Certificate</td> <td>10 %</td> </tr> <tr> <td>8. Acceptance of the Final Contract Completion Report</td> <td>10 %</td> </tr> </table>	4. Disconnection and Dismantling of the Existing Equipment	20 %	5. Completion of Installation of New Systems	20 %	6. Successful Completion of Pre-commissioning and Commissioning tests	15 %	7. Issuance of Taking-Over Certificate	10 %	8. Acceptance of the Final Contract Completion Report	10 %
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7. Issuance of Taking-Over Certificate	10 %										
8. Acceptance of the Final Contract Completion Report	10 %										
14.7 Payment	<p>To be added at the end:</p> <p>The following points shall be observed when submitting invoices for payment.</p> <p>All invoices with the accepted protocols and itemized specification of performed Works and delivered Goods with prices shall be addressed and sent to the Employer who will approve them and forward them to the Bank for payment. The Bank in turn will approve the invoices prior to paying the Contractor on behalf of the Employer.</p> <p>All foreign invoices shall be issued bilingually in English and Slovak language.</p> <p>The name and telephone number of a person who may be contacted in case of need to raise queries shall be quoted on the invoice.</p> <p>The contract number and the payment milestone shall be quoted on the invoice.</p> <p>Invoices shall be marked as an invoice showing invoice number, issue date, delivery date of goods and services, due date of the invoice, business address of the Employer and Contractor, their company registration number and TINs. When services are provided into other EU member country, the VAT duty shall be transferred to the Employer. In the case that goods are delivered into other EU member country, the Contractor shall state reference pursuant to which he applies the VAT exemption.</p> <p>The invoice shall include also a column marked "Gross" (Price without taxes), a column marked "Taxes" (tax rates and tax) and column marked "Net". The amount to be shown in the column "Gross" is the amount corresponding to the payment milestone and shall be free from any and all taxes, customs duties or other fees or mandatory payments levied by, or in the territory of, the Slovak Republic. The amount to be shown in column "Net" is the amount to be invoiced after deduction of the corresponding amortization rate of the Advance payment. In the column "Taxes" shall be the amount of the all taxes, customs duties or other fees or mandatory payments levied by, or in the territory of, the Slovak Republic. The Bank will only make payments after the original signed copy of the Contract has been returned via the Employer to the Bank and only on submission of original invoices and original supporting receipts.</p> <p>Invoice payments will be made by direct transfer to the bank account specified in the Contract.</p> <p>Full details of the bank account where payment shall be made shall also be stated on the invoices, including currency of the account and SWIFT number (if available).</p> <p>For the purpose of the refunding of the taxes, customs duties levied by, or</p>										

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	<p>in the territory of, the Slovak Republic;</p> <ul style="list-style-type: none"> - The VAT number (VAT registration in Slovak tax office obtained on the basis of the registration of the Contractor in Slovak Republic) should be inscribed on the invoices or the VAT registration number from its country if it is not registered in Slovak Republic and - The Contractor should enclose the relevant documents (invoices, others) demonstrating the amount and payment of the required refunding amount. <p>Number of Invoices: 2 originals and 2 copies</p> <p>b) and c) to be deleted and replaced by:</p> <p>All payments, including refunding amounts, should be made within sixty days of the acceptance by the Employer of the Contractor's valid invoice, with full supporting documentation in accordance with the requirements of the Contract.</p> <p>Notwithstanding, submittal requirements mentioned elsewhere, the following submittals, in the prescribed form/format are prerequisite to payment (other than any approved Advance Payment):</p> <ul style="list-style-type: none"> - Insurance Certificates and Securities; - Health and Safety Plan; - Programme; - Quality Manual/Planning of quality management system
14.8. Delayed Payment	<p>The first sentence to be replaced by the following:</p> <p>If the Contractor does not receive payment in accordance with Sub-Clause 14.7, the Contractor shall be entitled to claim a per annum delay interest, from the due unpaid amount for each day of delay pro rata, in the amount of 1% above 1M EURIBOR, divided by number of weeks in the given calendar year.</p> <p>To be added at the end:</p> <p>For purposes of this Clause 14.8 "1M EURIBOR" means the percentage rate per annum determined by the European Banking Federation for the offering of deposits in Euro for a period of one month, displayed on the appropriate page of the Telerate screen or Reuters screen as of 11.00 a.m. (Bratislava time) on the due date. If no such screen rate is available, 1M EURIBOR shall be the arithmetic mean (rounded downward to four decimal places) of the rates as supplied to the Employer at its request quoted by three reference banks, selected by the Employer, to leading banks in the European interbank market, as of 11.00 a.m. (Bratislava time) on the due date.</p>
14.9 Payment of Retention Money	Not applicable
15.Termination by the Employer	
15.2	After item (f) insert:

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Termination by Employer	<p>(g) In the judgment of the Employer, the Contractor has engaged in corrupt, fraudulent, coercive or collusive practices in competing for or in the executing of the Contract. For the purpose of this Clause:</p> <ul style="list-style-type: none"> (i) "Corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party. (ii) "Fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation. (iii) "Coercive practice" means impairing or harming, or threatening to impair or harm, direct or indirectly, any party or the property of the party to influence improperly the actions of a party. (iv) "Collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party.
17. Risk and Responsibility	
17.1 Indemnities	This clause shall be replaced by the following: Liability for damage that has occurred as a consequence of, or in relation to, the Contract shall be governed by the provisions of Section 373 and subsequent sections of the Commercial Code as set forth herein. Therefore, if the Contractor breaches its stipulated Contract obligations, or any applicable legal regulations, and causes the Employer damage the Contractor shall compensate for the damage in compliance with the following principles: (a) The Contractor shall compensate all damages and all costs incurred to the Employer as a consequence of, or in relation with, the failure of the Contractor to comply with his obligations in the Contract or in the applicable legal regulations. (b) Damages shall not include loss of profit. (c) Damages shall include, but (subject to the exclusion in (b) above) not be limited to, damage that occurs as a consequence of, or in relation with: <ul style="list-style-type: none"> (i) Bodily injury, sickness, disease or death of any person whatsoever arising out of, or in the course of, or by reason of the Contractor's design, execution and completion of, the Works and the remedying of any defects. (ii) Damage to, or loss of, any property, which has arisen as a consequence of, or in relation with: <ul style="list-style-type: none"> - a defect or imperfection of the Contractor's design, the execution and completion of the Works and the remedying of any defects; - breach of an obligation pursuant to this Contract by the Contractor, the Contractor's Personnel or by any other person for whom the Contractor is liable; - a failure to notify a defect or imperfection in the

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	<p>Contractor's design or the Employer's instruction, if the Contractor is responsible for notifying such defect or imperfection pursuant to the Contract.</p> <p>If the Employer breaches any of its stipulated Contract obligations, or any applicable legal regulations, and causes damage to the Contractor, the Employer shall compensate for the damage in compliance with the following principles:</p> <p>(a) Subject to (b), (c) (d) and (e) below, the Employer shall compensate all damages and all costs incurred to the Contractor as a consequence of, or in relation with, the failure of the Employer to comply with his obligations in the Contract or in the applicable legal regulations.</p> <p>(b) Damages shall not include loss of profit.</p> <p>(c) The Employer shall compensate for costs and/or damages only up to a total compensation amount of 100% of the Contract Price.</p> <p>(d) The Employer shall not be obliged to compensate for any damage caused to the Contractor for a delay in the Employer's obligation to pay the Contractor on time. Only the provisions of Clause 14.8 shall apply to any such delayed payments, and</p> <p>(e) The Employer shall not be obliged to compensate for any damage that is covered by insurance pursuant to Clause 18.1.</p> <p>The indemnity provisions of this Clause 17.1 shall not apply to Clause 17.5.</p>
17.5 Intellectual and Industrial Property Rights	<p>At the beginning of the Sub-Clause add the following new paragraph:</p> <p>The Intellectual Property Rights in all software shall remain vested in the owner of such rights.</p> <p>Delete the second paragraph.</p> <p>The third paragraph shall be replaced by the following:</p> <p>The Employer hereby gives a promise of indemnity pursuant to Section 725 of the Commercial Code and undertakes to indemnify the Contractor for any evidenced damages or expenses incurred by the Contractor as the result of a third party claim brought against the Contractor in connection with the Contractor discharging its obligations under this agreement and which is or was:</p> <p>(a) An unavoidable result of the Contractor's compliance with the Employer's Requirements, or</p> <p>(b) A result of any Works being used by the Employer,</p> <p style="padding-left: 40px;">(i) For a purpose other than that indicated by, or reasonably to be inferred from, the Contract, or</p> <p style="padding-left: 40px;">(ii) In conjunction with any thing not supplied by the Contractor, unless such use was disclosed to the Contractor prior to the Commencement Date or is stated in the Contract.</p> <p>Such obligation to indemnify shall exist only in the event that the cost, expense or damage to the Contractor has not been caused by wilful misconduct or grossly negligent actions by the Contractor and that the Contractor has diligently defended such claim. For the purposes of this</p>

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	<p>promise of indemnity, the Employer hereby confirms having requested the Contractor to perform the activities set out in this agreement, without the Contractor having been under a prior legal obligation to do so. The Employer shall not be liable to the Contractor for any indirect or consequential damages or loss profit.</p> <p>Fourth paragraph shall be replaced by the following:</p> <p>The Contractor hereby gives a promise of indemnity pursuant to Section 725 of the Commercial Code and undertakes to indemnify the Employer for any evidenced damages or expenses incurred by the Employer as the result of a third party claim brought against the Employer in connection with the Employer discharging its obligations under this agreement and which arises out of or in relation to (i) the manufacture, use, sale or import of any Goods, or (ii) any design for which the Contractor is responsible.</p> <p>Such obligation to indemnify shall exist only in the event that the cost, expense or damage to the Employer has not been caused by wilful misconduct or grossly negligent actions by the Employer and that the Employer has diligently defended such claim. For the purposes of this promise of indemnity, the Contractor hereby confirms having requested the Employer to perform the activities set out in this agreement, without the Employer having been under a prior legal obligation to do so. The Contractor shall not be liable to the Employer for any indirect or consequential damages or loss profit.</p> <p>At the beginning of the fifth paragraph add the following: Whenever a Party receives a notice of any claim, it shall give notice to the other Party within 28 days of receiving the claim.</p>
17.7 Nuclear Liability	Add Sub-Clause 17.7: Liability for Nuclear Damage. Nuclear third party liability shall be governed by the provisions of Vienna Convention on Civil Liability for Nuclear Damage of May 21, 1963 and in accordance with act No 541/2004 Coll. of December 1, 2004 of the Slovak Republic on the peaceful use of nuclear energy and on amendments and supplements to certain acts as amended together with Act No. 125/2006 Coll. on State supervision of work safety. All terms used in this clause shall have the same meaning as defined in Vienna Convention on Civil Liability for Nuclear Damage of May 21, 1963, except in case of international acts or omissions.
18. Insurance	
18.1 , 18.2, 18.3, 18.4	Clauses 18.1 to 18.4 to be deleted and replaced with : 18.1. Requirements for Insurances Contractor shall obtain and maintain in full force and effect during the Term of this Contract the insurance described below on terms and conditions approved by the Employer, and shall provide to the Employer certificates evidencing such coverage: (a) Insurance of costs related to implementation of the Works including all materials, salaries, transport expenses, prices, and fees that are subject of the Contract in the course of construction,

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	<p>erection/installation, and testing. The insurance shall include expenses for demolition and for removal of demolition debris and cover also damages resulting from errors in the design, use of defective material and deficiencies in the works performed.</p> <p>(b) Insurance against loss of, and damage to, the property in the possession, use, care or administration of the Employer on the site in the course of construction, erection/installation, and testing of new plants.</p> <p>(c) Insurance against loss of, and damage to, materials and equipment in the course of their transportation to the site.</p> <p>(d) Insurance against loss of, and damage to, the property of the Contractor on the site (construction machinery, equipment, devices, tools, etc).</p> <p>(e) The insurance indicated in Items (a) and (b) shall cover all risks of construction and erection/installation including but not limited to risks of fire, flood, storm wind, and earthquake. Assessment of the insured property shall amount to its 100% replacement value.</p> <p>(f) Commercial general insurance and product liability insurance against injury to health or life of the injured person or against damage to things caused by a defective product, and completed works liability insurance against injury to health and/or material damage caused to third parties. The insurance limit shall be the limit for an insured event amounting to no less than the amount specified in Appendix to Tender, Item 18.1.</p> <p>(g) Third party liability insurance against injury to health and/or material damage caused to third parties resulting from construction, erection/installation, and testing on the site (for the limit see Appendix to Tender, Item 18.1).</p> <p>(h) Compulsory third party liability (motor) insurance pursuant to Slovak laws.</p> <p>The periods of submission of insurance are stated in Appendix to Tender 18.1.</p>
20. Claims, dispute and arbitration	
20.2, 20.3, 20.4, 20.7, 20.8	Clauses 20.2, 20.3, 20.4, 20.7 and, 20.8 to be deleted
20.5.	To be deleted and replaced with the following: "All disputes arising from the execution of or in connection with the Contract shall be first settled through amicable negotiation between the Parties. Each Party must appoint representatives with authority to settle the dispute. Where the Parties are unable to settle a dispute within fifty-six (56) days

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	<p>from the date of receipt by one Party of the written notice from the other Party specifying that a dispute exists and giving details about such a dispute, either Party may refer the dispute to arbitration in accordance with Section 20.6."</p>
20.6. Arbitration	<p>First sentence to be deleted and replaced with:</p> <p>"Disputes, which can not be settled amicably pursuant to section 20.5. shall be finally settled by international arbitration."</p> <p>Delete the text:</p> <p>"The arbitrator(s) shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, and any decision of the DAB, relevant to the dispute. Nothing shall disqualify the Engineer from being called as a witness and giving evidence before the arbitrator(s) on any matter whatsoever relevant to the dispute.</p> <p>Neither Party shall be limited in the proceedings before the arbitrator(s) to the evidence nor shall arguments previously put before the DAB to obtain its decision, or to the reasons for dissatisfaction given in its notice of dissatisfaction. Any decision of the DAB shall be admissible in evidence in the arbitration.</p> <p>Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Engineer and the DAB shall not be altered by reason of any arbitration being conducted during the progress of the Works."</p> <p>and replace with the text:</p> <p>"The arbitrator(s) shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, relevant to the dispute. Nothing shall disqualify the Engineer from being called as a witness and giving evidence before the arbitrator(s) on any matter whatsoever relevant to the dispute.</p>
	<p>Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties and the Engineer shall not be altered by reason of any arbitration being conducted during the progress of the Works.</p> <p>The place of arbitration shall be Bratislava, Slovak Republic.</p> <p>The arbitration shall be governed by the law defined in sub-clause 1.4 (Law and Language).</p> <p>The arbitration decision shall be final and binding upon the Parties.</p> <p>The costs of the arbitration shall be in the discretion of the arbitrators."</p>

 <p>javys stavby výstavby společnost</p>	BIDSF Project	C7-A3 "ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1" BIDSF 010 5 001	C7-A3 The General Conditions
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BIDSF project C7-A3

**ERECTION OF THE NEW LARGE CAPACITY
F&D FACILITY NPP V1**

F. The General Conditions

Conditions of Contract
for **PLANT and Design-Build**

FOR ELECTRICAL AND MECHANICAL WORKS AND FOR BUILDING AND
ENGINEERING WORKS DESIGNED BY THE CONTRACTOR

General Conditions

1st Edition 1999

FEDERATION INTERNATIONALE DES INGENIEURS-CONSEILS
INTERNATIONAL FEDERATION OF CONSULTING ENGINEERS
INTERNATIONALE VEREINIGUNG BERATENDER INGENIEURE
FEDERACION INTERNACIONAL DE INGENIEROS CONSOLTORES

General Conditions

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General Conditions

General Provisions

1.1

Definitions

In the Conditions of Contract ("these Conditions"), which include Particular Conditions and these General Conditions, the following words and expressions shall have the meanings stated. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

1.1.1

The Contract

- 1.1.1.1 "**Contract**" means the Contract Agreement, the Letter of Acceptance, the Letter of Tender, these Conditions, the Employer's Requirements, the Schedules, the Contractor's Proposal, and the further documents (if any) which are listed In the Contract Agreement or In the Letter of Acceptance.
- 1.1.1.2 "**Contract Agreement**" means the contract agreement (If any) referred to in Sub-Clause 1.6 [*Contract Agreement*].
- 1.1.1.3 "**Letter of Acceptance**" means the letter of formal acceptance, signed by the Employer, of the Letter of Tender, Including any annexed memoranda comprising agreements between and signed by both Parties. If there Is no such letter of acceptance, the expression "Letter of Acceptance" means the Contract Agreement and the date of issuing or receiving the Letter of Acceptance means the date of signing the Contract Agreement.
- 1.1.1.4 "**Letter of Tender**" means the document entitled letter of tender, which was completed by the Contractor and includes the signed offer to the Employer for the Works.
- 1.1.1.5 "**Employer's Requirements**" means the document entitled employer's requirements, as included in the Contract and any additions and modifications to such document in accordance with the Contract Such document specifies the purpose, scope, and/or design and/or other technical criteria, for the Works.
- 1.1.1.6 "**Schedules**" means the document(s) entitled schedules, completed by the Contractor and submitted with the Letter of Tender, as included in the Contract. Such document may include data lists and schedules of payments and/or prices.
- 1.1.1.7 "**Contractor's Proposal**" means the document entitled schedules, completed by the Contractor and submitted with the Letter of Tender, as included in the Contract. Such document may include the Contractor's preliminary design.
- 1.1.1.8 "**Tender**" means the Letter of Tender and all other documents with the Contractor submitted with the Letter of Tender as included In the Contract.
- 1.1.1.9 "**Tender**" means the completed pages entitled appendix to tender which are appended to and form part of the Letter of Tender.

**1.1.2
Parties and Persons**

- 1.1.1.10 "**Schedule of Guarantees**" and "**Schedule of Payments**" mean the documents so named (if any) which are comprised in the Schedules.
- 1.1.2.1 "**Party**" means the Employer or the Contractor, as the context requires.
- 1.1.2.2 "**Employer**" means the person named as employer in the Appendix to Tender and the legal successors in title to this person.
- 1.1.2.3 "**Contractor**" means the person(s) named as contractor in the Letter of Tender accepted by the Employer and the legal successors in title to this person(s).
- 1.1.2.4 "**Engineer**" means the person appointed by the Employer to act as the Engineer for the purposes of the Contract and named in the Appendix to Tender, or other person appointed from time to time by the Employer and notified to the Contractor under Sub-Clause 3.4 [*Replacement of the Engineer*].
- 1.1.2.5 "**Contractor's Representative**" means the person named by the Contractor in the Contract or appointed from time to time by the Contractor under Sub-Clause 4.3 [*Contractor's Representative*], who acts on behalf of the Contractor.
- 1.1.2.6 "**Employer's Personnel**" means the Engineer, the assistants referred to in Sub-Clause 3.2 [*Delegation by the Engineer*] and all other staff, labour and other employees of the Engineer and of the Employer; and any other personnel notified to the Contractor, by the Employer or the Engineer, as Employer's Personnel.
- 1.1.2.7 "**Contractor's Personnel**" means the Contractor's Representative and all personnel whom the Contractor utilises on Site, who may include the staff, labour and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Works.
- 1.1.2.8 "**Subcontractor**" means any person named in the Contract as a subcontractor, or any person appointed as a subcontractor, for a part of the Works; and the legal successors in title to each of these persons.
- 1.1.2.9 "**DAB**" means the person or three persons so named in the Contract or other person(s) appointed under Sub-Clause 20.2 [*Appointment of the Dispute Adjudication Board*] or Sub-Clause 20.3 [*Failure to Agree Dispute Adjudication Board*].
- 1.1.2.10 "**FIDIC**" means the Fédération Internationale des Ingénieurs-Conseils the international federation of consulting engineers.

**1.1.3
Dates, Tests, Periods
and Completion**

- 1.1.3.1 "**Base Date**" means the date 28 days prior to the latest date for submission of the Tender.
- 1.1.3.2 "**Commencement Date**" means the date notified under Sub-Clause 8.1 [*Commencement of Works*].
- 1.1.3.3 "**Time for Completion**" means the time for completing the Works or a Section (as the case may be) under Sub-Clause 8.2 [*Time for Completion*], as stated in the Appendix to Tender (with any extension under Sub-Clause



8.4 [*Extension of Time for Completion*]), calculated from the Commencement Date.

1.1.3.4 "**Tests on Completion**" means the tests which are specified in the Contract or agreed by both Parties or instructed as a Variation, and which are carried out under Clause 9 [*Tests on Completion*] before the Works or a Section (as the case may be) are taken over by the Employer.

1.1.3.5 "**Taking-Over Certificate**" means a certificate issued under Clause 10 [*Employer's Taking Over*].

1.1.3.6 "**Tests after Completion**" means the tests (if any) which are specified in the Contract and which are carried out under Clause 12 [*Tests after Completion*] after the Works or a Section (as the case may be) are taken over by the Employer.

1.1.3.7 "**Defects Notification Period**" means the period for notifying defects in the Works or a Section (as the case may be) under Sub-Clause 11.1 [*Completion of Outstanding Work and Remedying Defects*], as stated in the Appendix to Tender (with any extension under Sub-Clause 11.3 [*Extension of Defects Notification Period*]), calculated from the date on which the Works or Section is completed as certified under Sub-Clause 10.1 [*Taking Over of the Works and Sections*].

1.1.3.8 "**Performance Certificate**" means the certificate issued under Sub-Clause 11.9 [*Performance Certificate*].

1.1.3.9 "**day**" means a calendar day and "**year**" means 365 days.

1.1.4

Money and Payments

1.1.4.1 "**Accepted Contract Amount**" means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.

1.1.4.2 "**Contract Price**" means the price defined in Sub-Clause 14.1 [*The Contract Price*], and includes adjustments in accordance with the Contract.

1.1.4.3 "**Cost**" means all expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit.

1.1.4.4 "**Final Payment Certificate**" means the payment certificate issued under Sub-Clause 14.13 [*Issue of Final Payment Certificate*].

1.1.4.5 "**Final Statement**" means the statement defined in Sub-Clause 14.11 [*Application for Final Payment Certificate*].

1.1.4.6 "**Foreign Currency**" means a currency in which part (or all) of the Contract Price is payable, but not the Local Currency.

1.1.4.7 "**Interim Payment Certificate**" means a payment certificate issued under Clause 14 [*Contract Price and Payment*], other than the Final Payment Certificate.

1.1.4.8 "**Local Currency**" means the currency of the Country.

1.1.4.9 "**Payment Certificate**" means a payment certificate issued under Clause 14 [*Contract Price and Payment*].

- 1.1.4.10 "**Provisional Sum**" means a sum (if any) which is specified in the Contract as a provisional sum, for the execution of any part of the Works or for the supply of Plant, Materials or services under Sub-Clause 13.5 [*Provisional Sums*].
- 1.1.4.11 "**Retention Money**" means the accumulated retention moneys which the Employer retains under Sub-Clause 14.3 [*Application for Interim Payment Certificates*] and pays under Sub-Clause 14.9 [*Payment of Retention Money*].
- 1.1.4.12 "**Statement**" means a statement submitted by the Contractor as part of an application, under Clause 14 [*Contract Price and Payment*], for a payment certificate.

**1.1.5
Works and Goods**

- 1.1.5.1 "**Contractor's Equipment**" means all apparatus, machinery, vehicles and other things required for the execution and completion of the Works and the remedying of any defects. However, Contractor's Equipment excludes Temporary Works, Employer's Equipment (if any), Plant, Materials and any other things intended to form or forming part of the Permanent Works.
- 1.1.5.2 "**Goods**" means Contractor's Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.
- 1.1.5.3 "**Materials**" means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, Including the supply-only materials (If any) to be supplied by the Contractor under the Contract.
- 1.1.5.4 "**Permanent Works**" means the permanent works to be executed by the Contractor under the Contract.
- 1.1.5.5 "**Plant**" means the apparatus, machinery and vehicles intended to form or forming part of the Permanent Works.
- 1.1.5.6 "**Section**" means a part of the Works specified in the Appendix to Tender as a Section (if any).
- 1.1.5.7 "**Temporary Works**" means all temporary works of every kind (other than Contractor's Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.
- 1.1.5.8 "**Works**" mean the Permanent Works and the Temporary Works, or either of them as appropriate.

**1.1.6
Other Definitions.**

- 1.6.1 "**Contractor's Documents**" means the calculations, computer programs and other software, drawings manuals models and other document of a technical nature (If any) supplied by the Contractor under the Contract; as described in Sub-Clause 5.2 [*Contractor's Documents*].
- 1.1.6.2 "**Country**" means the country in which the Site (or most of it) is located where the Permanent Works are to be executed.
- 1.1.6.3 "**Employer's Equipment**" means the apparatus, machinery and vehicles (if any) made available by the Employer for the use of the Contractor In the execution of the Works, as stated in the Employer's Requirements; but does not include Plant which has not been taken over by the Employer.
- 1.1.6.4 "**Force Majeure**" is defined In Clause 19 [*Force Majeure*].

- 1.1.6.5 **"Laws"** means all national (or state) legislation, statutes, ordinances and other laws, and regulations and by-laws of any legally constituted public authority.
- 1.1.6.6 **"Performance Security"** means the security (or securities, if any) under Sub-Clause 4.2 [*Performance Security*].
- 1.1.6.7 **"Site"** means the places where the Permanent Works are to be executed and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site.
- 1.1.6.8 **"Unforeseeable"** means not reasonably foreseeable by an experienced contractor by the date for submission of the Tender.
- 1.1.6.9 **"Variation"** means any change to the Employer's Requirements or the Works, which is Instructed or approved as a variation under Clause 13 [*Variations and Adjustments*].

1.2

Interpretation

In the Contract, except where the context requires otherwise:

- (a) words indicating one gender include all genders;
- (b) words indicating the singular also include the plural and words indicating the plural also include the singular;
- (c) provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing, and
- (d) "written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

The marginal words and other headings shall not be taken into consideration in the Interpretation of these Conditions.

1.3

Communications

Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices and requests, these communications shall be:

- (a) in writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the Appendix to Tender; and
- (b) delivered, sent or transmitted to the address for the recipient's communications as stated in the Appendix to Tender. However:
 - (i) if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and
 - (ii) if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued.

Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Engineer, a copy shall be sent to the Engineer or the other Party, as the case may be.

1.4

Law and Language

The Contract shall be governed by the law of the country (or other jurisdiction) stated in the Appendix to Tender.

If there are versions of any part of the Contract which are written in more than one language, the version which is in the ruling language stated in the Appendix to Tender shall prevail.

The language for communications shall be that stated In the Appendix to Tender. If no language is stated there, the language for communications shall be the language in which the Contract (or most of it) is written.

1.5

Priority of Documents

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be In accordance with the following sequence:

- (a) the Contract Agreement (if any),
- (b) the Letter of Acceptance,
- (c) the Letter of Tender,
- (d) the Particular Conditions,
- (e) these general Conditions,
- (f) the Employer's Requirements,
- (g) the Schedules, and
- (h) the Contractor's Proposal and any other documents forming part of the Contract.

If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction.

1.6

Contract Agreement

The Parties shall enter Into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, unless they agree otherwise. The Contract Agreement shall be based upon the form annexed to the Particular Conditions. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Employer.

1.7

Assignment

Neither Party shall assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, either Party:

- (a) may assign the whole or any part with the prior agreement of the other Party at the sole discretion of such other Party, and
- (b) may, as security in favour of a bank or financial institution, assign Its right to any moneys due, or to become due, under the Contract.

1.8

Care and Supply of Documents

Each of the Contractor's Documents shall be In the custody and care of the Contractor, unless and until taken over by the Employer. Unless otherwise stated in the Contract, the Contractor shall supply to the Engineer six copies of each of the Contractor's Documents.

The Contractor shall keep, on the Site a copy of the Contract, publications named in the Employer's Requirements, the Contractor's Documents and Variations and other communications given under the Contract. The Employer's Personnel shall have the right of access to all these documents at all reasonable times

1.9 If a Party becomes aware of an error or defect of a technical nature in a document which was prepared for use in executing the Works the Party shall promptly give notice to the other Party of such error or defect.

6

Errors in the Employer's Requirements

If the Contractor suffers delay and/or Incurs Cost as a result of an error In the Employer's Requirements, and an experienced contractor exercising due care would not have discovered the error when scrutinising the Employer's Requirements under Sub-Clause 5.1 [*General Design Obligations*], the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, If completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine (i) whether and (if so) to what extent the error could not reasonably have been so discovered, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

1.10

Employer's Use of Contractor's Documents

As between the Parties, the Contractor shall retain the copyright and other intellectual property rights in the Contractor's Documents and other design documents made by (or on behalf of

The Contractor shall be deemed (by signing the Contract) to give to the Employer a non-terminable transferable non-exclusive royalty-free licence to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This licence shall:

- (a) apply throughout the actual or itended working life (whichever is longer) of the relevant parts of the Works,
- (b) entitle any person In proper possession of the relevant part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and
- (c) in the case of Contractor's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by the Contract, including replacements of any computers supplied by the Contractor.

The Contractor's Documents and other design documents made by (or on behalf of) the Contractor shall not, without the Contractor's consent be used copied or communicated to a third party by (or on behalf of) the Employer for purposes other than those permitted under this Sub-Clause.

1.11

Contractor's Use of Employer's Documents

As between the Parties, the Employer shall retain the copyright and other intellectual property rights In the Employer's Requirements and other documents made by (or on behalf of) the Employer. The Contractor may at his cost copy use and obtain communication of these documents for the purposes; of the Contract They shall not, without the Employer's consent, be copied used or communicated to a third party by the Contractor, except as necessary for the purposes of the Contract.

1.12

Confidential Details

The Contractor shall disclose all such confidential and other information as the Engineer may reasonably require in order to verify the Contractor's compliance with the Contract.

**1.13
Compliance with Laws**

The Contractor shall, in performing the Contract, comply with applicable Laws. Unless otherwise stated in the Particular Conditions:

- (a) the Employer shall have obtained (or shall obtain) the planning, zoning or similar permission for the Permanent Works, and any other permissions described in the Employer's Requirements as having been (or being) obtained by the Employer; and the Employer shall Indemnify and hold the Contractor harmless against and from the consequences of any failure to do so; and
- (b) the Contractor shall give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the Laws In relation to the design, execution and completion of the Works and the remedying of any defects; and the Contractor shall indemnify and hold the Employer harmless against and from the consequences of any failure to do so.

1.14

Joint Several Liability

If the Contractor constitutes (under applicable Laws) a joint venture, consortium or other unincorporated grouping of two or more persons:

- (a) these persons shall be deemed to be jointly and severally liable to the Employer for the performance of the Contract;
- (b) these persons shall notify the Employer of their leader who shall have authority to bind the Contractor and each of these persons; and
- (c) the Contractor shall not alter Its composition or legal status without the prior consent of the Employer.

The Employer

2.1

Right of Access to the Site

The Employer shall give the Contractor right of access to, and possession of, all parts of the Site within the time (or times) stated In the Appendix to Tender. The right and possession may not be exclusive to the Contractor. If, under the Contract, the Employer is required to give (to the Contractor) possession of any foundation, structure, plant or means of access, the Employer shall do so In the time and manner stated in the Employer's Requirements. However, the Employer may withhold any such right or possession until the Performance Security has been received.

If no such time Is stated In the Appendix to Tender, the Employer shall give the Contractor right of access to, and possession of, the Site within such times as may be required to enable the Contractor to proceed in accordance with the programme submitted under Sub-Clause 8.3 [*Programme*].

If the Contractor suffers delay and/or Incurs Cost as a result of a failure by the Employer to give any such right or possession within such time, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed under Sub-Clause 8.4 [*Extension of Time for Completion*], and ,
- (b) payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.

After, receiving this notice, the Engineer shall proceed In accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

However, if and to the extent that the Employer's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, Cost or profit.

2.2

Permits, Licences or Approvals

The Employer shall (where he is in a position to do so) provide reasonable assistance to the Contractor at the request of the Contractor:

- (a) by obtaining copies of the Laws of the Country which are relevant to the Contract but are not readily available, and
- (b) for the Contractor's applications for any permits, licences or approvals required by the Laws of the Country:
 - (i) which the Contractor is required to obtain under Sub-Clause 1.13 *[Compliance with Laws]*,
 - (ii) for the delivery of Goods, including clearance through customs, and
 - (iii) for the export of Contractor's Equipment when it is removed from the Site.

2.3

Employer's Personnel

The Employer shall be responsible for ensuring that the Employer's Personnel and the Employer's other contractors on the Site:

- (a) co-operate with the Contractor's efforts under Sub-Clause 4.6 *[Co-operation]* and
- (b) take actions similar to those which the Contractor is required to take under sub paragraphs (a), (b) and (c) of Sub-Clause 4.8 *[Safety Procedures]* and under Sub-Clause 4.18 *[Protection of the Environment]*.

2.4

Employer's Financial Arrangements

The Employer shall submit, within 28 days after receiving any request from the Contractor, reasonable evidence that financial arrangements have been made and are being maintained which will enable the Employer to pay the Contract Price (as estimated at that time) in accordance with Clause 14 *[Contract Price and Payment]*. If the Employer intends to make any material change to his financial arrangements, the Employer shall give notice to the Contractor with detailed particulars.

2.5

Employer's Claims

If the Employer considers himself to be entitled to any payment under any Clause of these Conditions or otherwise in connection with the Contract, and/or to any extension of the Defects Notification Period, the Employer or the Engineer shall give notice and particulars to the Contractor. However, notice is not required for payments due under Sub-Clause 4.19 *[Electricity, Water and Gas]*, under Sub-Clause 4.20 *[Employer's Equipment and Free-Issue Material]*, or for other services requested by the Contractor.

The notice shall be given as soon as practicable after the Employer became aware of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Notification Period shall be given before the expiry of such period.

The particulars shall specify the Clause or other basis of the claim, and shall include substantiation of the amount and/or extension to which the Employer considers himself to be entitled in connection with the Contract. The Engineer shall then proceed in accordance with Sub-Clause 3.5 *[Determinations]* to agree or determine (i) the amount (if any) which the Employer is entitled to be paid by the Contractor,

and/or (ii) the extension (if any) of the Defects Notification Period in accordance with Sub-Clause 11.3 [*Extension of Defects Notification Period*].

This amount may be included as a deduction In the Contract Price and Payment Certificates. The Employer shall only be entitled to set off against or make any deduction from an amount certified in a Payment Certificate, or to otherwise claim against the Contractor, in accordance with this Sub-Clause.

The Engineer

3.1 Engineer's Duties and Authority

The Employer shall appoint the Engineer who shall carry out the duties assigned to him in the Contract. The Engineer's staff shall include suitably qualified engineers and other professionals who are competent to carry out these duties.

The Engineer shall have no authority to amend the Contract.

The Engineer may exercise the authority attributable to the Engineer as specified in or necessarily to be implied from the Contract. If the Engineer is required to obtain the approval of the Employer before exercising a specified authority, the requirements shall be as stated in the Particular Conditions. The Employer undertakes not to impose further constraints on the Engineer's authority, except as agreed with the Contractor.

However, whenever the Engineer exercises a specified authority for which the Employer's approval is required, then (for the purposes of the Contract) the Employer shall be deemed to have given approval.

Except as otherwise stated in these Conditions:

- (a) whenever carrying out duties or exercising authority, specified in or implied by the Contract, the Engineer shall be deemed to act for the Employer;
- (b) the Engineer has no authority to relieve either Party of any duties, obligations or responsibilities under the Contract; and
- (c) any approval, check, certificate, consent, examination, inspection, instruction notice, proposal, request, test, or similar act by the Engineer (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies and non-compliances.

3.2

Delegation by the Engineer

The Engineer may from time to time assign duties and delegate authority to assistants, and may also revoke such assignment or delegation. These assistants may include a resident engineer, and/or independent inspectors appointed to inspect and/or test items of Plant and/or Materials. The assignment, delegation or revocation shall be in writing and shall not take effect until copies have been received by both Parties.

However, unless otherwise agreed by both Parties, the Engineer shall not delegate the authority to determine any matter in accordance with Sub-Clause 3.5 [*Determinations*].

Assistants shall be suitably qualified persons, who are competent to carry out these duties and exercise this authority, and who are fluent in the language for communications defined in Sub-Clause 1.4 [*Law and Language*].

Each- assistant, to whom duties have been assigned or authority has been delegated, shall only be authorised to issue instructions to the Contractor to the extent defined

by the delegation. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by an assistant, in accordance with the delegation, shall have the same effect as though the act had been an act of the Engineer. However:

- (a) any failure to disapprove any work, Plant or Materials shall not constitute approval, and shall therefore not prejudice the right of the Engineer to reject the work, Plant or Materials;
- (b) if the Contractor questions any determination or instruction of an assistant, the Contractor may refer the matter to the Engineer, who shall promptly confirm, reverse or vary the determination or instruction.

3.3

Instructions of the Engineer

The Engineer may issue to the Contractor (at any time) instructions which may be necessary for the execution of the Works and the remedying of any defects, all in accordance with the Contract. The Contractor shall only take instructions from the Engineer, or from an assistant to whom the appropriate authority has been delegated under this Clause. If an instruction constitutes a Variation, Clause 13 [*Variations and Adjustments*] shall apply.

The contractor shall comply with the instructions given by the Engineer or delegated assistant, on any matter related to the Contract. These instructions shall be given in writing.

3.4

Replacement of the Engineer

If the Employer intends to replace the Engineer, the Employer shall, not less than 42 days before the intended date of replacement, give notice to the Contractor of the name, address and relevant experience of the intended replacement Engineer. The Employer shall not replace the Engineer with a person against whom the Contractor raises reasonable objection by notice to the Employer, with supporting particulars.

3.5

Determinations

Whenever these Conditions provide that the Engineer shall proceed in accordance with this Sub-Clause 3.5 to agree or determine any matter, the Engineer shall consult with each Party in an endeavour to reach agreement. If agreement is not achieved the Engineer shall make a fair determination in accordance with the Contract taking due regard of all relevant circumstances.

The Engineer shall give notice to both Parties of each agreement or determination with supporting particulars. Each Party shall give effect to each agreement or determination unless and until revised under Clause 20 [*Claims Disputes and Arbitration*].

The Contractor

4.1

Contractor's General Obligations

The Contractor shall design, execute and complete the Works in accordance with the Contract, and shall remedy any defects in the Works. When completed the Works shall be fit for the purposes for which the Works are intended as defined in the Contract.

The Contractor shall provide the Plant and Contractor's Documents specified in the Contract and all Contractor's Personnel, Goods, consumables and other things and services, whether of a temporary or permanent nature, required in and for this design, execution, completion and remedying of defects.

The Works shall include any work which is necessary to satisfy the Employer's Requirements, Contractor's Proposal and Schedules, or is implied by the Contract, and all works which (although not mentioned in the Contract) are necessary for stability or for the completion, or safe and proper operation, of the Works.

The Contractor shall be responsible for the adequacy, stability and safety of all Site operations, of all methods of construction and of all the Works.

The Contractor shall, whenever required by the Engineer, submit details of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works. No significant alteration to these arrangements and methods shall be made without this having previously been notified to the Engineer.

4.2

Performance Security

The Contractor shall obtain (at his cost) a Performance Security for proper performance, in the amount and currencies stated in the Appendix to Tender. If an amount is not stated in the Appendix to Tender, this Sub-Clause shall not apply.

The Contractor shall deliver the Performance Security to the Employer within 28 days after receiving the Letter of Acceptance, and shall send a copy to the Engineer. The Performance Security shall be issued by an entity and from within a country (or other jurisdiction) approved by the Employer, and shall be in the form annexed to the Particular Conditions or in another form approved by the Employer.

The Contractor shall ensure that the Performance Security is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects. If the terms of the Performance Security specify its expiry date, and the Contractor has not become entitled to receive the Performance Certificate by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the Performance Security until the Works have been completed and any defects have been remedied.

The Employer shall not make a claim under the Performance Security, except for amounts to which the Employer is entitled under the Contract in the event of:

- (a) failure by the Contractor to extend the validity of the Performance Security as described in the preceding paragraph, in which event the Employer may claim the full amount of the Performance Security,
- (b) failure by the Contractor to pay the Employer an amount due, as either agreed by the Contractor or determined under Sub-Clause 2.5 [*Employer's Claims*] or Clause 20 [*Claims, Disputes and Arbitration*], within 42 days after this agreement or determination,
- (c) failure by the Contractor to remedy a default within 42 days after receiving the Employer's notice requiring the default to be remedied, or
- (d) circumstances which entitle the Employer to termination under Sub-Clause 15.2 [*Termination by Employer*], irrespective of whether notice of termination has been given.

The Employer shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security to the extent to which the Employer was not entitled to make the claim.

The Employer shall return the Performance Security to the Contractor within 21 days after receiving a copy of the Performance Certificate.

**4.3
Contractor's
Representative**

The Contractor shall appoint the Contractor's Representative and shall give him all authority necessary to act on the Contractor's behalf under the Contract.

Unless the Contractor's Representative is named in the Contract, the Contractor shall, prior to the Commencement Date, submit to the Engineer for consent the name and particulars of the person the Contractor proposes to appoint as Contractor's Representative. If consent is withheld or subsequently revoked, or if the appointed person fails to act as Contractor's Representative, the Contractor shall similarly submit the name and particulars of another suitable person for such appointment.

The Contractor shall not, without the prior consent of the Engineer, revoke the appointment of the Contractor's Representative or appoint a replacement.

The whole time of the Contractor's Representative shall be given to directing the Contractor's performance of the Contract. If the Contractor's Representative is to be temporarily absent from the Site during the execution of the Works, a suitable replacement person shall be appointed, subject to the Engineer's prior consent, and the Engineer shall be notified accordingly.

The Contractor's Representative shall, on behalf of the Contractor, receive instructions under Sub-Clause 3.3 [*Instructions of the Engineer*].

The Contractor's Representative may delegate any powers, functions and authority to any competent person, and may at any time revoke the delegation. Any delegation or revocation shall not take effect until the Engineer has received prior notice signed by the Contractor's Representative, naming the person and specifying the powers functions and authority being delegated or revoked.

The Contractor's Representative and all these persons shall be fluent in the language for communications defined in Sub-Clause 1.4 [*Law and Language*].

**4.4
Subcontractors**

The Contractor shall not subcontract the whole of the Works.

The Contractor shall be responsible for the acts or defaults of any Subcontractor, his agents or employees, as if they were the acts or defaults of the Contractor. Unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall not be required to obtain consent to suppliers of Materials, or to a subcontract for which the Subcontractor is named in the Contract;
- (b) the prior consent of the Engineer shall be obtained to other proposed Subcontractors; and
- (c) the Contractor shall give the Engineer not less than 28 days' notice of the Intended date of the commencement of each Subcontractor's work and of the commencement of such work on the Site.

**4.5
Nominated
Subcontractors**

In this Sub-Clause, "nominated Subcontractor" means a Subcontractor whom the Engineer, under Clause 13 [*Variations and Adjustments*], instructs the Contractor to employ as a Subcontractor. The Contractor shall not be under any obligation to employ a nominated Subcontractor against whom the Contractor raises reasonable objection by notice to the Engineer as soon as practicable, with supporting particulars.

**4.6
Co-operation**

The Contractor shall, as specified in the Contract or as instructed by the Engineer, allow appropriate opportunities for carrying out work to:

- (a) the Employer's Personnel,
- (b) any other contractors employed by the Employer, and
- (c) the personnel of any legally constituted public authorities,

who may be employed In the execution on or near the Site of any work not included In the Contract.

Any such Instruction shall constitute a Variation if and to the extent that it causes the Contractor to incur Unforeseeable Cost. Services for these personnel and other contractors may include the use of Contractor's Equipment, Temporary Works or access arrangements which are the responsibility of the Contractor.

The Contractor shall be responsible for his construction activities on the Site, and shall co-ordinate his own activities with those of other contractors to the extent (if any) specified in the Employer's Requirements.

If, under the Contract, the Employer is required to give to the Contractor possession of any foundation, structure, plant or means of access in accordance with Contractor's Documents, the Contractor shall submit such documents to the Engineer in the time and manner stated in the Employer's Requirements.

4.7

Setting Out

The Contractor shall set out the Works in relation to original points, lines and levels of reference specified in the Contract or notified by the Engineer. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Works.

The Employer shall be responsible for any errors In these specified or notified items of reference, but the Contractor shall use reasonable efforts to verify their accuracy before they are used.

If the Contractor suffers delay and/or Incurs Cost from executing work which was necessitated by an error in these items of reference, and an experienced contractor could not reasonably have discovered such error and avoided this delay and/or Cost the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed under Sub-Clause 8.4 [*Extension of Time for Completion*] and
- (b) payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine (i) whether and (if so) to what extent the error could not reasonably have been discovered and (ii) the matters described in sub- paragraphs (a) and (b) above related to this extent.

4.8

Safety Procedures

The Contractor shall:

- (a) comply with all applicable safety regulations,
- (b) take care for the safety of all persons entitled to be on the Site,
- (c) use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons,
- (d) provide fencing, lighting, guarding and watching of the Works until completion and taking over under Clause10 [*Employer's Taking Over*],and

- (e) provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and of owners and occupiers of adjacent land.

4.9
Quality Assurance

The Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the Contract. The system shall be in accordance with the details stated in the Contract. The Engineer shall be entitled to audit any aspect of the system.

Details of all procedures and compliance documents shall be submitted to the Engineer for information before each design and execution stage is commenced. When any document of a technical nature is issued to the Engineer, evidence of the prior approval by the Contractor himself shall be apparent on the document itself.

Compliance with the quality assurance system shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.

4.10
Site Data

The Employer shall have made available to the Contractor for his information, prior to the Base Date, all relevant data in the Employer's possession on sub-surface and hydrological conditions at the Site, including environmental aspects. The Employer shall similarly make available to the Contractor all such data which come into the Employer's possession after the Base Date. The Contractor shall be responsible for interpreting all such data.

To the extent which was practicable (taking account of cost and time), the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Tender or Works. To the same extent, the Contractor shall be deemed to have inspected and examined the Site, its surroundings, the above data and other available information, and to have been satisfied before submitting the Tender as to all relevant matters, including (without limitation):

- (a) the form and nature of the Site, including sub-surface conditions,
- (b) the hydrological and climatic conditions,
- (c) the extent and nature of the work and Goods necessary for the execution and completion of the Works and the remedying of any defects,
- (d) the Laws, procedures and labour practices of the Country, and
- (e) the Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.

4.11
Sufficiency of the Accepted Contract Amount

The Contractor shall be deemed to:

- (a) have satisfied himself as to the correctness and sufficiency of the Accepted Contract Amount, and
- (b) have based the Accepted Contract Amount on the data, interpretations, necessary information, inspections, examinations and satisfaction as to all relevant matters referred to in Sub-Clause 4.10 [*Site Data*] and any further data relevant to the Contractor's design.

Unless otherwise stated in the Contract, the Accepted Contract Amount covers all the Contractor's obligations under the Contract (including those under Provisional Sums if any) and all things necessary for the proper design, execution and completion of the Works and the remedying of any defects.

**4.12
Unforeseeable Physical
Conditions**

In this Sub-Clause, "physical conditions" means natural physical conditions and man-made and other physical obstructions and pollutants, which the Contractor encounters at the Site when executing the Works, Including sub-surface and hydrological conditions but excluding climatic conditions.

If the Contractor encounters adverse physical conditions which he considers to have been Unforeseeable, the Contractor shall give notice to the Engineer as soon as practicable.

This notice shall describe the physical conditions, so that they can be inspected by the Engineer, and shall set out the reasons why the Contractor considers them to be Unforeseeable. The Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate for the physical conditions, and shall comply with any instructions which the Engineer may give. If an Instruction constitutes a Variation, Clause 13 [*Variations and Adjustments*] shall apply.

If and to the extent that the Contractor encounters physical conditions which are Unforeseeable, gives such a notice, and suffers delay and/or incurs Cost due to these conditions, the Contractor shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such Cost, which shall be included in the Contract Price.

After receiving such notice and inspecting and/or investigating these physical conditions, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine (i) whether and (If so) to what extent these physical conditions were Unforeseeable, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

However, before additional Cost is finally agreed or determined under sub-paragraph (ii), the Engineer may also review whether other physical conditions in similar parts of the Works (if any) were more favourable than could reasonably have been foreseen when the Contractor submitted the Tender. If and to the extent that these more favourable conditions were encountered, the Engineer may proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine the reductions in Cost which were due to these conditions, which may be included (as deductions) in the Contract Price and Payment Certificates. However, the net effect of all adjustments under sub-paragraph (b) and all these reductions, for all the physical conditions encountered in similar parts of the Works, shall not result in a net reduction in the Contract Price.

The Engineer may take account of any evidence of the physical conditions foreseen by the Contractor when submitting the Tender, which may be made available by the Contractor, but shall not be bound by any such evidence.

**4.13
Rights of Way and
Facilities**

The Contractor shall bear all costs and charges for special and/or temporary rights-of-way which he may require, including those for access to the Site. The Contractor shall

also obtain, at his risk and cost, any additional facilities outside the Site which he may require for the purposes of the Works.

**4.14
Avoidance of
Interference**

The Contractor shall not interfere unnecessarily or improperly with:

- (a) the convenience of the public, or

- (b) the access to and use and occupation of all roads and footpaths, irrespects of whether they are public or in the possession of the Employer or of others.

The Contractor shall Indemnify and hold the Employer harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from any such unnecessary or improper interference.

4.15

Access Route

The Contractor shall be deemed to have been satisfied as to the suitability and availability of access routes to the Site. The Contractor shall use reasonable efforts to prevent any road or bridge from being damaged by the Contractor's traffic or by the Contractor's Personnel. These efforts shall include the proper use of appropriate vehicles and routes.

Except as otherwise stated In these Conditions:

- (a) the Contractor shall (as between the Parties) be responsible for any maintenance which may be required for his use of access routes;
- (b) the Contractor shall provide all necessary signs or directions along access routes, and shall obtain any permission which may be required from the relevant authorities for his use of routes, signs and directions;
- (c) the Employer shall not be responsible for any claims which may arise from the use or otherwise of any access route,
- (d) the Employer does not guarantee the suitability or availability of particular access routes, and
- (e) Costs due to non-suitability or non-availability, for the use required by the Contractor, of access routes shall be borne by the Contractor.

4.16

Transport of Goods

Unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall give the Engineer not less than 21 days' notice of the date on which any Plant or a major item of other Goods will be delivered to the Site;
- (b) the Contractor shall be responsible for packing, loading, transporting, receiving, unloading, storing and protecting all Goods and other things required for the Works; and
- (c) the Contractor shall Indemnify and hold the Employer harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from the transport of Goods, and shall negotiate and pay all claims arising from their transport.

4.17

Contractor's Equipment

The Contractor shall be responsible for all Contractor's Equipment. When brought on to the Site, Contractor's Equipment shall be deemed to be exclusively intended for the execution of the Works. The Contractor shall not remove from the Site any major items of Contractor's Equipment without the consent of the Engineer. However, consent shall not be required for vehicles transporting Goods or Contractor's Personnel off Site.

4.18

Protection of the Environment

The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations.

The Contractor shall ensure that emissions, surface discharges and effluent from the Contractor's activities shall not exceed the values indicated in the Employer's Requirements, and shall not exceed the values prescribed by applicable Laws.

**4.19
Electricity, Water and
Gas**

The Contractor shall, except as stated below, be responsible for the provision of all power, water and other services he may require.

The Contractor shall be entitled to use for the purposes of the Works such supplies of electricity, water, gas and other services as may be available on the Site and of which details and prices are given in the Employer's Requirements. The Contractor shall, at his risk and cost, provide any apparatus necessary for his use of these services and for measuring the quantities consumed.

The quantities consumed and the amounts due (at these prices) for such services shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 [*Employer's Claims*] and Sub-Clause 3.5 [*Determinations*]. The Contractor shall pay these amounts to the Employer.

4.20

**Employer's Equipment
and Free-Issue Material**

the Employer shall make the Employer's Equipment (If any) available for the use of the Contractor In the execution of the Works in accordance with the details, arrangements and prices stated in the Employer's Requirements. Unless otherwise stated in the Employer's Requirements:

- (a) the Employer shall be responsible for the Employer's Equipment except that
- (b) the Contractor shall be responsible for each item of Employer's Equipment whilst any of the Contractor's Personnel is operating it, driving it, directing it or in possession or control of it.

The appropriate quantities and the amounts due (at such stated prices) for the use of Employer's Equipment shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 [*Employer's Claims*] and Sub-Clause 3.5 [*Determinations*]. The Contractor shall pay these amounts to the Employer.

The Employer shall supply, free of charge, the "free-issue materials" (if any) in accordance with the details stated in the Employer's Requirements. The Employer shall, at his risk and cost, provide these materials at the time and place specified in the Contract. The Contractor shall then visually inspect them, and shall promptly give notice to the Engineer of any shortage, defect or default In these materials. Unless otherwise agreed by both Parties, the Employer shall immediately rectify the notified shortage, defect or default.

After this visual inspection, the free-issue materials shall come under the care custody and control of the Contractor. The Contractor's obligations of inspection care custody and control shall not relieve the Employer of liability for any shortage defect or default not apparent from a visual inspection.

4.21

Progress Reports

Unless otherwise stated in the Particular Conditions monthly progress reports shall be prepared by the Contractor and submitted to the Engineer in six copies. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter each within 7 days after the last day of the period to which it relates.

Reporting shall continue until the Contractor has completed oil work which is known to-be outstanding at the completion date stated In the Taking-Over Certificate for the Works.

Each report shall include:

- (a) charts and detailed descriptions of progress, including each stage of design, Contractor's Documents, procurement, manufacture, delivery to Site, construction, erection, testing, commissioning and trial operation;
- (b) photographs showing the status of manufacture and of progress on the Site;
- (c) for the manufacture of each main Item of Plant and Materials, the name of the manufacturer, manufacture location, percentage progress, and the actual or expected dates of:
 - (i) commencement of manufacture,
 - (ii) Contractor's inspections,
 - (iii) tests, and
 - (iv) shipment and arrival at the Site;
- (d) the details described in Sub-Clause 6.10 [*Records of Contractor's Personnel and Equipment*];
- (e) copies of quality assurance documents, test results and certificates of Materials;
- (f) list of Variations, notices given under Sub-Clause 2.5 [*Employer's Claims*] and notices given under Sub-Clause 20.1 [*Contractor's Claims*];
- (g) safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations; and
- (h) comparisons of actual and planned progress, with details of any events or circumstances which may jeopardise the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays.

4.22

Security of the Site

Unless otherwise stated In the Particular Conditions:

- (a) the Contractor shall be responsible for keeping unauthorised persons off the Site, and
- (b) authorised persons shall be limited to the Contractor's Personnel and the Employer's Personnel; and to any other personnel notified to the Contractor, by the Employer or the Engineer, as authorised personnel of the Employer's other contractors on the Site.

4.23

Contractor's Operations on Site

The Contractor shall confine his operations to the Site, and to any additional areas which may be obtained by the Contractor and agreed by the Engineer as working areas. The Contractor shall take all necessary precautions to keep Contractor's Equipment and Contractor's Personnel within the Site and these additional areas, and to keep them off adjacent land.

During the execution of the Works, the Contractor shall keep the Site free from all unnecessary obstruction, and shall store or dispose of any Contractor's Equipment or surplus materials. The Contractor shall clear away and remove from the Site any wreckage, rubbish and Temporary Works which are no longer required.

Upon the issue of a Taking-Over Certificate, the Contractor shall clear away and remove, from that part of the Site and Works to which the Taking-Over Certificate refers, all Contractor's Equipment, surplus material, wreckage rubbish and Temporary Works. The Contractor shall leave that part of the Site and the Works in a clean and safe condition. However, the Contractor may retain on Site, during the Defects notification Period, such Goods as are required for the Contractor to fulfill obligations under the Contract.

**4.24
Fossils**

All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Employer. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.

The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it. If the Contractor suffers delay and/or Incurs Cost from complying with the instructions, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 *[Contractors Claims]* to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 *[Extension of Time for Completion]*, and
- (b) payment of any such Cost, which shall be included in the Contract Price.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 *[Determinations]* to agree or determine these matters.

Design

**5.1
General Design
Obligations**

The Contractor shall carry out, and be responsible for, the design of the Works. Design shall be prepared by qualified designers who are engineers or other professionals who comply with the criteria (if any) stated in the Employer's Requirements. Unless otherwise stated in the Contract, the Contractor shall submit to the Engineer for consent the name and particulars of each proposed designer and design Subcontractor.

The Contractor warrants that he, his designers and design Subcontractors have the experience and capability necessary for the design. The Contractor undertakes that the designers shall be available to attend discussions with the Engineer at all reasonable times, until the expiry date of the relevant Defects Notification Period.

Upon receiving notice under Sub-Clause 8.1 *[Commencement of Works]*, the Contractor shall scrutinise the Employer's Requirements (including design criteria and calculations, if any) and the items of reference mentioned in Sub-Clause 4.7 *[Setting Out]*. Within the period stated in the Appendix to Tender, calculated from the Commencement Date, the Contractor shall give notice to the Engineer of any error, fault or other defect found in the Employer's Requirements or these items of reference.

After receiving this notice, the Engineer shall determine whether Clause 13 *[Variations and Adjustments]* shall be applied, and shall give notice to the Contractor accordingly. If and to the extent that (taking account of cost and time) an experienced contractor exercising due care would have discovered the error, fault or other defect when examining the Site and the Employer's Requirements before submitting the Tender, the Time for Completion shall not be extended and the Contract Price shall not be adjusted

5.2

Contractor's Documents

The Contractor's Documents shall comprise the technical documents specified in the Employer's Requirements, documents required to satisfy all regulatory approvals and documents described in Sub-Clause 5.6 *[As-Built Documents]* and Sub-Clause 5.7 *[Operation and Maintenance Manuals]*. Unless otherwise stated in the Employer's Requirements, the Contractor's Documents shall be written in the language for communications defined in Sub-Clause 1.4 *[Law and Language]*

The Contractor shall prepare all Contractor's Documents, and shall also prepare any other documents necessary to instruct the Contractor's Personnel. The Employer's Personnel shall have the right to inspect the preparation of all these documents, wherever they are being prepared.

If the Employer's Requirements describe the Contractor's Documents which are to be submitted to the Engineer for review and/or for approval, they shall be submitted accordingly, together with a notice as described below. In the following provisions of this Sub-Clause, (i) "review period" means the period required by the Engineer for review and (if so specified) for approval, and (ii) "Contractor's Documents" exclude any documents which are not specified as being required to be submitted for review and/or for approval.

Unless otherwise stated in the Employer's Requirements, each review period shall not exceed 21 days, calculated from the date on which the Engineer receives a Contractor's Document and the Contractor's notice. This notice shall state that the Contractor's Document is considered ready, both for review (and approval, if so specified) in accordance with this Sub-Clause and for use. The notice shall also state that the Contractor's Document complies with the Contract, or the extent to which it does not comply.

The Engineer may, within the review period, give notice to the Contractor that a Contractor's Document fails (to the extent stated) to comply with the Contract. If a Contractor's Document so fails to comply, it shall be rectified, resubmitted and reviewed (and, if specified, approved) in accordance with this Sub-Clause at the Contractor's cost.

For each part of the Works, and except to the extent that the prior approval or consent of the Engineer shall have been obtained:

- (a) in the case of a Contractor's Document which has (as specified) been submitted for the Engineer's approval
 - (i) the Engineer shall give notice to the Contractor that the Contractor's Document is approved, with or without comments, or that it fails (to the extent stated) to comply with the Contract;
 - (ii) execution of such part of the Works shall not commence until the Engineer has approved the Contractor's Document; and
 - (iii) the Engineer shall be deemed to have approved the Contractor's Document upon the expiry of the review periods for all the Contractor's Documents which are relevant to the design and execution of such part unless the Engineer has previously notified otherwise in accordance with sub-paragraph (i);
- (b) execution of such part of the Works shall not commence prior to the expiry of the review periods for all the Contractor's Documents which are relevant to its design and execution;
- (c) execution of such part of the Works shall be in accordance with these reviewed (and, if specified, approved) Contractor's Documents' and
- (d) if the Contractor wishes to modify any design or document which has previously been submitted for review (and if specified approval) the Contractor shall immediately give notice to the Engineer. Thereafter the Contractor shall submit revised documents to the Engineer in accordance with the above procedure.

If the Engineer instructs that further Contractor's Documents are required the Contractor shall prepare them promptly.

Any such approval or consent, or any review (under this Sub-Clause or otherwise), shall not relieve the Contractor from any obligation or responsibility

5.3

Contractor's Undertaking The Contractor undertakes that the design, the Contractor's Documents, the execution and the completed Works will be in accordance with:

- (a) the Laws in the Country, and
- (b) the documents forming the Contract, as altered or modified by Variations.

5.4

Technical Standards and Regulations The design, the Contractor's Documents, the execution and the completed Works shall comply with the Country's technical standards, building, construction and environmental Laws, Laws applicable to the product being produced from the Works, and other standards specified In the Employer's Requirements, applicable to the Works, or defined by the applicable Laws.

All these Laws shall, In respect of the Works and each Section, be those prevailing when the Works or Section are taken over by the Employer under Clause 10 [*Employer's Taking Over*]. References In the Contract to published standards shall be understood to be references to the edition applicable on the Base Date, unless stated otherwise.

If changed or new applicable standards come into force In the Country after the Base Date, the Contractor shall give notice to the Engineer and (if appropriate) submit proposals for compliance. In the event that:

- (a) the Engineer determines that compliance is required, and
- (b) the proposals for compliance constitute a variation,

then the Engineer shall Initiate a Variation in accordance with Clause 13 [*Variations and Adjustments*].

5.5

Training The Contractor shall carry out the training of Employer's Personnel in the operation and maintenance of the Works to the extent specified in the Employer's Requirements. If the Contract specifies training which Is to be carried out before taking-over, the Works shall not be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [*Taking Over of the Works and Sections*] until this training has been completed.

5.6

As-Built Documents The Contractor shall prepare, and keep up-to-date, a complete set of "as-built" records of the execution of the Works showing the exact as-built locations sizes and details of the work as executed. These records shall be kept on the Site and shall be used exclusively for the purposes of this Sub-Clause. Two copies shall be supplied to the Engineer prior to the commencement of the Tests on Completion.

In addition, the Contractor shall supply to the Engineer as-built drawings of the Works showing all Works as executed, and submit them to the Engineer for review under Sub-Clause 5.2 [*Contractor's Documents*]. The Contractor shall obtain the consent of the Engineer as to their size, the referencing system, and other relevant details.

Prior to the issue of any Taking-Over Certificate, the Contractor shall supply to the Engineer the specified numbers and types of copies of the relevant as-built drawings, in accordance with the Employer's Requirements. The Works shall not be considered

to be completed for the purposes of taking-over under Sub-Clause 10.1 [*Taking Over of the Works and Sections*] until the Engineer has received these documents.

5,7

Operation and Maintenance Manuals

Prior to commencement of the Tests on Completion, the Contractor shall supply to the Engineer provisional operation and maintenance manuals in sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair the Plant.

The Works shall not be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [*Taking Over of the Works and Sections*] until the Engineer has received final operation and maintenance manuals in such detail, and any other manuals specified in the Employer's Requirements for these purposes.

5.8

Design Error

If errors, omissions, ambiguities, inconsistencies, inadequacies or other defects are found in the Contractor's Documents, they and the Works shall be corrected at the Contractor's cost, notwithstanding any consent or approval under this Clause

Staff and Labour

6.1

Engagement of Staff and Labour

Except as otherwise stated In the Employer's Requirements, the Contractor shall make arrangements for the engagement of all staff and labour, local or otherwise, and for their payment, housing, feeding and transport.

6.2

Rates of Wages and Conditions of Labour

The Contractor shall pay rates of wages, and observe conditions of labour, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.

6.3

Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labour from amongst the Employer's Personnel.

6.4

Labour Laws

The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health safety welfare, Immigration and emigration, and shall allow them all their legal rights.

The Contractor shall require his employees to obey all applicable Laws including those concerning safety at work.

6.5

Working Hours

No work shall be carried out on the Site on locally recognised days of rest or outside the normal working hours stated in the Appendix to Tender, unless:

- (a) otherwise stated in the Contract,
- (b) the Engineer gives consent or,
- (c) the work is unavoidable or necessary for the protection of life or property or the safety of the Works, in which case the Contractor shall immediately advise the Engineer.

**6.6
Facilities for Staff
and Labour**

Except as otherwise stated in the Employer's Requirements, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel as stated In the Employer's Requirements.

The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

6.7

**Health and Safety
health**

The Contractor shall at all times take all reasonable precautions to maintain the and safety of the Contractor's Personnel. In collaboration with local health authorities the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to Issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.

The Contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.

6.8

**Contractor's
Superintendence**

Throughout the design and execution of the Works, and as long thereafter as is necessary to fulfill the Contractor's obligations, the Contractor shall provide all necessary superintendence to plan, arrange, direct, manage, inspect and test the work.

Superintendence shall be given by a sufficient number of persons having adequate knowledge of the language for communications (defined in Sub-Clause 1.4 [*Law and Language*]) and of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents), for the satisfactory and safe execution of the Works.

6.9

**Contractor's
Personnel**

The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative if applicable, who:

- (a) persist in any misconduct or lack of care,
- (b) carries out duties incompetently or negligently,
- (c) fails to conform with any provisions of the Contract, or
- (d) persist in any conduct which is prejudicial to safety, health, or the protection of the environment.

If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.

6.10

Records of Contractor's Personnel and Equipment

The Contractor shall submit, to the Engineer, details showing the number of each class of Contractor's Personnel and of each type of Contractor's Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Engineer, until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.

6.11

Disorderly Conduct

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Contractor's Personnel, and to preserve peace and protection of persons and property on and near the Site.

Plant, Materials and Workmanship

7.1

Manner of Execution

The Contractor shall carry out the manufacture of Plant, the production and manufacture of Materials, and all other execution of the Works:

- (a) in the manner (If any) specified in the Contract,
- (b) in a proper workmanlike and careful manner, in accordance with recognised good practice, and
- (c) with properly equipped facilities and non-hazardous Materials, except as otherwise specified in the Contract.

7.2

Samples

The Contractor shall submit the following samples of Materials, and relevant information, to the Engineer for review in accordance with the procedures for Contractor's Documents described in Sub-Clause 5.2 [*Contractor's Documents*]:

- (a) manufacturer's standard samples of Materials and samples specified in the Contract, all at the Contractor's cost, and
- (b) additional samples instructed by the Engineer as a Variation.

Each sample shall be labelled as to origin and intended use In the Works.

7.3

Inspection

The Employer's Personnel shall at all reasonable times:

- (a) have full access to all parts of the Site and to all places from which natural Materials are being obtained, and
- (b) during production, manufacture and construction (at the Site and elsewhere) be entitled to examine, inspect, measure and test the materials and workmanship, and to check the' progress of manufacture of Plant and production and manufacture of Materials.

The Contractor shall give the Employer's Personnel full opportunity to carry out these activities, including providing access, facilities, permissions and safety equipment. No such activity shall relieve the Contractor from any obligation or responsibility.

The Contractor shall give notice to the Engineer whenever any work is ready and before its covered up, put out of sight, or packaged or storage or transport. The

Engineer shall then either carry out the examination, inspection, measurement or testing without unreasonable delay, or promptly give notice to the Contractor that the Engineer does not require to do so. If the Contractor fails to give the notice, he shall, if and when required by the Engineer, uncover the work and thereafter reinstate and make good, all at the Contractor's cost.

7.4

Testing

This Sub-Clause shall apply to all tests specified in the Contract, other than the Tests after Completion (if any).

The Contractor shall provide all apparatus, assistance, documents and other information, electricity, equipment, fuel, consumables, instruments, labour, materials and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently. The Contractor shall agree, with the Engineer, the time and place for the specified testing of any Plant, Materials and other parts of the Works.

The Engineer may, under Clause 13 [*Variations and Adjustments*], vary the location or details of specified tests, or instruct the Contractor to carry out additional tests. If these varied or additional tests show that the tested Plant, Materials or workmanship is not in accordance with the Contract, the cost of carrying out this Variation shall be borne by the Contractor, notwithstanding other provisions of the Contract.

The Engineer shall give the Contractor not less than 24 hours' notice of the Engineer's intention to attend the tests. If the Engineer does not attend at the time and place agreed, the Contractor may proceed with the tests, unless otherwise instructed by the Engineer, and the tests shall then be deemed to have been made in the Engineer's presence.

If the Contractor suffers delay and/or Incurs Cost from complying with these instructions or as a result of a delay for which the Employer is responsible, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters

The Contractor shall promptly forward to the Engineer duly certified reports of the tests. When the specified tests have been passed the Engineer shall endorse the Contractor's test certificate, or issue a certificate to him, to that effect. If the Engineer has not attended the tests, he shall be deemed to have accepted the readings as accurate.

7.5

Rejection

If, as a result of an examination, inspection, measurement or testing, any Plant, Materials, design or workmanship is found to be defective or otherwise not in accordance with the Contract, the Engineer may reject the Plant, materials, design or workmanship by giving notice to the Contractor, with reasons. The contractor shall then promptly make good the defect and ensure that the rejected item complies with the Contract

If the Engineer requires this Plant, Materials, design or workmanship to be retested, the test shall be repeated under the same terms and conditions. If the rejection and

retesting cause the Employer to Incur additional costs, the Contractor shall subject to Sub-Clause 2.5 [*Employer's Claims*], pay these costs to the Employer.

7.6

Remedial Work

Notwithstanding any previous test or certification, the Engineer may instruct the Contractor to:

- (a) remove from the Site and replace any Plant or Materials which is not in accordance with the Contract,
- (b) remove and re-execute any other work which is not in accordance with the Contract, and
- (c) execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseeable event or otherwise.

The Contractor shall comply with the instruction within a reasonable time, which shall be the time (If any) specified in the instruction, or immediately If urgency is specified under sub-paragraph (c).

If the Contractor fails to comply with the instruction, the Employer shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall subject to Sub-Clause 2.5 [*Employer's Claims*] pay to the Employer all costs arising from this failure.

7.7

Ownership of Plant and Materials

Each Item of Plant and Materials shall, to the extent consistent with the Laws of the Country, become the property of the Employer at whichever is the earlier of the following times, free from liens and other encumbrances:

- (a) when it is delivered to the Site;
- (b) when the Contractor is entitled to payment of the value of the Plant and Materials under Sub-Clause 8.10 [*Payment for Plant and Materials in Event of Suspension*].

7.8

Royalties

Unless otherwise stated in the Employer's Requirements, the Contractor shall pay all royalties, rents and other payments for:

- (a) natural Materials obtained from outside the Site, and
 - (b) the disposal of material from demolitions and excavations and of other surplus material (whether natural or man-made), except to the extent that disposal areas within the Site are specified in the Contract.
-

Commencement, Delays and Suspension

8.1

Commencement of Work

The Engineer shall give the Contractor not less than 7 days' notice of the Commencement Date. Unless otherwise stated In the Particular Conditions, the Commencement Date shall be within 42 days after the Contractor receives the Letter of Acceptance.

The Contractor shall commence the design and execution of the Works as soon as is reasonably practicable after Commencement date, and shall then proceed with the Works with due expedition and without delay.

8.2

Time for Completion

The Contractor shall complete the whole of the Works, and each Section (if any), within the Time for Completion for the Work or Section (as the case may be), including:

- (a) achieving the passing of the Tests on completion, and
- (b) completing all work which is stated in the Contract as being required for the Works or Section to be considered to be completed for the purposes of taking-over under Sub- Clause 10.1 [*Taking Over of the Works and Sections*].

8.3

Programme

The Contractor shall submit a detailed time programme to the Engineer within 28 days after receiving the notice under Sub-Clause 8.1 [*Commencement of Works*]. The Contractor shall also submit a revised programme whenever the previous programme is inconsistent with actual progress or with the Contractor's obligations. Each programme shall include:

- (a) the order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design, Contractor's Documents, procurement, manufacture, inspection, delivery to Site, construction erection, testing, commissioning and trial operation,
- (b) the periods for reviews under Sub-Clause 5.2 [*Contractor's Documents*] and for any other submissions, approvals and consents specified in the Employer's Requirements,
- (c) the sequence and timing of inspections and tests specified in the Contract, and
- (d) a supporting report which includes:
 - (i) a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and
 - (ii) details showing the Contractor's reasonable estimate of the number of each class of Contractor's Personnel and of each type of Contractor's Equipment, required on the Site for each major stage.

Unless the Engineer, within 21 days after receiving a programme gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Employer's Personnel shall be entitled to rely upon the programme when planning their activities

The Contractor shall promptly give notice to the Engineer of specific probable future events or circumstances which may adversely affect the work increase the Contract Price or delay the execution of the Works. The Engineer may require the Contractor to submit an estimate of the anticipated effect of the future event or circumstances and/or a proposal under Sub-Clause 13.3 [*Variation Procedure*]

If, at any time, the Engineer gives notice to the Contractor that a programme fails (to the extent stated) to comply the Contract or to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a revised programme to the Engineer in accordance with this Sub- Clause.

8.4

Extension of Time for Completion

The Contractor shall be entitled subject to Sub- Clause 20.1 [*Contractor's Claims*] to an extension of the Time for Completion if and to the extent that completion for the

purposes of Sub-Clause 10.1 [*Taking Over of the Works and Sections*] Is or will be delayed by any of the following causes:

- (a) a Variation (unless an adjustment to the Time for Completion has been agreed under Sub-Clause 13.3 [*Variation Procedure*]),
- (b) a cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions,
- (c) exceptionally adverse climatic conditions,
- (d) Unforeseeable shortages in the availability of personnel or Goods caused by epidemic or governmental actions, or
- (e) any delay, Impediment or prevention caused by or attributable to the Employer, the Employer's Personnel, or the Employer's other contractors on the Site.

If the Contractor considers himself to be entitled to an extension of the Time for Completion, the Contractor shall give notice to the Engineer in accordance with Sub-Clause 20.1 [*Contractor's Claims*]. When determining each extension of time under Sub-Clause 20.1, the Engineer shall review previous determinations and may increase, but shall not decrease, the total extension of time.

8.5

Delays Caused by Authorities

If the following conditions apply, namely:

- (a) the Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities in the Country,
- (b) these authorities delay or disrupt the Contractor's work, and
- (c) the delay or disruption was Unforeseeable,

then this delay or disruption will be considered as a cause of delay under subparagraph (b) of Sub-Clause 8.4 [*Extension of Time for Completion*].

8.6

Rate of Progress

If, at any time:

- (a) actual progress is too slow to complete within the Time for Completion and/or
- (b) progress has fallen (or will fall) behind the current programme under Sub-Clause 8.3 [*Programme*],

other than as a result of a cause listed in Sub-Clause 8.4 [*Extension of Time for Completion*], then the Engineer may instruct the Contractor to submit under Sub-Clause 8.3 [*Programme*], a revised programme and supporting report describing the revised methods which the Contractor proposes to adopt in order to expedite progress and complete within the Time for Completion.

Unless the Engineer notifies otherwise, the Contractor shall adopt these revised methods, which may require increases in the working hours and/or in the numbers of Contractor's Personnel and/or Goods, at the risk and cost of the Contractor. If these revised methods cause the Employer to incur additional costs, the Contractor shall subject to Sub-Clause 2.5 [*Employer's Claims*] pay these costs to the Employer, in addition to delay damages (if any) under Sub-Clause 8.7 below.

8.7

Delay Damages

If the Contractor fails to comply with Sub-Clause 8.2 [*Time for Completion*], the Contractor shall subject to Sub-Clause 2.5 [*Employer's Claims*] pay delay damages to the Employer for this default. These delay damages shall be the sum stated in the Appendix to Tender, which shall be paid for every day which shall elapse between the

relevant Time for Completion and the date stated in the Taking-Over Certificate. However, the total amount due under this Sub-Clause shall not exceed the maximum amount of delay damages (if any) stated in the Appendix to Tender.

These delay damages shall be the only damages due from the Contractor for such default, other than In the event of termination under Sub-Clause 15.2 [*Termination by Employer*] prior to completion of the Works. These damages shall not relieve the Contractor from his obligation to complete the Works, or from any other duties, obligations or responsibilities which he may have under the Contract.

8.8

Suspension of Work

The Engineer may at any time instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage.

The Engineer may also notify the cause for the suspension. If and to the extent that the cause is notified and is the responsibility of the Contractor, the following Sub-Clause 8.9, 8.10 and 8.11 shall not apply.

8.9

Consequences of Suspension

If the Contractor suffers delay and/or incurs Cost from complying with the Engineer's instructions under Sub-Clause 8.8 [*Suspension of Work*] and/or from resuming the work, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such Cost, which shall be included In the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

The Contractor shall not be entitled to an extension of time for, or to payment of the Cost incurred in, making good the consequences of the Contractor's faulty design workmanship or materials, or of the Contractor's failure to protect, store or secure in accordance with Sub-Clause 8.8 [*Suspension of Work*].

8.10

Payment for Plant and Materials in Event of Suspension

The Contractor shall be entitled to payment of the value (as at the date of suspension) of Plant and/or Materials which have not been delivered to Site, if:

- (a) the work on Plant or delivery of Plant and/or Materials has been suspended for more than 28 days, and
- (b) the Contractor has marked the Plant and/or Materials as the Employer's property in accordance with the Engineer's instructions.

8.11

Prolonged Suspension

If the suspension under Sub-Clause 8.8 [*Suspension of Work*] has continued for more than 84 days, the Contractor may request the Engineer's permission to proceed. If the Engineer does not give permission within 28 days after being requested to do so, the Contractor may, by giving notice to the Engineer, treat the suspension as an omission under Clause 13 [*Variations and Adjustments*] of the affected part of the Works. If the suspension affects the whole of the Works, the Contractor may give notice of termination under Sub-Clause 16.2 [*Termination by Contractor*].

**8.12
Resumption of Work**

After the permission or instruction to proceed is given, the Contractor and the Engineer shall jointly examine the Works and the Plant and Materials affected by the suspension. The Contractor shall make good any deterioration or defect in or loss of the Works or Plant or Materials, which has occurred during the suspension.

Tests on Completion

9.1

Contractor's Obligations

The Contractor shall carry out the Tests on Completion in accordance with this Clause and Sub-Clause 7.4 [*Testing*], after providing the documents in accordance with Sub-Clause 5.6 [*As-Built Documents*] and Sub-Clause 5.7 [*Operation and Maintenance Manuals*].

The Contractor shall give to the Engineer not less than 21 days' notice of the date after which the Contractor will be ready to carry out each of the Tests on Completion. Unless otherwise agreed, Tests on Completion shall be carried out within 14 days after this date, on such day or days as the Engineer shall instruct.

Unless otherwise stated in the Particular Conditions, the Tests on Completion shall be carried out in the following sequence:

- (a) pre-commissioning tests, which shall include the appropriate inspections and ("dry" or "cold") functional tests to demonstrate that each item of Plant can safely undertake the next stage, (b);
- (b) commissioning tests, which shall include the specified operational tests to demonstrate that the Works or Section can be operated safely and as specified, under all available operating conditions; and
- (c) trial operation, which shall demonstrate that the Works or Section perform reliably and in accordance with the Contract.

During trial operation, when the Works are operating under stable conditions, the Contractor shall give notice to the Engineer that the Works are ready for any other Tests on Completion, including performance tests to demonstrate whether the Works conform with criteria specified in the Employer's Requirements and with the Schedule of Guarantees.

Trial operation shall not constitute a taking-over under Clause 10 [*Employer's Taking Over*]. Unless otherwise stated in the Particular Conditions, any product produced by the Works during trial operation shall be the property of the Employer.

In considering the results of the Tests on Completion, the Engineer shall make allowances for the effect of any use of the Works by the Employer on the performance or the characteristics of the Works. As soon as the Works, or a Section have passed each of the Tests on Completion described in sub-paragraph (a) (b) or (c), the Contractor shall submit a certified report of the results of these Tests to the Engineer.

9.2

Delayed Tests

If the Tests on Completion are being unduly delayed by the Employer Sub-Clause 7.4 [*Testing*] (fifth paragraph) and/or Sub-Clause 10.3 [*Interference with Tests on Completion*] shall be applicable.

If Tests on Completion are being unduly delayed by Contractor, the Engineer may by notice require the Contractor to carry out the Tests within 21 days after receiving the notice. The Contractor shall carry out the Tests on such day or days

within that period as the Contractor may fix and of which he shall give notice to the Engineer.

If the Contractor fails to carry out the Tests on Completion within the period of 21 days, the Employer's Personnel may proceed with the Tests at the risk and cost of the Contractor. The Tests on Completion shall then be deemed to have been carried out in the presence of the Contractor and the results of the Tests shall be accepted as accurate.

9.3

Retesting

If the Works, or a Section, fail to pass the Tests on Completion, Sub-Clause 7.5 [*Rejection*] shall apply, and the Engineer or the Contractor may require the failed Tests, and Tests on Completion on any related work, to be repeated under the same terms and conditions.

9.4

Failure to Pass Tests on Completion

If the Works, or a Section, fail to pass the Tests on Completion repeated under Sub-Clause 9.3 [*Retesting*], the Engineer shall be entitled to:

- (a) order further repetition of Tests on Completion under Sub-Clause 9.3;
- (b) if the failure deprives the Employer of substantially the whole benefit of the Works or Section, reject the Works or Section (as the case may be), in which event the Employer shall have the same remedies as are provided in sub-paragraph (c) of Sub-Clause 11.4 [*Failure to Remedy Defects*]; or
- (c) issue a Taking-Over Certificate, if the Employer so requests.

In the event of sub-paragraph (c), the Contractor shall then proceed in accordance with all other obligations under the Contract, and the Contract Price shall be reduced by such amount as shall be appropriate to cover the reduced value to the Employer as a result of this failure. Unless the relevant reduction for this failure is stated (or its method of calculation is defined) in the Contract, the Employer may require the reduction to be (i) agreed by both Parties (in full satisfaction of this failure only) and paid before this Taking-Over Certificate is issued, or (ii) determined and paid under Sub-Clause 2.5 [*Employer's Claims*] and Sub-Clause 3.5 [*Determinations*].

Employer's Taking Over

10.1

Taking Over of the Works and Sections

Except as stated in Sub-Clause 9.4 [*Failure to Pass Tests on Completion*] the Works shall be taken over by the Employer when (i) the Works have been completed in accordance with the Contract, including the matters described in Sub-Clause 8.2 [*Time for Completion*] and except as allowed in sub-paragraph (a) below and (ii) a Taking-Over Certificate for the Works has been issued, or is deemed to have been issued in accordance with this Sub-Clause.

The Contractor may apply by notice to the Engineer for a Taking-Over Certificate not earlier than 14 days before the Works will, in the Contractor's opinion be complete and ready for taking over. If the Works are divided into Sections the Contractor may similarly apply for a Taking-Over Certificate for each Section.

Engineer shall, within 28 days after receiving the Contractor's application:

- (a) issue the Taking-Over Certificate to the Contractor stating the date on which the Works or Section were completed in accordance with the Contract, except

for any minor outstanding work and defects which will not substantially affect the use of the Works or Section for their intended purpose (either until or whilst this work is completed and these defects are remedied); or

- (b) reject the application, giving reasons and specifying the work required to be done by the Contractor to enable the Taking-Over Certificate to be Issued. The Contractor shall then complete this work before issuing a further notice under this Sub-Clause.

If the Engineer fails either to issue the Taking-Over Certificate or to reject the Contractor's application within the period of 28 days, and If the Works or Section (as the case may be) are substantially in accordance with the Contract, the Taking-Over Certificate shall be deemed to have been issued on the last day of that period.

10.2

Taking Over of Parts of the Works

The Engineer may, at the sole discretion of the Employer, issue a Taking-Over Certificate for any part of the Permanent Works.

The Employer shall not use any part of the Works (other than as a temporary measure which is either specified in the Contract or agreed by both Parties) unless and until the Engineer has issued a Taking-Over Certificate for this part. However, if the Employer does use any part of the Works before the Taking-Over Certificate is issued:

- (a) the part which is used shall be deemed to have been taken over as from the date on which it is used,
- (b) the Contractor shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the Employer, and
- (c) if requested by the Contractor, the Engineer shall issue a Taking-Over Certificate for this part.

After the Engineer has issued a Taking-Over Certificate for a part of the Works, the Contractor shall be given the earliest opportunity to take such steps as may be necessary to carry out any outstanding Tests on Completion. The Contractor shall carry out these Tests on Completion as soon as practicable before the expiry date of the relevant Defects Notification Period.

If the Contractor incurs Cost as a result of the Employer taking over and/or using a part of the Works, other than such use as is specified in the Contract or agreed by the Contractor, the Contractor shall (i) give notice to the Engineer and (ii) be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to payment of any such Cost plus reasonable profit, which shall be included In the Contract Price After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine this Cost and profit.

If a Taking-Over Certificate has been issued for a part of the Works (other than a Section), the delay damages thereafter for completion of the remainder of the Works shall be reduced. Similarly, the delay damages for the remainder of the Section (if any) in which this part is included shall also be reduced For any period of delay after the date stated in this Taking- Over Certificate, the proportional reduction in these delay damages shall be calculated as the proportion which the value of the part so certified bears to the value of the Works or Section (as the case may be) as a whole. The Engineer shall proceed in accordance with Sub- Clause 3.5 [*Determinations*] to agree or determine these proportions. The provisions of this paragraph shall only apply to the daily rate of delay damages under Sub- Clause 8.7 (Delay Damages), and shall not affect the maximum amount of these damages.

**10.3
Interference with Tests**

If the Contractor is prevented, for more than 14 days, from carrying out the Tests on Completion by a cause for which the Employer is responsible, the Employer shall be deemed to have taken over the Works or Section (as the case may be) on the date when the Tests on Completion would otherwise have been completed.

The Engineer shall then Issue a Taking-Over Certificate accordingly, and the Contractor shall carry out the Tests on Completion as soon as practicable, before the expiry date of the Defects Notification Period. The Engineer shall require the Tests on Completion to be carried out by giving 14 days' notice and in accordance with the relevant provisions of the Contract.

If the Contractor suffers delay and/or Incurs Cost as a result of this delay in carrying out the Tests on Completion, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

**10.4
Surfaces Requiring Reinstatement**

Except as otherwise stated in a taking- Over Certificate, a certificate for a Section or part of the Works shall not be deemed to certify completion of any ground or other surfaces requiring reinstatement.

Defects Liability

**11.1
Completion of Outstanding Work and Remediating Defects**

In order that the Works and Contractor's Documents, and each Section shall be in the condition required by the Contract (fair wear and tear excepted) by the expiry date of the relevant Defects Notification Period or as soon as practicable thereafter, the Contractor shall:

- (a) complete any work which is outstanding on the date stated in a Taking- Over Certificate, within such reasonable time as is instructed by the Engineer, and
- (b) execute all work required to remedy defects or damage, as may be notified by (or on behalf of) the Employer on or before the expiry date of the Defects Notification Period for the Works or Section (as the case may be).

If a defect appears or damage occurs the Contractor shall be notified accordingly, by (or on behalf of) the Employer.

**11.2
Cost of Remediating Defects**

All work referred to in sub-paragraph (b) of Sub-Clause 11.1 [*Completion of Outstanding Work and Remediating Defects*] shall be executed at the risk and cost of the Contractor, if and to the extent that work is attributable to:

- (a) the design of the Works other than a part of the design for which the Employer is responsible (if any)
- (b) Plant, Materials or workmanship not being in accordance with the Contract,

- (c) improper operation or maintenance which was attributable to matters for which the Contractor is responsible (under Sub-Clauses 5.5 to 5.7 or otherwise), or
- (d) failure by the Contractor to comply with any other obligation.

If and to the extent that such work is attributable to any other cause, the Contractor shall be notified promptly by (or on behalf of) the Employer, and Sub-Clause 13.3 [*Variation Procedure*] shall apply.

11.3

Extension of Defects Notification Period

The Employer shall be entitled subject to Sub-Clause 2.5 [*Employer's Claims*] to an extension of the Defects Notification Period for the Works or a Section If and to the extent that the Works, Section or a major Item of Plant (as the case may be, and after taking over) cannot be used for the purposes for which they are Intended by reason of a defect or damage. However, a Defects Notification Period shall not be extended by more than two years.

If delivery and/or erection of Plant and/or Materials was suspended under Sub-Clause 8.8 [*Suspension of Work*] or Sub-Clause 16.1 [*Contractor's Entitlement to Suspend Work*], the Contractor's obligations under this Clause shall not apply to any defects or damage occurring more than two years after the Defects Notification Period for the Plant and/or Materials would otherwise have expired.

11.4

Failure to Remedy Defects

If the Contractor fails to remedy any defect or damage within a reasonable time, a date may be fixed by (or on behalf of) the Employer, on or by which the defect or damage is to be remedied. The Contractor shall be given reasonable notice of this date.

If the Contractor fails to remedy the defect or damage by this notified date and this remedial work was to be executed at the cost of the Contractor under Sub-Clause 11.2 [*Cost of Remedying Defects*], the Employer may (at his option):

- (a) carry out the work himself or by others, in a reasonable manner and at the Contractor's cost, but the Contractor shall have no responsibility for this work; and the Contractor shall subject to Sub-Clause 2.5 [*Employer's Claims*] pay to the Employer the costs reasonably Incurred by the Employer In remedying the defect or damage;
- (b) require the Engineer to agree or determine a reasonable reduction in the Contract Price in accordance with Sub-Clause 3.5 [*Determinations*]; or
- (c) if the defect or damage deprives the Employer of substantially the whole benefit of the Works or any major part of the Works terminate the Contract as a whole, or in respect of such major part which cannot be put to the intended use. Without prejudice to any other rights, under the Contract or otherwise, the Employer shall then be entitled to recover all sums paid for the Works or for such part (as the case may be), plus financing costs and the cost of dismantling the same, clearing the Site and returning Plant and Materials to the Contractor.

11.5

Removal of Defective Work

If the defect or damage cannot be remedied expeditiously on the site and the Employer gives consent, the Contractor may remove from the Site for the purposes of repair such items of Plant, as are defective or damaged. This consent may require the Contractor to increase the amount of the Performance Security by the full replacement cost of these items, or to provide other appropriate security.

11.6

Futher Tests

If the work of remedying of any defect or damage may affect the performance of the Works, the Engineer may require the repetition of any the tests described in the

Contract, including Tests on Completion and/or Tests after Completion. The requirement shall be made by notice within 28 days after the defect or damage is remedied.

These tests shall be carried out in accordance with the terms applicable to the previous tests, except that they shall be carried out at the risk and cost of the Party liable, under Sub-Clause 11.2 [*Cost of Remedying Defects*], for the cost of the remedial work.

11.7**Right of Access**

Until the Performance Certificate has been issued, the Contractor shall have the right of access to all parts of the Works and to records of the operation and performance of the Works, except as may be Inconsistent with the Employer's reasonable security restrictions.

11.8**Contractor to Search**

The Contractor shall, If required by the Engineer, search for the cause of any defect under the direction of the Engineer. Unless the defect is to be remedied at the cost of the Contractor under Sub-Clause 11.2 [*Cost of Remedying Defects*], the Cost of the search plus reasonable profit shall be agreed or determined by the Engineer in accordance with Sub-Clause 3.5 [*Determinations*] and shall be included in the Contract Price.

11.9**Performance certificate**

Performance of the Contractor's obligations shall not be considered to have been Completed until the Engineer has issued the Performance Certificate to the Contractor, stating the date on which the Contractor completed his obligations under the Contract.

The Engineer shall issue the Performance Certificate within 28 days after the latest of the expiry dates of the Defects Notification Periods, or as soon thereafter as the Contractor has supplied all the Contractor's Documents and completed and tested all the Works, including remedying any defects. A copy of the Performance Certificate shall be issued to the Employer.

Only the Performance Certificate shall be deemed to constitute acceptance of the Works.

11.10**Unfulfilled Obligations**

After the Performance Certificate has been issued, each Party shall remain liable for the fulfillment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of unperformed obligations, the Contract shall be deemed to remain in force.

11.11**Clearance of Site**

Upon receiving the Performance Certificate the Contractor shall remove any remaining Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works from the Site.

If all these items have not been removed within 28 days after the Employer receive a copy of the Performance Certificate, the Employer may sell or otherwise dispose of any remaining items. The employer shall be entitled to be paid the cost incurred in connection with, or attributable to, such sale or disposal and restoring the Site.

Any balance of the moneys from the sale shall be paid to the Contractor. If these moneys are less than the Employer's costs, the Contractor shall pay the outstanding balance to the Employer.

Test after Completion

12.1

Procedure for Tests after Completion

If Tests after Completion are specified in the Contract, this Clause shall apply. Unless otherwise stated in the Particular Conditions, the Employer shall:

- (a) provide all electricity, equipment, fuel, instruments, labour, materials, and suitably qualified and experienced staff, as are necessary to carry out the Tests after Completion efficiently, and
- (b) carry out the Tests after Completion in accordance with the manuals supplied by the Contractor under Sub-Clause 5.7 [*Operation and Maintenance Manuals*] and such guidance as the Contractor may be required to give during the course of these Tests; and in the presence of such Contractor's Personnel as either Party may reasonably request.

The Tests after Completion shall be carried out as soon as is reasonably practicable after the Works or Section have been taken over by the Employer. The Employer shall give to the Contractor 21 days' notice of the date after which the Tests after Completion will be carried out. Unless otherwise agreed, these Tests shall be carried out within 14 days after this date, on the day or days determined by the Employer.

If the Contractor does not attend at the time and place agreed, the Employer may proceed with the Tests after Completion, which shall be deemed to have been made in the Contractor's presence, and the Contractor shall accept the readings as accurate.

The results of the Tests after Completion shall be compiled and evaluated by both Parties. Appropriate account shall be taken of the effect of the Employer's prior use of the Works.

12.2

Delayed Tests

If the Contractor incurs Cost as a result of any unreasonable delay by the Employer to the Tests after Completion, the Contractor shall (i) give notice to the Engineer and (ii) be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine this Cost and profit.

If, for reasons not attributable to the Contractor, a Test after Completion on the Works or any Section cannot be completed during the Defects Notification Period (or any other period agreed upon by both Parties), then the Works or Section shall be deemed to have passed this Test after Completion.

12.3

Retesting

If the Works, or a Section, fail to pass the Tests after Completion:

- (a) sub-paragraph (b) of Sub-Clause 11.1 [*Completion of Outstanding Work and Remedying Defects*] shall apply, and
- (b) either Party may then require the failed Tests and the Tests after Completion on any related work, to be repeated under the same terms and conditions.

If and to the extent that this failure and retesting are attributable to any of the matters listed in sub- paragraphs (a) to (d) of Sub- Clause 11.2 [*Cost of remedying Defects*]

and cause the Employer to incur additional costs, the Contractor shall subject to Sub-Clause 2.5 [*Employer's Claims*] pay these costs to the Employer.

12.4

Failure to Pass Tests After Completion

If the following conditions apply, namely:

- (a) the Works, or a Section, fail to pass any or all of the Tests after Completion,
- (b) the relevant sum payable as non-performance damages for this failure is stated (or its method of calculation is defined) in the Contract, and
- (c) The Contractor pays this relevant sum to the Employer during the Defects Notification Period,

then the Works or Section shall be deemed to have passed these Tests after Completion.

If the Works, or a Section, fail to pass a Test after Completion and the Contractor proposes to make adjustments or modifications to the Works or such Section, the Contractor may be instructed by (or on behalf of) the Employer that right of access to the Works or Section cannot be given until a time that is convenient to the Employer. The Contractor shall then remain liable to carry out the adjustments or modifications and to satisfy this Test, within a reasonable period of receiving notice by (or on behalf of) the Employer of the time that is convenient to the Employer. However, if the Contractor does not receive this notice during the relevant Defects Notification Period, the Contractor shall be relieved of this obligation and the Works or Section (as the case may be) shall be deemed to have passed this Test after Completion.

If the Contractor incurs additional Cost as a result of any unreasonable delay by the Employer in permitting access to the Works or Plant by the Contractor, either to investigate the causes of a failure to pass a Test after Completion or to carry out any adjustments or modifications, the Contractor shall (i) give notice to the Engineer and (ii) be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to payment of any such Cost plus reasonable profit, which shall be Included in the Contract Price

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine this Cost and profit.

Variations and Adjustments

13.1

Right to Vary

Variations may be Initiated by the Engineer at any time prior to issuing the Taking- Over Certificate for the Works, either by an instruction or by a request for the Contractor to submit a proposal. A Variation shall not comprise the omission of any work which is to be carried out by others.

The Contractor shall execute and be bound by each Variation unless the Contractor promptly gives notice to the Engineer stating (with supporting particulars) that (i) the Contractor cannot readily obtain the Goods required for the Variation, (ii) it will reduce the the safety or suitability of the Works, or (iii) it will have an adverse impact on the achievement of the Schedule of Guarantees. Upon receiving this notice, the Engineer shall cancel, confirm or vary the instruction.

13.2

Value Engineering

The Contractor may at any time, submit to the Engineer a written proposal which (in the Contractor's opinion) will, if adopted, (i) accelerate completion, (ii) reduce the cost

to the Employer of executing, maintaining or operating the Works, (iii) improve the efficiency or value to the Employer of the completed Works, or (iv) otherwise be of benefit to the Employer.

The proposal shall be prepared at the cost of the Contractor and shall include the items listed in Sub-Clause 13.3 [*Variation Procedure*].

13.3

Variation Procedure

If the Engineer requests a proposal, prior to instructing a Variation, the Contractor shall respond in writing as soon as practicable, either by giving reasons why he cannot comply (If this is the case) or by submitting:

- (a) a description of the proposed design and/or work to be performed and a programme for its execution,
- (b) the Contractor's proposal for any necessary modifications to the programme according to Sub-Clause 8.3 [*Programme*] and to the Time for Completion, and
- (c) the Contractor's proposal for adjustment to the Contract Price.

The Engineer shall, as soon as practicable after receiving such proposal (under Sub-Clause 13.2 [*Value Engineering*] or otherwise), respond with approval, disapproval or comments. The Contractor shall not delay any work whilst awaiting a response.

Each instruction to execute a Variation, with any requirements for the recording of Costs, shall be issued by the Engineer to the Contractor, who shall acknowledge receipt.

Upon instructing or approving a Variation, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine adjustments to the Contract Price and the Schedule of Payments. These adjustments shall include reasonable profit, and shall take account of the Contractor's submissions under Sub Clause 13.2 [*Value Engineering*] if applicable.

13.4

Payment in Applicable Currencies

If the Contract provides for payment of the Contract Price in more than one currency then whenever an adjustment is agreed, approved or determined as stated above the amount payable in each of the applicable currencies shall be specified. For this purpose, reference shall be made to the actual or expected currency proportions of the Cost of the varied work, and to the proportions of various currencies specified for payment of the Contract Price.

13.5

Provisional Sums

Each Provisional Sum shall only be used, in whole or in part in accordance with the Engineer's instructions, and the Contract Price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such amounts, for the work, supplies or services to which the Provisional Sum relates, as the Engineer shall have instructed. For each Provisional Sum, the Engineer may instruct:

- (a) work to be executed (including Plant, Materials or services to be supplied) by the Contractor and value under Sub-Clause 13.3 [*Variation Procedure*]; and/or
- (b) Plant, Materials or services to be purchased by the Contractor for which there shall be Included in the Contract Price:
 - (i) the actual amounts paid (or due to be paid) by the Contractor, and
 - (ii) a sum for overhead charges and profit, calculated as a percentage of these actual amounts by applying the relevant percentage rate (if any) stated in the appropriate Schedule. If there is no such rate, the percentage rate stated in the Appendix to Tender shall be applied.

The Contractor shall, when required by the Engineer, produce quotations, Invoices, vouchers and accounts or receipts in substantiation.

13.6
Daywork

For work of a minor or incidental nature, the Engineer may instruct that a Variation shall be executed on a daywork basis. The work shall then be valued in accordance with the daywork schedule Included in the Contract, and the following procedure shall apply. If a daywork schedule is not Included in the Contract, this Sub-Clause shall not apply.

Before ordering Goods for the work, the Contractor shall submit quotations to the Engineer. When applying for payment, the Contractor shall submit invoices, vouchers and accounts or receipts for any Goods.

Except for any items for which the daywork schedule specifies that payment is not due, the Contractor shall deliver each day to the Engineer accurate statements in duplicate which shall include the following details of the resources used in executing the previous day's work:

- (a) the names, occupations and time of Contractor's Personnel,
- (b) the identification, type and time of Contractor's Equipment and Temporary Works, and
- (c) the quantities and types of Plant and Materials used.

One copy of each statement will, if correct, or when agreed, be signed by the Engineer and returned to the Contractor. The Contractor shall then submit priced statements of these resources to the Engineer, prior to their Inclusion In the next Statement under Sub-Clause 14.3 [*Application for Interim Payment Certificates*].

13.7
Adjustments for
Changes in Legislation

The Contract Price shall be adjusted to take account of any increase or decrease in Cost resulting from a change in the Laws of the Country (including the introduction of new Laws and the repeal or modification of existing Laws) or in the judicial or official governmental interpretation of such Laws, made after the Base Date which affect the Contractor in the performance of obligations under the Contract.

If the Contractor suffers (or will suffer) delay and/or incurs (or will incur) additional Cost as a result of these changes In the Laws or in such interpretations made after the Base Date, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay if completion is or will be delayed under Sub-Clause 8.4 [*Extension of Time for Completion*] and
- (b) payment of any such Cost, which shall be included In the' Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub 3.5 [*Determinations*] to agree or determine these matters.

13.8
Adjustments for
Changes in Cost

In this Sub-Clause, "table of adjustment data" means the completed table of adjustment data included in the Appendix to tender. If there is no such table of adjustment data, this Sub- Clause shall not apply.

If this Sub-Clause applies, the amounts payable to the Contractor shall be adjusted for rises or falls in the cost of labour, Goods and other inputs to the Works, by the addition or deduction of the amounts determined by the formulae prescribed in this Sub-Clause. To the extent that full compensation for any rise or fall in Costs is not

covered by the provisions of this or other Clauses, the Accepted Contract Amount shall be deemed to have included amounts to cover the contingency of other rises and falls in costs.

The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, shall be determined from formulae for each of the currencies in which the Contract Price is payable. No adjustment is to be applied to work valued on the basis of Cost or current prices. The formulae shall be of the following general type:

$$P_n = a + b \frac{L_n}{L_o} + c \frac{E_n}{E_o} + d \frac{M_n}{M_o} + \dots$$

where:

"P_n" is the adjustment multiplier to be applied to the estimated contract value in the relevant currency of the work carried out in period "n", this period being a month unless otherwise stated in the Appendix to Tender;

"a" is a fixed coefficient, stated in the relevant table of adjustment data, representing the non-adjustable portion in contractual payments;

"b", "c", "d", ... are coefficients representing the estimated proportion of each cost element related to the execution of the Works, as stated in the relevant table of adjustment data; such tabulated cost elements may be indicative of resources such as labour, equipment and materials;

"L_n", "E_n", "M_n", ... are the current cost indices or reference prices for period "n", expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the date 49 days prior to the last day of the period (to which the particular Payment Certificate relates); and

"L_o", "E_o", "M_o", ... are the base cost indices or reference prices, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the Base Date.

The cost indices or reference prices stated in the table of adjustment data shall be used. If their source is in doubt, it shall be determined by the Engineer. For this purpose, reference shall be made to the values of the indices at stated dates (quoted in the fourth and fifth columns respectively of the table) for the purposes of clarification of the source; although these dates (and thus these values) may not correspond to the base cost indices.

In cases where the "currency of index" (stated in the table) is not the relevant currency of payment, each index shall be converted into the relevant currency of payment at the selling rate, established by the central bank of the Country, of this relevant currency on the above date for which the index is required to be applicable.

Until such time as each current cost index is available, the Engineer shall determine a provisional index for the issue of Interim Payment Certificates. When the index is available, the adjustment shall be recalculated accordingly.

If the Contractor fails to complete the Works within the Time for Completion, adjustment of prices thereafter shall be made using either (i) each index or price applicable on the date 49 days prior to the expiry of the Time for Completion of the Works, or (ii) the current index or price: whichever is more favourable to the Employer.

The weightings (coefficients) for each of the factors of cost stated in the table(s) of adjustment data shall only be adjusted if they have been rendered unreasonable, unbalanced or inapplicable, as a result of variations.

Contract Price and Payment

14.1

The contract Price

Unless otherwise stated in the Particular Conditions:

- (a) the Contract Price shall be the lump sum Accepted Contract Amount and be subject to adjustments in accordance with the Contract;
- (b) the Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract, and the Contract Price shall not be adjusted for any of these costs, except as stated in Sub-Clause 13.7 [*Adjustments for Changes in Legislation*];
- (c) any quantities which may be set out in a Schedule are estimated quantities and are not to be taken as the actual and correct quantities of the Works which the Contractor is required to execute; and
- (d) any quantities or price data which may be set out in a Schedule shall be used for the purposes stated in the Schedule and may be inapplicable for other purposes.

However, if any part of the Works is to be paid according to quantity supplied or work done, the provisions for measurement and evaluation shall be as stated in the Particular Conditions. The Contract Price shall be determined accordingly subject to adjustments in accordance with the Contract.

14.2

Advance Payment

The Employer shall make an advance payment, as an interest-free loan for mobilisation and design, when the Contractor submits a guarantee in accordance with this Sub-Clause. The total advance payment, the number and timing of instalments (if more than one), and the applicable currencies and proportions shall be as stated in the Appendix to Tender.

Unless and until the Employer receives this guarantee, or if the total advance payment is not stated in the Appendix to Tender, this Sub-Clause shall not apply.

The Engineer shall issue an Interim Payment Certificate for the first instalment after receiving a Statement (under Sub-Clause 14.3 [*Application for Interim Payment Certificates*]) and after the Employer receives (i) the Performance Security in accordance with Sub-Clause 4.2 [*Performance Security*] and (ii) a guarantee in amounts and currencies equal to the advance payment. This guarantee shall be issued by an entity and from within a country (or other jurisdiction) approved by the Employer, and shall be in the form annexed to the Particular Conditions or in another form approved by the Employer.

The Contractor shall ensure that the guarantee is valid and enforceable until the advance payment has been repaid, but its amount may be progressively reduced by the amount repaid by the Contractor as indicated in the Payment Certificates. If the terms of the guarantee specify its expiry date, and the advance payment has not been repaid by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the guarantee until the advance payment has been repaid.

The advance payment shall be repaid through percentage deductions in Payment Certificates. Unless other percentages are stated in the Appendix to Tender:

- (a) deductions shall commence in the Payment Certificate in which the total of all certified interim payments (excluding the advance payment and deductions and

repayments of retention) exceeds ten per cent (10%) of the Accepted Contract Amount less Provisional Sums; and

(b) deductions shall be made at the amortization rate of one quarter (25%) of the amount of each Payment Certificate (excluding the advance payment and deductions and repayments of retention) in the currencies and proportions of the advance payment, until such time as the advance payment has been repaid.

If the advance payment has not been repaid prior the issue of the Taking-Over Certificate for the Works or prior to termination under Clause 15 [*Termination by Employer*], Clause 16 [*Suspension and Termination by Contractor*] or Clause 19 [*Force Majeure*] (as the case may be), the whole of the balance then outstanding shall immediately become due and payable by the Contractor to the Employer.

14.3

Application for Interim Payment Certificates

The Contractor shall submit a Statement in six copies to the Engineer after the end of the period of payment stated in the Contract (if not stated, after the end of each month), in a form approved by the Engineer, showing in detail the amounts to which the Contractor considers himself to be entitled, together with supporting documents which shall include the relevant report on progress in accordance with Sub-Clause 4.21 [*Progress Reports*].

The Statement shall include the following items, as applicable, which shall be expressed in the various currencies in which the Contract Price is payable, in the sequence listed:

- (a) the estimated contract value of the works executed and the Contractor's Documents produced up to the end of the month (including Variations but excluding items described in sub-paragraphs (b) to (g) below);
- (b) any amounts to be added and deducted for changes in legislation and changes in cost, in accordance with Sub-Clause 13.7 [*Adjustment for Changes in Legislation*] and Sub-Clause 13.8 [*Adjustment for Changes in Cost*];
- (c) any amount to be deducted for retention, calculated by applying the percentage of retention stated in the Appendix to tender to the total of the above amounts, until the amount so retained by the Employer reaches the limit of Retention Money (if any) stated in the Appendix to Tender;
- (d) any amounts to be added and deducted for the advance payment and repayments in accordance with Sub-Clause 14.2 [*Advance Payment*];
- (e) any amounts to be added and deducted for Plant and Materials in accordance with Sub-Clause 14.5 [*Plant and Materials intended for the Works*];
- (f) any other additions or deductions which may have become due under the Contract or otherwise, including those under Clause 20 [*Claims, Disputes and Arbitration*]; and
- (g) the deduction of amounts certified in all previous Payment Certificates.

14.4

Schedule of Payments

If the Contract Includes a Schedule of Payments specifying the instalments in which Contract Price will be paid, then, unless otherwise stated in this Schedule:

- (a) the instalments quoted in the Schedule of Payments shall be the estimated contract values for the purposes of sub-paragraph (a) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*]
- (b) Sub-Clause 14.5 [*Plant and Materials intended for the Works*] shall not apply; and
- (c) if these instalments are not defined by reference to the actual progress achieved in executing the Works, and if actual progress is found to be less than

that on which the Schedule of Payments was based, then the Engineer may proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine revised instalments, which shall take account of the extent to which progress is less than that on which the instalments were previously based.

If the Contract does not include a Schedule of Payments, the Contractor shall submit non-binding estimates of the payments which he expects to become due during each quarterly period. The first estimate shall be submitted within 42 days after the Commencement Date. Revised estimates shall be submitted at quarterly intervals, until the Taking-Over Certificate has been issued for the Works.

14.5

Plant and Materials intended for the Works

If this Sub-Clause applies, Interim Payment Certificates shall include, under sub-paragraph (e) of Sub-Clause 14.3, (i) an amount for Plant and Materials which have been sent to the Site for incorporation in the Permanent Works, and (ii) a reduction when the contract value of such Plant and Materials is included as part of the Permanent Works under sub-paragraph (a) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*].

If the lists referred to in sub-paragraphs (b)(i) or (c)(i) below are not included in the Appendix to Tender, this Sub-Clause shall not apply.

The Engineer shall determine and certify each addition if the following conditions are satisfied:

- (a) the Contractor has:
 - (i) kept satisfactory records (Including the orders, receipts, Costs and use of Plant and Materials) which are available for Inspection, and
 - (ii) submitted a statement of the Cost of acquiring and delivering the Plant and Materials to the Site, supported by satisfactory evidence;and either:
- (b) the relevant Plant and Materials:
 - (i) are those listed in the Appendix to Tender for payment when shipped,
 - (ii) have been shipped to the Country, en route to the Site, in accordance with the Contract; and
 - (iii) are described in a clean shipped bill of lading or other evidence of shipment, which has been submitted to the Engineer together with evidence of payment of freight and insurance, any other documents reasonably required, and a bank guarantee in a form and issued by an entity approved by the Employer in amounts and currencies equal to the amount due under this Sub-Clause: this guarantee may be in a similar form to the form referred to in Sub-Clause 14.2 [*Advance Payment*] and shall be valid until the Plant and Materials are properly stored on Site and protected against loss, damage or deterioration;or
- (c) the relevant Plant and Materials:
 - (i) are those listed in the Appendix to Tender for payment when delivered to the Site, and
 - (ii) have been delivered to and are stored on the Site, are protected against loss, damage or deterioration, and appear to be in accordance with the Contract.

The additional amount to be certified shall be the equivalent of eighty percent of the Engineer's determination of the cost of the Plant and Materials (including delivery to Site), taking account of the documents mentioned in this Sub-Clause and of the contract value of the Plant and Materials.

The currencies for this additional amount shall be the same as those in which payment will become due when the contract value is included under sub-paragraph (a) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*]. At that time, the Payment Certificate shall include the applicable reduction which shall be equivalent to, and in the same currencies and proportions as, this additional amount for the relevant Plant and Materials.

14.6

Issue of Interim Payment Certificates

No amount will be certified or paid until the Employer has received and approved the Performance Security. Thereafter, the Engineer shall, within 28 days after receiving a Statement and supporting documents, issue to the Employer an Interim Payment Certificate which shall state the amount which the Engineer fairly determines to be due, with supporting particulars.

However, prior to issuing the Taking-Over Certificate for the Works, the Engineer shall not be bound to issue an Interim Payment Certificate in an amount which would (after retention and other deductions) be less than the minimum amount of Interim Payment Certificates (if any) stated in the Appendix to Tender. In this event the Engineer shall give notice to the Contractor accordingly.

An Interim Payment Certificate shall not be withheld for any other reason although:

- (a) if anything supplied or work done by the Contractor is not in accordance with the Contract, the cost of rectification or replacement may be withheld until rectification or replacement has been completed; and/or
- (b) if the Contractor was or is failing to perform any work or obligation in accordance with the Contract, and had been so notified by the Engineer, the value of this work or obligation may be withheld until the work or obligation has been performed.

The Engineer may in any Payment Certificate make any correction or modification that should properly be made to any previous Payment Certificate. A Payment Certificate shall not be deemed to indicate the Engineer's acceptance approval consent or satisfaction.

14.7

Payment

The Employer shall pay to the Contractor:

- (a) the first instalment of the advance payment within 42 days after issuing the Letter of Acceptance or within 21 days after receiving the documents in accordance with Sub-Clause 4.2 [*Performance Security*] and Sub-Clause 14.2 [*Advance Payment*], whichever is later;
- (b) the amount certified in each Interim Payment certificate within 56 days after the Engineer receives the Statement and supporting documents; and
- (c) the amount certified in the Final Payment Certificate within 56 days after the Employer receives this Payment Certificate

Payment of the amount due in each currency shall be made into bank account, nominated by the Contractor, in the payment country (for this currency) specified in the Contract.

14.8
[Payment],
Delayed payment

If the Contractor does not receive payment in accordance with Sub-Clause 14.7 the Contractor shall be entitled to receive financing charges compounded monthly on the amount unpaid during the period of delay. This period shall be deemed to commence on the date for payment specified in Sub-Clause 14.7 *[Payment]*, irrespective (in the case of its sub-paragraph (b)) of the date on which any Interim Payment Certificate is issued.

Unless otherwise stated in the Particular Conditions, these financing charges shall be calculated at the annual rate of three percentage points above the discount rate of the central bank in the country of the currency of payment, and shall be paid in such currency.

The Contractor shall be entitled to this payment without formal notice or certification and without prejudice to any other right or remedy

14.9

Payment of Retention Money

When the Taking-Over Certificate has been Issued for the Works, and the Works have passed all specified tests (including the Tests after Completion, if any), the first half of the

Retention Money shall be certified by the Engineer for payment to the Contractor. If a Taking-Over Certificate is issued for a Section, the relevant percentage of the first half of the Retention Money shall be certified and paid when the Section passes all tests. Promptly after the latest of the expiry dates of the Defects Notification Periods the outstanding balance of the Retention Money shall be certified by the Engineer for payment to the Contractor. If a Taking-Over Certificate was issued for a Section, the relevant percentage of the second half of the Retention Money shall be certified and paid promptly after the expiry date of the Defects Notification Period for the Section.

However, if any work remains to be executed under Clause 11 *[Defects Liability]* or Clause 12 *[Tests after Completion]*, the Engineer shall be entitled to withhold certification of the estimated cost of this work until it has been executed.

The relevant percentage for each Section shall be the percentage value of the Section as stated in the Appendix to Tender. If the percentage value of a Section is not stated in the Appendix to Tender, no percentage of either half of the Retention Money shall be released under this Sub-Clause in respect of such Section.

14.10

Statement at Completion

Within 84 days after receiving the Taking-Over Certificate for Works, the Contractor shall submit to the Engineer six copies of a Statement at completion with supporting documents, in accordance with Sub-Clause 14.3 *[Application for Payment Certificates]*, showing:

- (a) the value of all work done in accordance with the Contract up to the date stated in the Taking-Over Certificate for the Works,
- (b) any further sums which the Contractor considers to be due, and
- (c) an estimate of any other amounts which the Contractor considers will become due to him under the Contract. Estimated amounts shall be shown separately in this Statement at completion.

The Engineer shall then certify in accordance with Sub Clause 14.6 *[Issue of Interim Payment Certificates.]*

14.11

Application for Final Payment Certificate

Within 56 days after receiving the performance Certificate, the Contractor shall submit, to the Engineer, six copies of a draft final statement with support documents showing in details in a form approved by the Engineer:

- (a) the value of all work done In accordance with the Contract, and
- (b) any further sums which the Contractor considers to be due to him under the Contract or otherwise.

If the Engineer disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer may reasonably require and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer the final statement as agreed. This agreed statement is referred to in these Conditions as the "Final Statement".

However If, following discussions between the Engineer and the Contractor and any changes to the draft final statement which are agreed, it becomes evident that a dispute exists, the Engineer shall deliver to the Employer (with a copy to the Contractor) an Interim Payment Certificate for the agreed parts of the draft final statement. Thereafter, if the dispute is finally resolved under Sub-Clause 20.4 [*Obtaining Dispute Adjudication Board's Decision*] or Sub-Clause 20.5 [*Amicable Settlement*], the Contractor shall then prepare and submit to the Employer (with a copy to the Engineer) a Final Statement.

14.12

Discharge

When submitting the Final Statement, the Contractor shall submit a written discharge which confirms that the total of the Final Statement represents full and final settlement of all moneys due to the Contractor under or in connection with the Contract. This discharge may state that it becomes effective when the Contractor has received the Performance Security and the out-standing balance of this total in which event the discharge will be effective on such date.

14.13

issue of Final Payment Certificate

Within 28 days after receiving the Final Statement and written discharge in accordance with Sub-Clause 14.11 [*Application for Final Payment Certificate*] and Sub-Clause 14.12 [*Discharge*], the Engineer shall issue, to the Employer, the Final Payment Certificate which shall state:

- (a) the amount which is finally due, and
- (b) after giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled the balance (if any) due from the Employer to the Contractor or from the Contractor to the Employer, as the case may be.

If the Contractor has not applied for a Final Payment Certificate in accordance with Sub-Clause 14.11 [*Application for Final Payment Certificate*] and Sub-Clause 14.12 [*Discharge*], the Engineer shall request the Contractor to do so. If the Contractor fails to submit an application within a period of 28 days the Engineer shall issue the Final Payment Certificate for such amount as he fairly determines to be due

14.14

Cessation of Employer's Liability

The Employer shall not be liable to the Contractor for any matter or thing under or in connection with the Contract or execution of the Works, except to the extent that the Contractor shall have include an amount expressly for it:

- (a) in the Final Statement and also
- (b) (except for matters or things arising after the issue of the Taking-Over Certificate for the Works) in the Statement at completion described in Sub-Clause 14.10 [*Statement at Completion*].

However, this Sub-Clause shall not limit the Employer's liability under his indemnification obligations, or the Employer's liability in any case of fraud, deliberate default or reckless misconduct by the Employer.

14.15

Currencies of Payment

The Contract Price shall be paid in the currency or currencies named in the Appendix to Tender. Unless otherwise stated in the Particular Conditions, if more than one currency is so named, payments shall be made as follows:

- (a) if the Accepted Contract Amount was expressed in Local Currency only:
 - (i) the proportions or amounts of the Local and Foreign Currencies, and the fixed rates of exchange to be used for calculating the payments, shall be as stated in the Appendix to Tender, except as otherwise agreed by both Parties;
 - (ii) payments and deductions under Sub-Clause 13.5 [*Provisional Sums*] and Sub-Clause 13.7 [*Adjustments for Changes in Legislation*] shall be made in the applicable currencies and proportions; and
 - (iii) other payments and deductions under sub-paragraphs (a) to (d) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*] shall be made in the currencies and proportions specified in sub-paragraph (a)(1) above;
 - (b) payment of the damages specified in the Appendix to Tender shall be made in the currencies and proportions specified in the Appendix to Tender;
 - (c) other payments to the Employer by the Contractor shall be made in the currency in which the sum was expended by the Employer, or in such currency as may be agreed by both Parties;
 - (d) if any amount payable by the Contractor to the Employer in a particular currency exceeds the sum payable by the Employer to the Contractor in that currency, the Employer may recover the balance of this amount from the sums otherwise payable to the Contractor in other currencies; and
 - (e) If no rates of exchange are stated in the Appendix to Tender, they shall be those prevailing on the Base Date and determined by the central bank of the Country
-

Termination by Employer

15.1

Notice to Correct

If the Contractor fails to carry out any obligation under the Contract the Engineer may by notice require the Contractor to make good the failure and to remedy it within a specified reasonable time.

15.2

Termination by Employer

The Employer shall be entitled to terminate the Contract if the Contractor:

- a) fails to comply with Sub-Clause 4.2 [*Performance Security*] or with a notice Under Sub-Clause 15.1 [*Notice to Correct*],
- (b) abandons the Works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract,
- (c) without reasonable excuse fail:
 - (i) to proceed with the Works in accordance with Clause 8 [Commencement, Delay and Suspension], or
 - (ii) to comply with a notice issued under Sub-Clause 7.5 [Rejection] or Sub-Clause 7.6 (Remedial Work), within 28 days after receiving it,

- (d) Subcontracts the whole of the Works or assigns the Contract without the required agreement,
- (e) becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events, or
- (f) gives or offers to give (directly or indirectly) to any person any bribe, gift, gratuity commission or thing of value, as an inducement or reward:
 - (i) for doing or forbearing to do any action in relation to the Contract, or
 - (ii) for showing or forbearing to show favour or disfavor to any person in relation to the Contract,

or if any of the Contractor's Personnel, agents or Subcontractors gives or offers to give (directly or indirectly) to any person any such inducement or reward as is described in this sub-paragraph (f). However, lawful inducements and rewards to Contractor's Personnel shall not entitle termination.

In any of these events or circumstances, the Employer may, upon giving 14 days' notice to the Contractor, terminate the Contract and expel the Contractor from the Site. However, in the case of sub-paragraph (e) or (f), the Employer may by notice terminate the Contract immediately.

The employer's election to terminate the Contract shall not prejudice any other rights of the Employer, under the Contract or otherwise.

The Contractor shall then leave the Site and deliver any required Goods, all Contractor's Documents, and other design documents made by or for him, to the Engineer. However, the Contractor shall use his best efforts to comply immediately with any reasonable instructions included in the notice (i) for the assignment of any subcontract, and (ii) for the protection of life or property or for the safety of the Works.

After termination, the Employer may complete the Works and/or arrange for any other entities to do so. The Employer and these entities may then use any Goods Contractor's Documents and other design documents made by or on behalf of the Contractor.

The Employer shall then give notice that the Contractor's Equipment and Temporary Works will be released to the Contractor at or near the Site. The Contractor shall promptly arrange their removal at the risk and cost of the Contractor. However, if by this time the Contractor has failed to make a payment due to the Employer, these items may be sold by the Employer in order to recover this payment. Any balance of the proceeds shall then be paid to the Contractor.

15.3

Valuation at Date of Termination

As soon as practicable after a notice of termination under Sub-Clause 15.2 [*Termination by Employer*] has taken effect, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine the value of the Works, Goods and Contractor's Documents, and any other sums due to the Contractor for work executed in accordance with the Contract.

15.4

Payment after Termination

After a notice of termination under Sub-Clause 15.2 (Termination taken effect, the Employer may:

- (a) proceed in accordance with Sub-Clause 2.5 [*Employer's Claims*],
- (b) withhold further payments to the Contractor until the costs of design, execution, completion and remedying of any defects, damages for delay in completion (if any), and all other costs incurred by the Employer, have been established, and/or
- (c) recover from the Contractor any losses and damages incurred by the Employer and any extra costs of completing the Works, after allowing for any sum due to the Contractor under Sub-Clause 15.3 [*Valuation at Date of Termination*]. After recovering any such losses, damages and extra costs, the Employer shall pay any balance to the Contractor.

15.5

Employer's Entitlement to Termination

The

The Employer shall be entitled to terminate the Contract, at any time for the Employer's convenience, by giving notice of such termination to the Contractor.

termination shall take effect 28 days after the later of the dates on which the Contractor receives this notice or the Employer returns the Performance Security. The Employer shall not terminate the Contract under this Sub-Clause in order to execute the Works himself or to arrange for the Works to be executed by another contractor.

After this termination, the Contractor shall proceed in accordance with Sub-Clause 16.3 [*Cessation of Work and Removal of Contractor's Equipment*] and shall be paid in accordance with Sub-Clause 19.6 [*Optional Termination Payment and Release*].

Suspension and Termination by Contractor

16.1

Contractor's Entitlement to Suspend Work

If the Engineer fails to certify In accordance with Sub-Clause 14.6 [*Issue of Interim Payment Certificates*] or the Employer fails to comply with Sub-Clause 2.4 [*Employer's Financial Arrangements*] or Sub-Clause 14.7 [*Payment*], the Contractor may, after giving not less than 21 days' notice to the Employer, suspend work (or reduce the rate of work) unless and until the Contractor has received the Payment Certificate, reasonable evidence or payment, as the case may be and as described in the notice.

The Contractor's action shall not prejudice his entitlements to financing charges under Sub-Clause 14.8 [*Delayed Payment*] and to termination under Sub-Clause 16.2 [*Termination by Contractor*].

If the Contractor subsequently receives such Payment Certificate evidence or payment (as described in the relevant Sub-Clause and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.

If the Contractor suffers delay and/or incurs Cost as a result of suspending work (or reducing the rate of work) In accordance with this Sub-Clause, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such Cost plus reasonable profit which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

16.2

Termination by Contractor

The Contractor shall be entitled to terminate the Contract if:

- (a) the Contractor does not receive the reasonable evidence within 42 days after giving notice under Sub-Clause 16.1 [*Contractor's Entitlement to Suspend Work*] in respect of a failure to comply with Sub-Clause 2.4 [*Employer's Financial Arrangements*],
- (b) the Engineer falls, within 56 days after receiving a Statement and supporting documents, to issue the relevant Payment Certificate,
- (c) the Contractor does not receive the amount due under an Interim Payment Certificate within 42 days after the expiry of the time stated in Sub-Clause 14.7 [*Payment*] within which payment is to be made (except for deductions in accordance with Sub-Clause 2.5 [*Employer's Claims*]),
- (d) the Employer substantially fails to perform his obligations under the Contract,
- (e) the Employer fails to comply with Sub-Clause 1.6 [*Contract Agreement*] or Sub-Clause 1.7 [*Assignment*],
- (f) a prolonged suspension affects the whole of the Works as described in Sub-Clause 8.11 [*Prolonged Suspension*], or
- (g) the Employer becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events.

In any of these events or circumstances, the Contractor may, upon giving 14 days' notice to the Employer, terminate the Contract. However, in the case of sub-paragraph (f) or (g), the Contractor may by notice terminate the Contract immediately.

The Contractor's election to terminate the Contract shall not prejudice any other rights of the Contractor, under the Contract or otherwise.

16.3

Cessation of Work and Removal of Contractor's Equipment

After a notice of termination under Sub-Clause 15.5 [*Employer's Entitlement to Termination*], Sub-Clause 16.2 [*Termination by Contractor*] or Sub-Clause 19.6 [*Optional Termination, Payment and Release*] has taken effect the Contractor shall promptly:

- (a) cease all further work, except for such work as may have been instructed by the Engineer for the protection of life or property or for the safety of the Works
- (b) hand over Contractor's Documents Plant Materials and other work, for which the Contractor has received payment, and
- (c) remove all other Goods from the Site, except as necessary for safety and leave the Site.

16.4

Payment on Termination

After a notice of termination under Sub-Clause 16.2 [*Termination by Contractor*] has taken effect, the Employer shall promptly:

- (a) return the Performance Security to the Contractor
- (b) pay the Contractor in accordance with Sub-Clause 19.6 [*Optional Termination, Payment and Release*], and
- (c) pay to the Contractor the amount of any loss of profit or other loss or damage sustained by the Contractor as a result of this termination.

Risk and Responsibility

17.1

Indemnities

The Contractor shall indemnify and hold harmless the Employer, the Employer's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of:

- (a) bodily Injury, sickness, disease or death, of any person whatsoever arising out of or in the course of or by reason of the design, execution and completion of the Works and the remedying of any defects, unless attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents, and
- (b) damage to or loss of any property, real or personal (other than the Works) to the extent that such damage or loss:
 - (i) arises out of or In the course of or by reason of the design, execution and completion of the Works and the remedying of any defects, and
 - (ii) is attributable to any negligence, wilful act or breach of the Contract by the Contractor, the Contractor's Personnel, their respective agents, or anyone directly or Indirectly employed by any of them.

The Employer shall indemnify and hold harmless the Contractor, the Contractor's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of (1) bodily injury sickness, disease or death, which is attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents, and (2) the matters for which liability may be excluded from Insurance cover as described in sub-paragraphs (d)(i), (ii) and (iii) of Sub-Clause 18.3 [*Insurance Against Injury to Persons and Damage to Property*].

17.2

Contractor's Care of the Works

The Contractor shall take full responsibility for the care of the Works and Goods from the Commencement Date until the Taking-Over Certificate is issued (or is deemed to be issued under Sub-Clause 10.1 [*Taking Over of the Works and Sections*]) for the Works, when responsibility for the care of the Works shall pass to the Employer. If a Taking-Over Certificate is issued (or is so deemed to be issued) for any Section or part of the Works, responsibility for the care of the Section or part shall then pass to the Employer.

After responsibility has accordingly passed to the Employer the Contractor shall take responsibility for the care of any work which is outstanding on the date stated in a Taking-Over certificate, until this outstanding work has been completed.

If any loss or damage happens to the Works Goods or Contractor's Documents during the period when the Contractor is responsible for their care, from any cause not listed in Sub-Clause 17.3 [*Employer's Risks*], the Contractor shall rectify the loss or damage at the Contractor's risk and cost, so that the Works, Goods and Contractor's Documents conform with the Contract.

The Contractor shall be liable for any loss or damage caused by any actions performed by the Contractor after a taking- Over Certificate has been issued. The Contractor shall also be liable for any loss or damage which occurs after a Taking-Over Certificate has been issued and which arose from a previous event for which the Contractor was liable.

17.3

Employers Risks

The risks referred to in Sub-Clause 17.4 below are:

- (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (b) rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war, within the Country,
- (c) riot, commotion or disorder within the Country by persons other than the Contractor's Personnel and other employees of the Contractor and Subcontractors,
- (d) munitions of war, explosive materials, ionising radiation or contamination by radio-activity, within the Country, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity,
- (e) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,
- (f) use or occupation by the Employer of any part of the Permanent Works, except as may be specified in the Contract,
- (g) design of any part of the Works by the Employer's Personnel or by others for whom the Employer is responsible, if any, and
- (h) any operation of the forces of nature which is Unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate preventative precautions.

17.4

Consequences of Employer's Risks

If and to the extent that any of the risks listed in Sub-Clause 17.3 above results in loss or damage to the Works, Goods or Contractor's Documents, the Contractor shall promptly give notice to the Engineer and shall rectify this loss or damage to the extent required by the Engineer.

If the Contractor suffers delay and/or incurs Cost from rectifying this loss or damage, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such Cost, which shall be included in the Contract Price. In the case of sub-paragraphs (f) and (g) of Sub-Clause 17.3 [*Employer's Risks*] reasonable profit on the Cost shall also be included.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

17.5

Intellectual and Industrial Property Rights

In this Sub-Clause, "infringement" means an infringement (or alleged infringement) of any patent, registered design, copyright, trade mark, trade name, trade secret or other intellectual or industrial property right relating to the Works; and "claim" means a claim (or proceeding pursuing a claim) alleging an infringement.

Whenever a Party does not give notice to the other Party of any claim within 28 days of receiving the claim, the first Party shall be deemed to have waived any right to indemnity under this Sub-Clause.

The Employer shall indemnify and hold the Contractor harmless against and from any claim alleging an infringement which is or was:

- (a) an unavoidable result of the Contractor's compliance with the Employer's Requirements, or

- (b) a result of any Works being used by the Employer:
 - (i) for a purpose other than that indicated by, or reasonably to be inferred from, the Contract, or
 - (ii) in conjunction with anything not supplied by the Contractor, unless such use was disclosed to the Contractor prior to the Base Date or is stated in the Contract.

The Contractor shall indemnify and hold the Employer harmless against and from any other claim which arises out of or in relation to (i) the Contractor's design manufacture, construction or execution of the Works, (ii) the use of Contractor's Equipment, or (iii) the proper use of the Works.

If a Party is entitled to be indemnified under this Sub-Clause, the indemnifying Party may (at its cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it. The other Party shall, at the request and cost of the Indemnifying Party, assist In contesting the claim. This other Party (and its Personnel) shall not make any admission which might be prejudicial to the indemnifying Party, unless the indemnifying Party failed to take over the conduct of any negotiations, litigation or arbitration upon being requested to do so by such other Party.

17.6

Limitation of Liability of

Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than under Sub-Clause 16.4 [*Payment on Termination*] and Sub-Clause 17.1 [*Indemnities*].

The total liability of the Contractor to the Employer, under or in connection with the Contract other than under Sub-Clause 4.19 [*Electricity, Water and Gas*], Sub-Clause 4.20 [*Employer's Equipment and Free-Issue Material*], Sub-Clause 17.1 [*Indemnities*] and Sub-Clause 17.5 [*Intellectual and Industrial Property Rights*], shall not exceed the sum stated in the Particular Conditions or (if a sum is not so stated) the Accented Contract Amount.

This Sub-Clause shall not limit liability in any case of fraud deliberate default or reckless misconduct by the defaulting Party.

Insurance

18.1

General Requirements for Insurances

In this Clause, "insuring Party" means, for each type of insurance, the Party responsible for effecting and maintaining the insurance specified in the relevant Sub-Clause.

Wherever the Contractor is the insuring Party, each insurance shall be effected with insurers and in terms approved by the Employer. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.

Wherever the Employer is the insuring Party, each insurance shall be effected with insurers and in terms consistent with the details annexed to the Particular Conditions.

If policy is required to indemnify joint insured, the cover shall apply separately to each insured as though a separate policy had been issued for each of the joint

insured. If a policy indemnifies additional joint insured, namely in addition to the insured specified in this Clause, (i) the Contractor shall act under the policy on behalf of these additional joint insured except that the Employer shall act for Employer's Personnel, (ii) additional joint insured shall not be entitled to receive payments directly from the insurer or to have any other direct dealings with the insurer, and (iii) the insuring Party shall require all additional joint insured to comply with the conditions stipulated in the policy.

Each policy insuring against loss or damage shall provide for payments to be made in the currencies required to rectify the loss or damage. Payments received from insurers shall be used for the rectification of the loss or damage.

The relevant Insuring Party shall, within the respective periods stated in the Appendix to Tender (calculated from the Commencement Date), submit to the other Party:

- (a) evidence that the insurances described in this Clause have been effected, and
- (b) copies of the policies for the insurances described in Sub-Clause 18.2 [*Insurance for Works and Contractor's Equipment*] and Sub-Clause 18.3 [*Insurance against Injury to Persons and Damage to Property*].

When each premium is paid, the insuring Party shall submit evidence of payment to the other Party. Whenever evidence or policies are submitted the Insuring Party shall also give notice to the Engineer.

Each Party shall comply with the conditions stipulated in each of the insurance policies. The insuring Party shall keep the Insurers informed of any relevant changes to the execution of the Works and ensure that insurance is maintained in accordance with this Clause.

Neither Party shall make any material alteration to the terms of any insurance without the prior approval of the other Party. If an insurer makes (or attempts to make) any alteration the Party first notified by the insurer shall promptly give notice to the other Party.

If the insuring Party fails to effect and keep in force any of the Insurances it is required to effect and maintain under the Contract, or fails to provide satisfactory evidence and copies of policies in accordance with this Sub-Clause, the other Party may (at its option and without prejudice to any other right or remedy) effect insurance for the relevant coverage and pay the premiums due. The insuring Party shall pay the amount of these premiums to the other Party, and the Contract Price shall be adjusted accordingly.

Nothing in this Clause limits the obligations, liabilities or responsibilities of the Contractor or the Employer, under the other terms of the Contract or otherwise. Any amounts not insured or not recovered from the insurers shall be borne by the Contractor and/or the Employer in accordance with these obligations liabilities or responsibilities. However, if the Insuring Party fails to effect and keep in force an insurance which is available and which it is required to effect and maintain under the Contract, and the other Party neither approves the omission nor effects insurance for the coverage relevant to this default, any moneys which should have been recoverable under this insurance shall be paid by the insuring Party.

Payments by one to the other Party shall be subject to Sub-Clause 2.5 (Employer's Claims) or Sub-Clause 20.1 (Contractor's Claims), as applicable

18.2
Insurance for Works
Equipment

The insuring Party shall insure the Works, Plant, Materials and Contractor's Documents for not less than full reinstatement cost including the cost of

demolition, removal of debris and professional fees and profit. This insurance shall be effective from the date by which the evidence is to be submitted under sub-paragraph (a) of Sub-Clause 18.1 [*General Requirements for Insurances*], until the date of issue of the Taking-Over Certificate for the Works.

The insuring Party shall maintain this insurance to provide cover until the date of issue of the Performance Certificate, for loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking-Over Certificate, and for loss or damage caused by the Contractor in the course of any other operations (including those under Clause 11 [*Defects Liability*] and Clause 12 [*Tests after Completion*]).

The insuring Party shall insure the Contractor's Equipment for not less than the full replacement value, including delivery to Site. For each item of Contractor's Equipment, the insurance shall be effective while it is being transported to the Site and until it is no longer required as Contractor's Equipment.

Unless otherwise stated in the Particular Conditions, insurances under this Sub-Clause:

- (a) shall be effected and maintained by the Contractor as insuring Party,
- (b) shall be in the joint names of the Parties, who shall be jointly entitled to receive payments from the insurers, payments being held or allocated between the Parties for the sole purpose of rectifying the loss or damage,
- (c) shall cover all loss and damage from any cause not listed in Sub-Clause 17.3 [*Employer's Risks*],
- (d) shall also cover loss or damage to a part of the Works which is attributable to the use or occupation by the Employer of another part of the Works and loss or damage from the risks listed in sub-paragraphs (c), (g) and (h) of Sub-Clause 17.3 [*Employer's Risks*], excluding (in each case) risks which are not insurable at commercially reasonable terms, with deductibles per occurrence of not more than the amount stated in the Appendix to Tender (if an amount is not so stated this sub-paragraph (d) shall not apply), and
- (e) may however exclude loss of, damage to, and reinstatement of:
 - (i) a part of the Works which is in defective condition due to a defect in its design, materials or workmanship (but cover shall include any other parts which are lost or damaged as a direct result of this defective condition and not as described in sub-paragraph (ii) below)
 - (ii) a part of the Works which is lost or damaged in order to reinstate any other part of the Works if his other part is in a defective condition due to a defect in its design, materials or workmanship
 - (iii) a part of the Works which has been taken over by the Employer, except to the extent that the Contractor is liable for the loss or damage, and
 - (iv) Goods while they are not in the Country subject to Sub-Clause 14.5 [*Plant and Materials intended for the Works*].

If, more than one year after the Base date, the cover described in Sub-paragraph (d) above ceases to be available at commercially reasonable terms, the Contractor shall (as insuring Party) give notice to the Employer, with supporting particulars. The Employer shall then (i) be entitled subject to Sub-Clause 2.5 [*Employer's Claims*] to payment as the Contractor should have expected to have paid such cover, and (ii) be deemed, unless he obtains the cover at commercially reasonable terms, to have approved the omission under Sub-Clauses 18.1 (General Requirements for Insurance).

18.3

insurance against Injury to Persons and Damage to Property

The insuring Party shall Insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Sub-Clause 18.2 [*Insurance for Works and Contractors Equipment*]) or to any person (except persons insured under Sub-Clause 18.4 [*Insurance for Contractor's Personnel*]), which may arise out of the Contractor's performance of the Contract and occurring before the issue of the Performance Certificate.

This insurance shall be for a limit per occurrence of not less than the amount stated in the Appendix to Tender, with no limit on the number of occurrences. If an amount is not stated in the Appendix to Tender, this Sub-Clause shall not apply.

Unless otherwise stated In the Particular Conditions, the insurances specified In this Sub-Clause:

- (a) shall be effected and maintained by the Contractor as insuring Party,
- (b) shall be in the joint names of the Parties,
- (c) shall be extended to cover liability for all loss and damage to the Employer's property (except things Insured under Sub-Clause 18.2) arising out of the Contractor's performance of the Contract, and
- (d) may however exclude liability to the extent that it arises from:
 - (i) the Employer's right to have the Permanent Works executed on, over, under, in or through any land, and to occupy this land for the Permanent Works,
 - (ii) damage which is an unavoidable result of the Contractor's obligations to execute the Works and remedy any defects, and
 - (iii) a cause listed in Sub-Clause 17.3 [*Employer's Risks*], except to the extent that cover is available at commercially reasonable terms.

18.4

Insurance for Contractor's Personnel

The Contractor shall effect and maintain insurance against liability for claims damages, losses and expenses (Including legal fees and expenses) arising from injury sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel.

The Employer and the Engineer shall also be indemnified under the policy of insurance, except that this insurance may exclude losses and claims to the extent they arise from any act or neglect of the Employer or of the Employer's Personnel.

The insurance shall be maintained in full force and effect during the whole time that these personnel are assisting in the execution of the Works For a Subcontractor's employees, the insurance may be effected by the Subcontractor but the Contractor shall be responsible for compliance with this Clause.

Force Majeure

19.1

Definition of Force Majeure

In this Clause, "Force Majeure" means an exceptional event or circumstance:

- (a) which is beyond a Party's control
- (b) which such Party could not reasonably have provided against before entering into the Contract
- (c) which, having arisen such Party could not reasonably have avoided or overcome, and
- (d) which is not substantially attributable to the other Party.

Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:

- (i) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (ii) rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war,
- (iii) riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel and other employees of the Contractor and Subcontractors,
- (iv) munitions of war, explosive materials, ionising radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity, and
- (v) natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

19.2

Notice of Force Majeure

If a Party is or will be prevented from performing any of its obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.

The Party shall, having given notice, be excused performance of such obligations for so long as such Force Majeure prevents it from performing them.

Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.

19.3

Duty to Minimise Delay

Each Party shall at all times use all reasonable endeavours to minimise any delay in the performance of the Contract as a result of Force Majeure.

A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.

19.4

Consequences of Force Majeure

If the Contractor is prevented from performing any of his obligations under the Contract by Force Majeure of which notice has been given under Sub-Clause 19.2 [*Notice of Force Majeure*] and suffers delay and/or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) in extension of time for any such delay if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*] and
- (b) if the event or circumstance is of the kind described in sub-paragraphs (i) to (iv) of Sub-Clause 19.1 (Definition of force Majeure) and, in the case of sub-paragraphs (ii) to (iv), occurs in the Country, payment of any such Cost,

After receiving this notice the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

19.5

Force Majeure Affecting Sub-contractor

If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in

this Clause, such additional or broader force majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Clause.

19.6
**Optional Termination,
Payment and Release**

If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under Sub-Clause 19.2 [*Notice of Force Majeure*], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Contractor shall proceed in accordance with Sub-Clause 16.3 [*Cessation of Work and Removal of Contractor's Equipment*].

Upon such termination, the Engineer shall determine the value of the work done and issue a Payment Certificate which shall include:

- (a) the amounts payable for any work carried out for which a price is stated in the Contract;
- (b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer
- (c) when paid for by the Employer, and the Contractor shall place the same at the Employer's disposal;
- (d) any other Cost or liability which in the circumstances was reasonably Incurred by the Contractor in the expectation of completing the Works; the Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of
- (e) these items to the Contractor's works In his country (or to any other destination at no greater cost); and the Cost of repatriation of the Contractor's staff and labour employed wholly In connection with the Works at the date of termination

19.7
**Release from
Performance
under the Law**

Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both Parties to fulfil its or their contractual obligations or which, under the law governing the Contract entitles the

Parties to be released from further performance of the Contract then upon notice by either Party to the other Party of such event or circumstance:

- (a) the Parties shall be discharged from further performance without prejudice to the rights of either Party in respect of any previous breach of the Contract and
 - (b) the sum payable by the Employer to the Contractor shall be the same as would have been payable under Sub-Clause 19.6 [*Optional Termination Payment and Release*] if the Contract had been terminated under Sub-Clause 19.6
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Claims, Disputes and Arbitration

20.1
Contractor's Claims

If the Contractor considers himself to be entitled to any extension of the time for Completion and/or any additional payment under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Engineer, describing the event or circumstances giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.

The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Engineer. Without admitting the Employer's liability, the Engineer may, after receiving any notice under this Sub-Clause, monitor the record-keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Engineer to inspect all these records, and shall (if instructed) submit copies to the Engineer.

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Engineer a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

- (a) this fully detailed claim shall be considered as interim;
- (b) the Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the Engineer may reasonably require; and
- (c) the Contractor shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Engineer.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Engineer and approved by the Contractor, the Engineer shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within such time.

Each Payment Certificate shall include such amounts for any claim as have been reasonably substantiated as due under the relevant provision of the Contract unless and until the particulars supplied are sufficient to substantiate the whole of the claim the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

The Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with Sub-Clause 8.4 [*Extension of Time for Completion*] and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause.

**20.2
Appointment of the
Dispute Adjudication
Board**

Disputes shall be adjudicated by a DAB in accordance with Sub-Clause 20.4 [*Obtaining Dispute Adjudication Board's Decision*]. The Parties shall jointly appoint a DAB by the date 28 days after a Party gives notice to the other Party of its intention to refer a dispute to a DAB in accordance with Sub-Clause 20.4.

The DAB shall comprise, as stated in the Appendix to Tender, either one or three suitably qualified persons ("the members"). If the number is not so stated and the Parties do not agree otherwise, the DAB shall comprise three persons.

If the DAB is to comprise three persons, each Party shall nominate one member for the approval of the other Party. The Parties shall consult both these members and shall agree upon the third member, who shall be appointed to act as chairman.

However, if a list of potential members is included in the Contract, the members shall be selected from those on the list, other than anyone who is unable or unwilling to accept appointment to the DAB.

The agreement between the Parties and either the sole member ("adjudicator") or each of the three members shall incorporate by reference the General Conditions of Dispute Adjudication Agreement contained in the Appendix to these General Conditions, with such amendments as are agreed between them.

The terms of the remuneration of either the sole member or each of the three members shall be mutually agreed upon by the Parties when agreeing the terms of appointment. Each Party shall be responsible for paying one-half of this remuneration.

If at any time the Parties so agree, they may appoint a suitably Qualified person or persons to replace any one or more members of the DAB. Unless the Parties agree otherwise, the appointment will come into effect if a member declines to act or is unable to act as a result of death, disability, resignation or termination of appointment. The replacement shall be appointed in the same manner as the replaced person was required to have been nominated or agreed upon, as described in this Sub-Clause

The appointment of any member may be terminated by mutual of both Parties, but not by the Employer or the Contractor acting alone. Unless otherwise agreed by both Parties, the appointment of the DAB (including each member) shall expire when the DAB has given its decision on the dispute referred to it under Sub Clause 20.4 [*Obtaining Dispute Adjudication Board's Decision*] unless other disputes have been referred to the DAB by that time under Sub-Clause 20.4 in which event the relevant date shall be when the DAB has also given decisions on those disputes.

**20.3
Failure to Agree Dispute
Adjudication Board**

If any of the following conditions apply namely:

- (a) the Parties Fail to agree upon the appointment of the sole member of the DAB by the date stated in the first paragraph of Sub-Clause 20.2 [*Appointment of the Dispute Adjudication Board*],
- (b) either Party fails to nominate a member (for approval by the other Party) of a DAB of three persons by such date,
- (c) the Parties fail to agree upon the appointment of the third
- (d) member (to act as chairman) of the DAB by such date, or
- (e) the Parties fail to agree upon the appointment of a replacement person within 42 days after the date on which the sole member or one of the three members declines to act or is unable to act as a result of death, disability, resignation or termination of appointment,

then the appointing entity or official named In the Appendix to Tender shall, upon the request of either or both of the Parties and after due consultation with both Parties, appoint this member of the DAB. This appointment shall be final and conclusive. Each Party shall be responsible for paying one-half of the remuneration of the appointing entity or official.

20.4

Obtaining Dispute Adjudication Board's Decision

If a dispute (of any kind whatsoever) arises between the Parties In connection with, or out of, the Contract or the execution of the Works, including any dispute as to any certificate, determination, instruction, opinion or valuation of the Engineer, then after a DAB has been appointed pursuant to Sub-Clauses 20.2 [*Appointment of the DAB*] and 20.3 [*Failure to Agree DAB*] either Party may refer the dispute in writing to the DAB for its decision, with copies to the other Party and the Engineer. Such reference shall state that it is given under this Sub-Clause.

For a DAB of three persons, the DAB shall be deemed to have received such reference on the date when It is received by the chairman of the DAB.

Both Parties shall promptly make available to the DAB all information, access to the Site, and appropriate facilities, as the DAB may require for the purposes of making a decision on such dispute. The DAB shall be deemed to be not acting as arbitrator(s).

Within 84 days after receiving such reference, or the advance payment referred to In Clause 6 of the Appendix - General Conditions of Dispute Adjudication Agreement, whichever date is later, or within such other period as may be proposed by the DAB and approved by both Parties, the DAB shall give its decision, which shall be reasoned and shall state that it is given under this Sub-Clause. However, if neither of the Parties has paid in full the invoices submitted by each member pursuant to Clause 6 of the Appendix, the DAB shall not be obliged to give its decision until such invoices have been paid in full. The decision shall be binding on both Parties, who shall promptly give effect to it unless and until it shall be revised in an amicable settlement or an arbitral award as described below. Unless the Contract has already been abandoned, repudiated or terminated, the Contractor shall continue to proceed with the Works in accordance with the Contract.

If either Party is dissatisfied with the DAB's decision, then either Party may within 28 days after receiving the decision, give notice to the other Party of its dissatisfaction. If the DAB fails to give Its decision within the period of 84 days (or as otherwise approved) after receiving such reference or such payment, then either Party may within 28 after this period has expired, give notice to the other Party of its dissatisfaction

In either event, this notice of dissatisfaction shall state that it is given under this Sub Clause, and shall set out the matter in dispute and the reason(s) for dissatisfaction" Except as stated in Sub-Clause 20.7 [*Failure to Comply with Dispute Adjudication Board's Decision*] and Sub-Clause' 20.8 [*Expiry of Dispute Adjudication Board's Appointment*], neither Party shall be entitled to commence arbitration of a dispute unless a notice of dissatisfaction has been given in accordance with this Sub- Clause.

If the DAB has given its decision as to a matter in dispute to both Parties, and no notice of dissatisfaction has been given by either Party within 28 days after it received the DAB's decision, then the decision shall become final and binding upon both Parties.

20.5

Amicable Settlement

Where notice of dissatisfaction has been given under Sub-Clause 20.4 above, both

commenced on or after the fifty-sixth day after the day on which notice of dissatisfaction was given, even if no attempt at amicable settlement has been made

20.6

Arbitration

Unless settled amicably, any dispute in respect of which the DAB's decision (if any) has not become final and binding shall be finally settled by international arbitration. Unless otherwise agreed by both Parties:

- (a) the dispute shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce,
- (b) the dispute shall be settled by three arbitrators appointed in accordance with these Rules, and
- (c) the arbitration shall be conducted in the language for communications defined in Sub-Clause 1.4 [*Law and Language*].

The arbitrator(s) shall have full power to open up, review and revise any certificate determination, instruction, opinion or valuation of the Engineer, and any decision of the DAB, relevant to the dispute. Nothing shall disqualify the Engineer from being called as a witness and giving evidence before the arbitrator(s) on any matter whatsoever relevant to the dispute.

Neither Party shall be limited in the proceedings before the arbitrator(s) to the evidence or arguments previously put before the DAB to obtain its decision or to the reasons for dissatisfaction given in its notice of dissatisfaction. Any decision of the DAB shall be admissible in evidence in the arbitration.

Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Engineer and the DAB shall not be altered by reason of any arbitration being conducted during the progress of the Works.

20.7

Failure to Comply with Dispute Adjudication Board's Decision

In the event that:

- (a) neither Party has given notice of dissatisfaction within the period stated in Sub Clause 20.4 [*Obtaining Dispute Adjudication Board's Decision*]
- (b) the DAB's related decision (if any) has become final and binding and
- (c) a Party fails to comply with this decision,

then the other Party may, without prejudice to any other rights it may have refer the failure itself to arbitration under Sub-Clause 20.6 [*Arbitration*]. Sub-Clause 20.4 [*Obtaining Dispute Adjudication Board's Decision*] and Sub-Clause 20.5 [*Amicable Settlement*] shall not apply to this reference.

20.8

Expiry of Dispute Adjudication Board's Appointment

If a dispute arises between the Parties in connection with or arising out of the Contract or the execution of the Works and there is no DAB in place whether by reason of the expiry of the DAB's appointment or otherwise:

- (a) Sub-Clause 20.4 [*Obtaining Dispute Adjudication Board's Decision*] and Sub-Clause 20.5 [*Amicable Settlement*] shall not apply and
 - (b) the dispute may be referred directly to arbitration under Sub-Clause 20.6 [*Arbitration*].
-

APPENDIX

General Conditions of Dispute Adjudication Agreement

1

Definitions

Each "Dispute Adjudication Agreement" is a tripartite agreement by and between:

- (a) the "Employer";
- (b) the "Contractor"; and
- (c) the "Member" who is defined in the Dispute Adjudication Agreement as being:
 - (i) the sole member of the "DAB" (or "adjudicator") and, where this is the case, all references to the "Other Members" do not apply,
or
 - (ii) one of the three persons who are jointly called the "DAB" (or "dispute adjudication board") and, where this is the case, the other two persons are called the "Other Members".

The Employer and the Contractor have entered (or intend to enter) into a contract, which is called the "Contract" and is defined in the Dispute Adjudication Agreement! which incorporates this Appendix. In the Dispute Adjudication Agreement, words and expressions which are not otherwise defined shall have the meanings assigned to them in the Contract.

2

General Provisions

The Dispute Adjudication Agreement shall take effect when the Employer the Contractor and each of the Members (or Member) have respectively each signed a dispute adjudication agreement.

When the Dispute Adjudication Agreement has taken effect, the Employer and the Contractor shall each give notice to the Member accordingly. If the Member does not receive either notice within six months after entering into the Dispute Adjudication Agreement, it shall be void and ineffective.

This employment of the Member is a personal appointment No assignment or subcontracting of the Dispute Adjudication Agreement is permitted without the prior written agreement of all the parties to it and of the Other Members (if any).

3

Warranties

The Member warrants and agrees that he/she is and shall be impartial and independent of the Employer, the Contractor and the Engineer The Member shall promptly disclose, to each of them and to the Other Members' any fact or circumstance which might appear inconsistent with his/her warranty and agreement of impartiality and independence.

When appointing the Member, the Employer and the Contractor relied upon the Member's representations that he/she is:

- (a) experienced In the work which the Contractor is to carry out under the Contract,
- (b) experienced In the interpretation of contract documentation and
- (c) fluent in the language for communications defined in the Contract

4

General Obligations' of the Member

The Member shall:

- (a) have no interest financial or otherwise in the Employer, the contractor or the

Engineer, nor any financial interest in the Contract except for payment under the Dispute Adjudication Agreement;

- (b) not previously have been employed as a consultant or otherwise by the Employer, the Contractor or the Engineer, except in such circumstances as were disclosed in writing to the Employer and the Contractor before they signed the Dispute Adjudication Agreement;
- (c) have disclosed in writing to the Employer, the Contractor and the Other Members (if any), before entering into the Dispute Adjudication Agreement and to his/her best knowledge and recollection, any professional or personal relationships with any director, officer or employee of the Employer, the Contractor or the Engineer, and any previous involvement in the overall project of which the Contract forms part;
- (d) not, for the duration of the Dispute Adjudication Agreement, be employed as a consultant or otherwise by the Employer, the Contractor or the Engineer, except as may be agreed in writing by the Employer, the Contractor and the Other Members (if any);
- (e) comply with the annexed procedural rules and with Sub-Clause 20.4 of the Conditions of Contract;
- (f) not give advice to the Employer, the Contractor, the Employer's Personnel or the Contractor's Personnel concerning the conduct of the Contract, other than in accordance with the annexed procedural rules;
- (g) not while a Member enter into discussions or make any agreement with the Employer, the Contractor or the Engineer regarding employment by any of them, whether as a consultant or otherwise, after ceasing to act under the Dispute Adjudication Agreement;
- (h) ensure his/her availability for any site visit and hearings as are necessary; and
- (i) treat the details of the Contract and all the DAB's activities and hearings as private and confidential, and not publish or disclose them without the prior written consent of the Employer, the Contractor and the Other Members (if any).

5

General Obligations of the Employer and the Contractor

The Employer, the Contractor, the Employer's Personnel and the Contractor's Personnel shall not request advice from or consultation with the Member regarding the Contract, otherwise than in the normal course of the DAB's activities under the Contract and the Dispute Adjudication Agreement, and except to the extent that prior agreement is given by the Employer, the Contractor and the Other Members (if any). The Employer and the Contractor shall be responsible for compliance with this provision, by the Employer's Personnel and the Contractor's Personnel respectively.

The Employer and the Contractor undertake to each other and to the Member that the Member shall not, except as otherwise agreed in writing by the Employer, the Contractor, the Member and the Other Members (if any):

- (a) be appointed as an arbitrator in any arbitration under the Contract'
- (b) be called as a witness to give evidence concerning any dispute before arbitrator(s) appointed for any arbitration under the Contract; or
- (c) be liable for any claims for anything done or omitted in the discharge or purported discharge of the Member's functions unless the act or omission is shown to have been in bad faith

The Employer and the Contractor hereby jointly and severally indemnify and hold the Member harmless against and from claims from which he/she is relieved from liability under the preceding paragraph

6

Payment

The Member shall be paid as follows, in the currency named in the Dispute Adjudication Agreement:

- (a) a daily fee shall be considered as payment in full for:
 - (i) each working day spent reading submissions, attending hearings (if any), preparing decisions, or making site visits (if any); and
 - (ii) each day or part of a day up to maximum of two days travel time in each direction for the journey (if any) between the Member's home and site or another location of a meeting with Other Members (if any) and/or the Employer and the Contractor;
- (b) all reasonable expenses incurred in connection with the Member's duties, including the cost of secretarial services, telephone calls, courier charges, faxes and telexes, travel expenses, hotel and subsistence costs; a receipt shall be required for each item in excess of five percent of the daily fee referred to in sub-paragraph (a) of this Clause; and
- (c) any taxes properly levied In the Country on payments made to the Member (unless a national or permanent resident of the Country) under this Clause 6.

The daily fee shall be as specified in the Dispute Adjudication Agreement.

Immediately after the Dispute Adjudication Agreement takes effect, the Member shall, before engaging in any activities under the Dispute Adjudication Agreement, submit to the Contractor, with a copy to the Employer, an invoice for (a) an advance of twenty-five (25) percent of the estimated total amount of dally fees to which he/she will be entitled and (b) an advance equal to the estimated total expenses that he/she shall incur in connection with his/her duties. Payment of such invoice shall be made by the Contractor upon his receipt of the Invoice. The Member shall not be obliged to engage in activities under the Dispute Adjudication Agreement until each of the Members has been paid in full for invoices submitted under this paragraph.

Thereafter the Member shall submit to the Contractor, with a copy to the Employer invoices for the balance of his/her dally fees and expenses, less the amounts advanced. The DAB shall not be obliged to render its decision until invoices for all dally fees and expenses of each Member for making a decision shall have been paid in full

Unless paid earlier in accordance with the above, the Contractor shall pay each of the Member's invoices in full within 28 calendar days after receiving each invoice and shall apply to the Employer (In the Statements under the Contract) for reimbursement of one-half of the amounts of these Invoices. The Employer shall then pay the Contractor in accordance with the Contract.

If the Contractor fails to pay to the Member the amount to which he/she is entitled under the Dispute Adjudication Agreement, the Employer shall pay the amount due to the Member and any other amount which may be required to maintain the operation of the DAB; and without prejudice to the Employers rights remedies, in addition to all other rights arising from this default arising from this default, the Employer shall be entitled to reimbursement of all sums paid in excess of one-half of these payments, plus all costs of recovering these sums and financing charges calculated at the rate specified in Sub-Clause 14.8 of the Conditions of Contract.

If the Member does not receive payment of the amount due within 28 days after submitting a valid invoice, the Member may (i) suspend his/her services (without notice until until the payment is received, and/or (ii) resign his/her appointment by giving notice to the Employer and the Contractor. The notice shall take effect when received by them both. Any such notice shall be final and binding on the Employer, the Contractor and the Member.

7

Default of the Member

If the Member fails to comply with any obligation under Clause 4, he/she shall not be entitled to any fees or expenses hereunder and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses received by the Member and the Other Members (if any), for proceedings or decisions (if any) of the DAB which are rendered void or ineffective.

8

Disputes

Any dispute or claim arising out of or In connection with this Dispute Adjudication Agreement, or the breach, termination or invalidity thereof, shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by one arbitrator appointed in accordance with these Rules of Arbitration.

Annex PROCEDURAL RULES

- 1 The Employer and the Contractor shall furnish to the DAB one copy of all documents which the DAB may request, including Contract documents, progress reports, variation instructions, certificates and other documents pertinent to the matter in dispute. All communications between the DAB and the Employer or the Contractor shall be copied to the other Party. If the DAB comprises three persons, the Employer and the Contractor shall send copies of these requested documents and these communications to each of these persons.

- 2 The DAB shall proceed in accordance with Sub-Clause 20.4 and these Rules. Subject to the time allowed to give notice of a decision and other relevant factors the DAB shall:
 - (a) act fairly and impartially as between the Employer and the Contractor, giving each of them a reasonable opportunity of putting his case and responding to the other's case, and
 - (b) adopt procedures suitable to the dispute, avoiding unnecessary delay or expense.

- 3 The DAB may conduct a hearing on the dispute, in which event it will decide on the date and place for the hearing and may request that written documentation and arguments from the Employer and the Contractor be presented to it prior to or at the hearing.

- 4 Except as otherwise agreed in writing by the Employer and the Contractor, the DAB shall have power to adopt an inquisitorial procedure, to refuse admission to hearings or audience at hearings to any persons other than representatives of the Employer, the Contractor and the Engineer, and to proceed in the absence of any party who the DAB is satisfied received notice of the hearing; but shall have discretion to decide whether and to what extent this power may be exercised.

- 5 The Employer and the Contractor empower the DAB, among other things, to:
 - (a) establish the procedure to be applied in deciding a dispute,
 - (b) decide upon the DAB's own jurisdiction, and as to the scope of any dispute referred to it,
 - (c) conduct any hearing as it thinks fit, not being bound by any rules or procedures other than those contained in the Contract and these Rules
 - (d) take the initiative in ascertaining the facts and matters required for a decision
 - (e) make use of its own specialist knowledge if any
 - (f) decide upon the payment of financing charges in accordance with the Contract,
 - (g) decide upon any provisional relief such as interim or conservatory measures and
 - (h) open up, review and revise any certificate, decision, determination, instruction, opinion or valuation of the Engineer, relevant to the dispute.

- 6 The DAB shall not express any opinion during any hearing concerning the merits of any arguments advanced by the Parties. Thereafter, the DAB shall make and give its decision in accordance with Sub-Clause 20.4, or as otherwise agreed by the Employer and the Contractor in writing. If the DAB comprises three persons:

- (a) it shall convene in private after a hearing, If any, in order to have discussions and prepare its decision;
 - (b) it shall endeavour to reach a unanimous decision: if this proves Impossible, the applicable decision shall be made by a majority of the Members, who may require the minority Member to prepare a written report for submission to the Employer and the Contractor; and
 - (c) if a Member fails to attend a meeting or hearing, or to fulfil any required function, the other two Members may nevertheless proceed to make a decision, unless:
 - (i) either the Employer or the Contractor does not agree that they do so, or
 - (ii) the absent Member is the chairman and he/she Instructs the other Member to not make a decision.
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**C7-A3 "ERECTION OF THE NEW
LARGE CAPACITY F&D FACILITY NPP
V1"
BIDSF 010 5 001**

C7-A3
Technical
Specifications

BIDSF project C7-A3

ERECTION OF THE NEW LARGE CAPACITY F&D FACILITY NPP V1


H1. Technical Specifications

Ref: **C7A3-TS-PMU-06001/EN, revision 3**


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DEFINITIONS, ABBREVIATIONS AND ACRONYMS

AISI	American Iron & Steel Institute
ALARA	As Low As Reasonable Achievable
ANSI	American National Standards Institute
API	American Petroleum Institute
ARSOZ	Maintenance Management Information System of JAVYS
BIDSF	Bohunice International Decommissioning Support Fund
C	Degree Celsius
CE	Certificate of Conformity
CPU	Central Processing Unit
CS	Carbon Steel
DIN	German institute for standardization
DL	Decontamination Line
DPS	Process Subsystem
EU	European Union
EC	European Commission
FEAL	Building metallic panel from iron (Fe) and aluminium (Al)
FRP	Fiberglas Reinforcement Plastic
F&D	Fragmentation and Decontamination
g	Acceleration due to gravity
HEPA	Type of very efficient filters
I&C	Instrumentation & Control
IDO	Immediate Dismantling Option
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
J	Joule
JAVYS	Jadrova a vyradovacia spolocnost, a.s. (Nuclear and Decommissioning Company, plc.)
kW	Kilowatt
kN	Kilo Newton
LILW	Low and Intermediate Level Waste
MSK	Medvedev Sponhauer Karnik scale – scale for the assessment of seismic events
MPa	Mega Pascal
MPB	Main Producing Building

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MSK	Medvedev Sponhauer Karnik scale – scale for the assessment of seismic events
MZP SR	Ministry of Environment of the Slovak Republic
NW	North - West
NEMA	National Electrical Manufacturers Association
NPP	Nuclear Power Plant
NRA (UJD SR)	Slovak Nuclear Regulatory Authority (Úrad jadrového dozoru SR)
NRR	National RAW Repository
PLC	Programmable Logic Controller
PMU	Programme Management Unit
PPP	Operating Procedures
PS	Process System
PVC	Polyvinyl chloride
QA	Quality Assurance
R	Room
RA	Radioactive
RAW	Radioactive wastes (radwaste)
Segmentation	Dismantling activity enabling dividing of large metallic facilities
SR	Slovak Republic
SS	Stainless Steel
STN	Slovak Technical Standards
TEFC	Totally Enclosed, Fan-Cooled
UVZ	Public Health Authority (Úrad verejného zdravotníctva)
V	Volt
V1 NPP	Bohunice V1 Nuclear Power Plant

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1. INTRODUCTION

1.1 BACKGROUND

As a result of Resolution No. 801/99 of the Slovak Government, the Slovak Republic undertook the commitment to finally shut down Units 1&2 of the Bohunice V1 NPP on 31st December 2006 and 31st December 2008, respectively, and to prepare their decommissioning.

In accordance with the agreement between the EC and the Slovak Government, V1 NPP was totally shut down on 31st December 2008, to be subsequently decommissioned. One of the decommissioning tasks is the safe management of decommissioning radioactive waste (RAW).

According to the approved decommissioning option, the management of metallic and building RAW has been split in two phases. The purpose of the first phase was to increase the capacity of the existing fragmentation and decontamination facilities owned by JAVYS to deal with the historical wastes.

The objective of this specification is rising from the main task for the second phase which has to be completed up by the Employer (JAVYS), that is to establish new large-capacity fragmentation and decontamination (F&D) facilities for metallic and building contaminated and activated waste from the V1 NPP decommissioning.

The approved decommissioning option is "Immediate Dismantling" (IDO) - see Figure 2. The main characteristics of the immediate decommissioning alternative are the immediate and continuous dismantling of the equipment and facilities and the demolition of the buildings. The basic principle sequence of the decommissioning activities is: system decontamination before continuous

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dismantling and decontamination after dismantling, if applicable. This is followed by the decontamination of building surfaces and the demolition of the buildings.

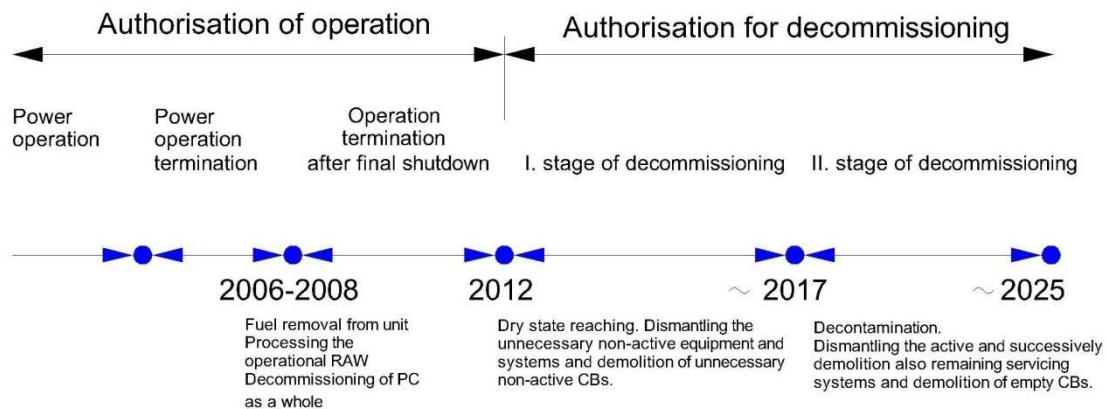


Figure 2: IDO option simplified diagram


The decommissioning of the V1 NPP will generate a substantial production of radioactive waste, with metallic and building RAW representing the majority of them. One of the most important waste management objectives is the minimisation of the decommissioning waste volume, as main purpose of the second phase. Accomplishing this objective will include implementation of decontamination programmes and controlled dismantling techniques.

1.2 OBJECTIVES

The minimisation of the RAW volume resulting from the V1 NPP decommissioning will be ensured mainly by its pre-treatment by fragmentation and decontamination.

The purpose of the C7A.3 project is to provide the necessary means for the management and processing of all metallic and building waste materials from the V1 NPP decommissioning so as to comply with the objectives of optimisation of personnel doses and minimisation of RAW and gaseous and liquid discharges, as well as minimisation of the environmental impact. Both metallic and building low and intermediate level waste (LILW) shall be dismantled (segmented), fragmented, sorted, decontaminated and released from nuclear control or processed into a form suitable for disposal in the National Repository of Mochovce (NRR). The facilities under the scope of this specification are necessary to process all V1 NPP decommissioning waste, to minimise it and to meet the decommissioning schedule.

The purpose of this technical specification within the framework of the C7A.3 project is to specify the requirements for the procurement, installation and commissioning of new large-capacity fragmentation and decontamination (F&D) equipment in the V1 NPP for contaminated and activated metallic RAW and civil structure RAW from the V1 NPP decommissioning.

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2. PROJECT GENERAL DESCRIPTION

2.1 SITE CONDITIONS AND CHARACTERISTICS

All the new fragmentation and decontamination equipment shall be installed in the controlled area of reactor building of unit 1 and 2 (building. No. 800) of the V1 NPP, at the Bohunice site (see chap. 5). The new large-capacity F&D facilities shall be suitable for installation in the following environment and in accordance with the site environmental and seismic conditions.

2.1.1 Site Environmental Conditions

The Bohunice site is situated within the region of Blatnianska Priehlbina Depression, 60 km northeast of the capital of Slovakia, Bratislava. V1 NPP Bohunice is located near the town of Trnava (70,000 inhabitants), the spa town of Piešťany (30,000 inhabitants) and at a distance of 3 km from the municipality of Jaslovské Bohunice.

Local meteorological conditions [1], cumulative over the past 40 years in the Bohunice site, are the following.

Item	Data
Average air temperature (°C)	9.4
Maximum air temperature (°C)	40.0
Minimum air temperature (°C)	-26.1
The coldest month (January) average air temperature (°C)	-1.5
The hottest month (July) average air temperature (°C)	19.5
Average air humidity (%)	75.0
Average annual precipitation (mm)	533.0
Prevailing wind direction	NW
Average wind speed (m/s)	3.9
Average number of days with snow cover per year	40.0
Average snow depth (cm) in winter months (November-March)	5.3
Maximum snow depth (cm) over the past years	47.0
Maximum wind speed (m/s)	39.4

The equipment of the new F&D facilities shall be installed inside dedicated rooms within the available space of the Controlled Area of V1 NPP, as indicated in this specification. Layout of the

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access ways (+10.5 m floor drawing) inside the controlled area of the reactor building are provided in Appendix 1.

Detail drawings of different floors and rooms of V1 NPP reactor building (Controlled Area) are provided in Appendix 2 and 3. The specified locations are characterized by the following indoor conditions:

Item	Data
Ambient temperature inside (°C):	
Maximum	40
Minimum	10
Ambient relative humidity inside (%)	not controlled

2.1.2 Seismic Conditions

Seismic activity of the given region is focused on Dobrá Voda area, where the second strongest earthquake on the territory of the Slovak Republic was registered. For Bohunice area, 6° to 7° of MSK scale of seismic hazard in macro-seismic intensity values was calculated with respect to 475-year return period [1].

Max. horizontal acceleration on the earth surface is 0.344 g, max. vertical acceleration on the earth surface is 0.214 g. The reactor building is classified as SC1 category building.

2.2 EXISTING EQUIPMENT

The site is equipped with some decontamination means designed for operational purposes. Other decontamination and fragmentation means focused on pre-decommissioning activities that will be upgraded within the frame of the C7-A2 project are available near the plant.

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2.3 INTERFACES AND USER SERVICES

The Contractor shall take into consideration the interfaces of the equipment and services with items supplied by the Employer or other party. The following are the main interface requirements to be considered by the Contractor:

- Layout of the Controlled Area (Appendix 1)
- Foundation and anchoring elements
- Connecting piping
- Transport to the site, erection and testing
- Electrical requirements
- I&C requirements
- Other services : instrument air, etc.

3. SCOPE OF SUPPLY

3.1 GENERAL

Spent fuel from the first unit of the V1 NPP was transported into Interim Spent Fuel Storage in 2009. Spent fuel from the second unit was transported in January 2011. All systems of the power plant are fully functional. The operating personnel are at hand. The V1 NPP is being prepared for decommissioning. However, certain systems will be temporarily needed to fulfil safety and other functions.

The scope of the specification covers all activities related to the erection of the new facilities for post-dismantling decontamination and fragmentation of facilities, equipment and tools for pre-treatment (fragmentation & decontamination) of metallic and building materials (RAW) arising from V1 NPP decommissioning.

The Contractor shall be responsible for furnishing the complete design, procurement of materials and equipment, manufacturing, factory inspection and testing, cleaning, coating, packing protection for shipment and transport to the Bohunice site.

The Contractor shall also be responsible for the erection and commissioning, and for the submission to the Employer of information, data, calculations, drawings, curves, procedures, certificates and other documents, as may be required by this specification, the applicable codes and standards and other reference documents specified herein.

The Contractor's duties also include the development of necessary documentation pursuant to valid acts of the SR (chiefly No. 50/1976 Coll., No. 223/2001 Coll., No. 718/2002 Coll., No. 541/2004 Coll., No. 24/2006 Coll., No. 124/2006 Coll. and No. 355/2007 Coll.) and the support to

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the Employer to obtain relevant permits. The Contractor shall especially assess and classify all the supplied equipment components in accordance with UJD SR Regulation No. 50/2006 Coll. on details concerning the nuclear safety requirements for nuclear installations in respect of their siting, design, construction, commissioning, operation, decommissioning and closure of repository, as well as criteria for categorisation of classified equipment into safety classes. The Contractor shall further assess and classify all the supplied equipment components in accordance with Regulation No. 508/2009 Coll., which lays down details on ensuring industrial safety during work with pressure equipment, lifting equipment, electric and gas equipment and which determines technical equipment regarded as classified technical equipment. Manufacture, installation, repairs and operation of the equipment, as well as the documentation and operating instructions and maintenance instructions shall fully comply with the above mentioned legislature.

The Contractor shall determine the general influences in accordance with Regulation No. 508/2009 Coll.

The Contractor shall also provide the expert statement to the Design Documentation for the building permit from the Technical Inspection or other authorized body.

The Contractor shall supply the application software including source codes.

The Contractor shall, taking into account the scope of the civil works, develop the documentation in accordance with Act No. 50/1976 Coll. [7] and its implementary regulation No. 453/2000 Coll. [28], especially all documentation necessary for the issuance of the building permit (Article 58 of Act No. 50/1976 Coll. [7]) as well as the documentation for the issuance of the decision on accepting the change in the use of the building in accordance with Article 85 of Act No. 50/1976 Coll. [7] and for the house inspection certificate (Article 76 of Act No. 50/1976 Coll. [7]), if these are necessary.


The Contractor shall develop a Health and Safety Plan from the viewpoint of ensuring safety at work and health protection in accordance with the Decree No. 396/2006 Coll. [25].

The Contractor shall among other things develop the Preliminary Environmental Study in accordance with Article 22 of Act No. 24/2006 Coll. [8] on assessing the environmental influences and on alternations of, and amendments to, some acts, as amended by later legislation.

On the basis of the decision of the competent authority on the assessment of the proposed activity the Contractor shall elaborate the "Environmental Impact Assessment Report" in accordance with Act No. 24/2006 Coll. [8] and shall actively cooperate with the Employer in the proceedings on the proposed activity in accordance with Act No. 24/2006 Coll. [8].

Nothing in this specification shall relieve the Contractor of the responsibility of performing such analyses, tests, inspections and other activities which may be considered necessary to ensure that the design, materials and workmanship are satisfactory for the service specified, or as may be required by common usage or good practice.

Should the Contractor wish to subcontract any of the work covered by this specification, it shall be his responsibility to ensure that his subcontractors are made fully aware of the relevant requirements of this specification. The Employer shall have the right of approval of proposed subcontractors.

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3.2 EQUIPMENT AND COMPONENTS TO BE SUPPLIED

The supply of the new large-capacity F&D facilities includes the following main equipment and components, piping, valves, instrumentation and control necessary to provide the RAW pre-treatment (fragmentation & decontamination) capacity required, as specified in section 5.1.2.

- The equipment for decontamination of stainless steel materials: a decontamination line (DL) that shall mainly consist of:
 - Two (2) electrochemical decontamination baths with separate direct current sources
 - Two (2) ultrasonic decontamination baths, including ultrasound generators
 - One (1) rinsing bath for high pressure water jetting
 - Seven (7) decontamination titanium baskets
- The DL shall also include auxiliary equipment, such as:
 - One (1) tank for the preparation of decontamination solutions (double-walled, with leak signalling)
 - One (1) tank for pre-treatment of used solutions (double-walled, with leak signalling)
 - One (1) cooling system for the electrochemical baths
 - One (1) filtering and regeneration module for the treatment of applied solutions
 - One (1) direct-current source and switchboard
 - Twenty (20) ultrasonic generators and emitters for each ultrasonic bath
 - One (1) handling desk
 - At least five (5) pumps for baths
 - One (1) electric hoist
 - One (1) set of operational contamination measurement equipment, compatible with existing JAVYS equipment
- The equipment for mechanical-abrasive decontamination of carbon steel materials, including:
 - Two (2) suspended blasting devices (for fragmented parts)
 - One (1) cabin for manual abrasive blasting, including all equipment (for non fragmented parts – armoured doors, etc.)

All facilities/equipment shall be equipped with an exhaust system with an adequate filtering module according to chapter 5.2.4.

The workplace shall be also dispatched with:

- one (1) handling desk
- electric hoists
- Equipment for decontamination of building floors and walls (cleaning, surface removal, shaving, grinding, mechanical abrasion, etc.):
 - One (1) super high-pressure water pump with jetting-suction accessories for the cleaning (shaving) of floors and walls, including a vacuum unit and exhaust and filtering system
 - One (1) device for the shaving of floors, with exhaust and filtering systems
 - One (1) foam generator with wet vacuum unit and with a foam-breaking accessory

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- One (1) breaker hammer
- One (1) angular grinding device for construction surfaces, with air exhaust
- Five (5) complete sets of protective clothing for working with high-pressure equipment
- Technological equipment for segmentation for dismantling of technological and auxiliary installations:
 - Two (2) self-tightening tube saw "Guillotines" with hydraulic drive and feed
 - Two (2) orbital cutters for pipes
 - Two (2) hydraulic shears
 - One (1) cable saw
 - One (1) power nibbler
 - Three (3) angular grinding segmentation devices with air exhaust
 - Two (2) electrical-hydraulic cable cutters
 - One (1) portable plasma arc cutting device with mobile exhaust system
 - One (1) portable flame cutting device with mobile exhaust system
 - Six (6) complete sets of protective clothing for working with plasma
- Technological equipment for fragmentation of dismantled components (mechanical and thermal cutting):
 - One (1) hydraulic band saw for transverse cutting
 - One (1) hydraulic band saw for lengthwise cutting
 - One(1) stationary hydraulic shear
 - One (1) hydraulic band saw
 - One (1) stationary plasma arc cutting device with mobile exhaust and filtering system
 - One (1) stationary flame cutting device with mobile exhaust system
- Provision of handling means:
 - Two (2) fork-lift trucks
 - Two (2) low-lift trucks
 - One (1) stair climber sack truck
 - One new lift
 - Modifications of the existing lift in the shaft no. R 029/2
 - One manipulator for the charging of transport containers onto the newly-installed lift
 - One (1) hand pallet platform
 - One (1) overhead crane
 - Two (2) crane scales
 - Hoists according to 5.2.7.8
- The supply shall also include the following:
 - Drive motors for all pumps and other equipment
 - One 3x400V, 50 Hz motor control centre with double feed, with draw-out cubicles, that provides power to all the motors and electrical loads of the F&D facilities

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- One new switchboard to be installed in the room No. 112 after the dismantling of existing technology equipment
- PLC SIMATIC (with a 20% reserve of spare inputs and outputs) and instrumentation required for the operation of the F&D facilities according to the requirements set out in this specification
- Cabling, cabling trays and electric conduits
- Grounding of equipment inside buildings, with connections to the plant underground grounding network
- One (1) set of anchor parts, metal base plate, supports, screws, bolts and joints necessary for assembly of the equipment supplied
- Protective joint covers for the flanged joints of reagent piping
- Two (2) sets of joints per walkway or inspection hole and one (1) joint for all flanged connections
- Provisional elements for on-site tests
- First load of filtering material
- Chemical products for testing and start up and for one (1) month of operation
- Cleaning and painting in accordance with the applicable codes and standards
- Piping to or between any equipment furnished under this specification, except where otherwise stated
- Packing and protection for transportation to the site with all necessary accessories
- Insulation, where necessary
- Heat tracing for piping and valves, when required
- Spare parts required for start up and initial operation of the equipment
- Decontamination line drain collection equipment
- Instrumentation and control equipment and components:
 - One (1) programmable logic controller (PLC SIMATIC) with CPU
 - One (1) operator interface based on a 12" colour touch screen with graphic display capacity This dialogue terminal shall be mounted on the front of the local panel
 - Local control panel
 - Full design of the control system, including operating philosophy, logic control diagrams, process displays and wiring diagrams
 - All piping, valves, fittings and instruments required for the safe and optimal operation of the system in fully automated and continuous mode, according to the scope of supply indicated in this specification. All automatic valves shall be equipped with electrical actuators. Should the implementation of air-driven valves or the use of compressed air be required for cleaning service or instrument air, the air supply system shall be included in the scope of the Contractor.
 - All necessary instrumentation for automatic and continuous operation of decontamination line with minimum operator presence. The instruments to be supplied and their installations shall meet the requirements established in chapter 5.

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- All software licenses, documentation and guarantees required for the system

At suitable points, the Contractor shall install emergency "STOP" buttons. The buttons will be used to safely shut-down the F&D facilities in case of dangerous condition of the technological equipment that might impair the personnel safety and health and/or result in major material damage.

All covers in the facilities the opening of which may result in potential injury or danger to health (e.g. splashing acid in a tank, rotating mechanical parts,...) shall be provided with safety switches.

The Contractor shall propose and install the missing lighting at the workshops and transportation routes.

The Contractor shall define and equip adequately the area for charging handling equipment batteries.

3.3 SERVICES INCLUDED IN THE SCOPE

In the tender, the Tenderer shall state detailed parameters of the proposed equipment, such as exact dimensions, weight, drawings or figures, materials used, processing capacity (output) and also the character and unit quantities of secondary RAW created during equipment operation. The Tenderer shall also justify the compliance of the material of the proposed equipment with the proposed operational chemical substances.

The delivery of chemicals for testing and start up shall be approved by the Employer in advance.

For the approval of the supply, it is necessary to submit the Safety Data Sheet for individual chemical substances or preparations in accordance with the Act No. 67/2010 Coll. (Chemical Act) on Conditions of Introduction of the Chemical Substances and Chemical Preparations to the Market and on Amending and Supplementing of Certain Acts.

The following services shall also be provided by the Contractor:

- Preparation of the selected rooms: dismantling and removal of the existing items and basic civil works (e.g. walls and ceilings modification or removal), as well as other works necessary to properly install the new equipment and connect it with the available service supply systems. If a wall modification or especially removal will be necessary, a structural engineer's opinion shall be provided.
- Preparation of rooms for intermittent storage of decontaminated materials. Provide these rooms with handling equipment for pallet stacking.

Rooms, where equipment working with liquid chemical substances and liquid RAW will be installed, shall be equipped with a collection system on the floor and emergency showers in case of an event impacting the skin of the staff.

Floors and surfaces of rooms with installed equipment shall be decontaminable.

- Design and engineering services as specifically described in the text of this specification of the new F&D facilities.
- Development and submission to the Employer of all design relevant documentation (data, drawings, curves, procedures, certificates, and other documents, as required by this specification and the applicable codes and standards)
- Certification of the equipment used

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- Supply (procurement, manufacture, and delivery) to the Employer the materials, components, equipment and documentation, necessary to construct, install, test, and commission, operate and maintain the new F&D facilities
- Definition and supply of equipment lifting and handling devices required
- Development and submission to the Employer of the manufacturer's operating, maintenance and surveillance manuals for the supplied equipment and systems. The Manuals and instructions shall be in adequate detail so that continuous treatment of all realistic RAW is enabled (except for all descriptions and procedures e.g. also determining the equipment reliability criteria, solving the degreasing of oily metal components prior to decontamination, the manner of record keeping on treated RAW, determining norms and expected characteristics of secondary RAW, etc.)
- Development and submission of spare parts lists, transport and erection procedures and field test procedures)
- Transport to the site
- Installation (field erection), commissioning supervision and testing
- Initial fill of lubricants
- Training of personnel

3.4 EQUIPMENT AND SERVICES TO BE SUPPLIED BY OTHERS

The materials classification, RAW interim storage, produced RAW treatment, and disposal are considered as being out of the scope of services to be provided by the Contractor.

The following materials, equipment and services shall be furnished by others:

- Control equipment other than those specified herein
- Water supply (potable, dematerialized)
- Emergency showers, if needed
- Necessary packages for secondary RAW transportation, (drums, bags, etc.)
- Compressed air supply
- Room lighting
- Fire protection
- Water consumed during test and commissioning

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3.5 LIMITS OF SUPPLY (INTERFACES)

The scope of supply shall include the routing of the auxiliary systems to each consumer, the limits consisting of a single interface point per room, for compressed air, ventilation extraction, power supply, water, fire protection, drain network, ventilation extraction, grounding network, etc. Connection points for all these services are available inside the corridors. Decontamination solutions supply is also available, if necessary.

Water Supply

The supply limit is the used water pipe connection. The following conditions shall be defined by the Contractor:

- Normal required flow
- Maximum required flow

The water supply is of potable quality or dematerialized water, depending on the availability in the area where the rooms are located. Water supply conditions are as follows:

- Diameter of pipelines: min.1.5"
- Operating Pressure = 0.6 MPa.

Drains, Effluents and Secondary RAW Collection

All drains from equipment drains, sampling points, tanks, effluents, etc, as well as the liquid secondary RAW, shall be collected and transported to the dedicated plant treatment facilities. The supply limit is represented by the connection point to the special canalization. Only solutions (decontamination solutions) that do not contain solid particles shall be poured into the special canalization and for this reason the Contractor shall deliver and install suitable sieves, filters or sedimentation equipment on the interfaces of the decontamination line and special canalization.

The transportation of secondary waste will be assured by the Employer staff from the designated area situated inside the reactor hall (no more than 100 m from any workshop).

The gaseous secondary RAW releases shall be through appropriate filtering (HEPA). The interface points are the connection points in the exhaust lines.

Instrument and Service Air Supply System

Instrument and service air supply interfaces will be located in points inside the rooms selected for the installation of new F&D equipment. The following conditions shall be defined by the Contractor:

- Normal required flow
- Maximum required flow

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Instrument and service air supply conditions are as follows:

- Operating pressure = 0.5 MPa

Electric Power Supply

The main characteristics of the power supply provided by the Employer to the new F&D facilities including power supply to the PLC SIMATIC and instruments will be the following:

- Available source of electricity: 3x100 kW/400 V, 3 phases.

As part of the Contract, the Contractor shall connect the new or relocated equipment to the corresponding (new/ modernized existing) electric power distribution and power lines to comply with new facility requirements. In line with STN 33 2000-5-51:2007, the Contractor shall elaborate the external influences on the electrical equipment, and classify these electrical devices according to Regulation No. 508/2009 Coll. as restricted devices into group A or group B, as well as classify all high-capacity DL facilities and facilities affected by this Technical Specification according to the external influences on the electrical equipment. Replace all unsatisfactory electrical distributions according to their categorization into class A and B.

The power supply source for consumers without a category of power supply importance will be the existing container switchboard located in the reactor hall with an output of 3x100kVA/ 400V. Eventual consumers of a higher power supply category have to be dealt with individually. Supply cables will be yellow and marked along the route according to JAVYS conventions [32].

Ventilation Extraction

Exhaust systems of equipment, where aerosol formation is expected, shall have their own exhaust unit (exhaust blower), a suitable ventilation filter resistant against the media used at the given workplace and the capacity of the systems shall be adjusted to the existing ventilation system.

Aerosol volume activity shall be continuously measured behind the filtration to check the filtration efficiency. This measurement has to be compatible with existing JAVYS equipment.

The ventilation extraction interfaces will be located in points inside the rooms selected for the installation of new F&D equipment. The exhaust systems of the equipment shall be appropriately connected with these points, for which purpose the mobile equipment shall be provided with the necessary flexible fittings and the connection points prepared so as to ensure airtight connections.

The following conditions shall be defined by the Contractor:

- Normal required flow
- Maximum required flow

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The Tenderer shall offer in his Bid a specific type of equipment and its specific parameters which are in compliance with the following technical requirements (see Chap. 5.2).

Table 1	
Contractor's Duties	Employer / Engineer Duties
1. Project Management and Organization	
<p>Organization of all meetings (site kick-off meeting, progress monthly meeting, working weekly meeting and specific meeting at the request of one party) and development of the reports</p> <ul style="list-style-type: none"> • Overall project co-ordination during all project phases • Management of interfaces between the Contractor and Employer through the upgraded Interface Control Manual (ICM) • Development and updating of the Summary Programme containing all project manuals and the Integrated Base Time Schedule • Development and updating of the time schedule of the documentation for obtaining the permissions and consent of Slovak supervisory and state authorities, of its <hr/> <p>submission, of the development of a Detailed design and procurement time schedule</p> <ul style="list-style-type: none"> • Development and updating of a detailed construction time schedule (civil works and erection) • Development and updating of a detailed test and commissioning time schedule. • Development of the monthly reports 	<ul style="list-style-type: none"> • Leading role in all meetings (site kick-off meeting, progress monthly meeting, specific meeting at the request of one party) • Review and control of the execution of all the contractual provisions, as well the time schedule and manuals.



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2. Kick-off Meeting on the Site	
<p>Organization of the kick-off meeting, including the visit to the site:</p> <ul style="list-style-type: none"> • Discussion/clarification of technical questions • Discussion/clarification of project interfaces • Organizational agreements • Arrangement of the Input Data supply • Confirmation of the basic time schedule • Risk management discussion • Submission of a list of the Contractor's main works to obtain the license for working orders in the JAVYS, a.s. database • Submission of a list of employees to obtain identification cards (IK) • Submission of the employee list including IK and numbers of vehicles in order to obtain entrance permits to required Objects. <p>Organization of monthly progress meetings:</p> <ul style="list-style-type: none"> • Discussion on work progress • Schedule evaluation, evaluation of • modifications compared to the original project documentation, approvals and schedules. 	<ul style="list-style-type: none"> • Provision of organizational support to the Contractor's experts for achieving objectives of the delegation. • Supply of identification system (names and numbers) of relevant process systems (PS) and /or process subsystems (DPS) • Development and delivery of an identification system (names and numbers) of relevant buildings (SO).
3. Engineering Documentation	
<ul style="list-style-type: none"> • Inception report • Project Quality Assurance Plan • Development of the Health and Safety Plan in compliance with the Slovak government Decree No. 396/2006 Coll. • Development of documentation required by Slovak authorities for issuing permissions and concessions : 	<ul style="list-style-type: none"> • Review and approval of the Documentation • Submission of the documentation to the relevant Authorities • Provision of the necessary input data. • Review and approval of the detailed design and of the accompanying documentation.
<ol style="list-style-type: none"> 1. Preliminary environmental study in accordance with Article 22 of Act No. 24/2006 Coll. [8] 2. Environmental Impact Assessment report [8] 3. Documentation related to the project according to Annex 1, parts B and C of Act No. 541/2004 Coll., mainly the modification of Safety report including 	



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the determination of possible events, failure condition and possible consequences thereof (risk evaluation) including proposals for operation limits and conditions.

4. List of classified equipment including their categorization according to Regulation No. 50/2006 Coll.
5. Quality plans in accordance with Regulation No 56/2006 Coll. and Act No. 541/2004 Coll., which shall be developed 2 months before the start of the implementation. Note: The Quality Plan should be developed and approved even before the Project Implementation Documentation is prepared, as it may occur that the UJD will not approve the proposed classified equipment.
6. List of restricted technical devices according to Regulation No. 508/2009 Coll.
7. Development of documentation according to Act No. 355/2007 Coll., article 13, paragraph 5 and article 45, paragraph 2, letters a) and k)
8. Documentation necessary for the issuance of the building permit pursuant to Act No. 50/1976 Coll. in accordance with article 8 of Regulation No. 453/2000 Coll. [28] (in the scope of the detailed design documentation specified in the rate book UNIKA, Annex 4, [7]) and ensuring its approval by the Technical Inspection authority pursuant to Act No. 508/2009 Coll.
9. Documentation in accordance with article 21 of Regulation No. 453/2000 Coll. [28] necessary for the issuance of the decision on accepting the change in the use of the building
10. Documentation necessary for the issuance of the house inspection



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certificate in accordance with Article 17 of Regulation No. 453/2000 Coll. [28] (As Built documentation in accordance with clause 12 – Commissioning and testing of this table)

- Elaboration of the hand-over programme (see point 12)
- As built documentation
- Operational procedures
- Design documentation shall be elaborated by licensed designers according to Act No. 138/1992 Coll. [29]
- Assistance to the Engineer by providing information/data and documentation for Project Risk Assessment Analysis
- Support to the Engineer for obtaining approvals, permissions and/or decisions of Regulators, including the building permit and house inspection certificate
- Erection Programme. All operational constraints and requirements, building permits, interfaces, preparation requirements, time duration and alternative arrangements, if needed, shall be defined
- Elaboration of the Dismantling Programme of obsolete equipment which will contain the chapter: "Production and collection of waste" describing waste classification in accordance with Decree No. 284/2001 Coll. and the chapter "Radiation Protection" (with an estimate of the personnel dose load)
- Elaboration of the Programme for the installation of new equipment, which will also contain the chapter "Radiation Protection" (with an estimate of the personnel dose load)
- Incorporation of the necessary changes into the detail design originated through the review by the Employer and the regulatory authorities
- Development of the procurement and manufacturing packages (documentation)

4. Scheduling	
• Development of project schedules.	• Schedules reviewing.
5. Certification Process	
• Obtain equipment certification from the	



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<p>State Authorities</p> <ul style="list-style-type: none"> • Certificate (equipment certificate/identification plate) for classified materials and equipment (if required) • Equipment (type) certificate • Equipment compliance certificate according to Act No. 264/1999 Coll. 	
6. Procurement and Manufacturing	
<ul style="list-style-type: none"> • Purchase of the equipment • Quality Control (QC) Surveillance • Manufacturing and transport of the equipment to JAVYS, Bohunice site in accordance with the scope of equipment supply • Final Manufacturing Report. 	<ul style="list-style-type: none"> • QC Surveillance • Checking of material stock • Review of the Final Manufacturing Report.
7. Delivery	
<ul style="list-style-type: none"> • Packing and marking of the material and equipment • Storage of the materials and equipment. 	<ul style="list-style-type: none"> • Support regarding delivery and storage at the NPP site. The individual places shall be approved by the Employer.
8. Dismantling and demolition	
<ul style="list-style-type: none"> • Development of dismantling data (if any) • Dismantling and demolition (if any) of the existing civil /mechanical parts and networks on the V1 NPP site • Delivery of the dismantled equipment and material to the place specified by the Employer • The Contractor shall have the responsibility for the management of all dismantled and demolished material. The Contractor will dispose these materials in the places assigned by the Employer. 	<ul style="list-style-type: none"> • Review of the dismantling data • Supervision of the dismantling and disposal works • Supervision of the dismantling works • Specification of the place for disposal of dismantled equipment and demolished material , as specified in the Contractor Duties, point 9.
9. Installation and Erection Works	
<ul style="list-style-type: none"> • Earthworks, reinforcement, steelwork, concreting • Civil finishing works • Technological equipment installation • Electrical and I&C equipment installation • Electrical diagrams • Cable installation and connection • Inspection and testing report according to Regulation No. 508/2009 Coll. (SOPOS) • Quality Plan in accordance with the Regulation No 56/2006 Coll. and Act No. 541/2004 Coll., shall be evaluated after 	<ul style="list-style-type: none"> • Obtaining the state authority's permission for installation works (if required) • Surveillance of the erection and installation works • Provision of electricity, water and compressed air with the necessary connections for the erection and installation based on the Contractor's request in writing pursuant to the Contract (Vol.III.v., Form: Services requested by the Contractor) • Handover of the construction site for the works



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completion of the installation	<ul style="list-style-type: none"> Review of manuals and operational procedures.
10. Training	
<ul style="list-style-type: none"> Preparation of detailed training programmes (training documentation) Training of the final user personnel 	<ul style="list-style-type: none"> Review of the training programme Trainees selection Training participation.
11. Commissioning and Testing	
<ul style="list-style-type: none"> Delivery of the As Built Documentation according to the requirements that were included within the scope of the rate book UNIKA, Appendix 4. The Accompanying Technical Documentation divided according to the Civil Structure system (SO) stated in the Detailed Design documentation, or according to the operational units (PS-Process system or DPS-Process Subsystem) in terms of the requirements of JAVYS, a.s., valid on the date of handing over the works Delivery of the Accompanying technical documentation in accordance with Reg. No 56/2006 Coll. and Reg. No 508/2009 Coll. Delivery of geodetic documentation i.e. geometrical drawings and survey of As built Documentation for the House inspection and delivery of the lay-out plan and topographic plan of the above ground and underground objects Assistance to the Employer during the House inspection Participation on the House inspection Development of the commissioning programme, including the related Pre-commissioning and Commissioning Tests Pre-commissioning Tests Issuance of the Final Protocol of the Pre-commissioning Test In-house inspection Commissioning Tests according to chapter 6.3. Issuance of the Final Protocol of the Commissioning Test Applying for the Taking-over Certificate Submission of the documentation for Guaranty tests Development of the Final Commissioning Report Development of the Final Report. Provision of operation and maintenance 	<ul style="list-style-type: none"> Review of the Documentation Trial Operation Application development Submission of the House inspection proposal Development of the Technical decision on Commissioning Review of the commissioning programme and related tests Supervision of the tests, approval of the test results Supervision of the Commissioning works Notification to the Contractor if problems arise on the equipment or its interfacing with the existing systems Acceptance of the In-house inspection Issuance of the Taking over Certificate Issuance of the Performance Certificate Acceptance of the Contract Final Report.



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<p>manuals</p> <ul style="list-style-type: none"> • PPP - Operating procedures, calibration methodology, attestation for "assigned" measuring equipment • Elaboration of a risk assessment and operating instructions for the protection of personnel against the risks related to noise exposure (Article 3 of Governmental Decree No. 115/2006 Coll. [31]) • Elaboration of a risk assessment and operating instructions for the protection of personnel against the risks related to the exposure to chemical agents (Article 4 of Governmental Decree No. 355/2006 Coll. [30]) 	
<p>12. Defects notification period</p>	
<ul style="list-style-type: none"> • Supervision during the first/regular maintenance of the equipment • Execution of the Contractor's activities within the warranty period • Defects and damage repairs • Performance Certificate. 	<ul style="list-style-type: none"> • Notification of defects.
<p>13. Other Services</p>	
<ul style="list-style-type: none"> • Travelling, accommodation and boarding of the Contractor's personnel on the site • Waste transportation and handling • Waste disposal, except for waste utilizable as secondary raw material, listed in the Tender Dossier part: Volume III.V, point 7m. "Site Accessibility Requirements-Conditions for Contractors" • Elaboration of a list of spare parts and a list of consumables. 	

4. DESIGN LIFE

All equipment and installations comprised in the new F&D facilities shall be designed and appropriately erected as to guarantee the normal operation during 20 years as a minimum, period which includes the scheduled decommissioning duration (approximately 2012-2025).

4.1 DESIGN LIFE AND AVAILABILITY

For the purpose of determining the design life, the new F&D facilities are expected to operate at maximum continuous rating as much as possible during all its operating life. The equipment shall be designed and built for a design life of 20 years. This requirement is not a guarantee value, but shall be used by the Contractor to determine the wear and ageing of components. This shall be used to establish the maintenance procedures and component replacements required to achieve the 20-year design life (see section 5.4.1 - Spare Parts).

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4.2 COMPONENT RESIDUAL LIFE

The Contractor shall consider that no major life extension work shall be required during the design life and therefore those components shall not be designed for repair during the life cycle period.

The Contractor shall provide recommendations in the operating and maintenance manuals on improving the residual life of those components, such as limitations on operating modes, process fluid characteristics, lay-up procedures, etc.

The Contractor shall also indicate specific inspection procedures to be followed to monitor the degradation conditions and residual life of these components.

5. TECHNICAL REQUIREMENTS

5.1 MAIN REQUIREMENTS

The new large-capacity F&D facilities shall be designed, installed, commissioned and operated in accordance with the requirements of the entire Slovak regulations, codes, standards and the requirements of this technical specification.

All the equipment, devices and materials shall be new, unused, of the most recent current models. The design of all components shall incorporate all recent improvements unless otherwise provided in the Contract. All equipment and systems shall be compatible with the interfacing equipment and systems.

The Contractor shall design both the fragmentation and the decontamination lines. The both processing lines shall be designed as to minimize the secondary RAW production.

The processing capacities of each one of these lines shall be defined on the basis of the total required RAW treatment capacity, as specified in section 5.1.2. The total RAW treatment capacity and the location in the rooms in which the equipment will be installed shall be considered as main technical requirements in the design process.

The design shall consist at least of civil (room preparation), mechanical, and electrical parts. It will be approved by the Employer and by the Regulator (NRA). The new large-capacity F&D facilities shall be designed in a way that minimizes the spread of contamination and aerosols at the workplace and radioactive discharges (effluents collection and storage, evacuation, filtering, and efficiency control). Appropriate means, as for example steel lining and equipment covers or airtight containments shall be provided for controlling the liquid and gaseous discharges.

The Contractor shall consider all needed provisions for temporary storage spaces for incoming waste, as well as storage for the materials necessary for the radwaste processing. The flow of all materials shall be appropriately defined, taking into account the previous mentioned issues and the equipment proposed to be installed.

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The design documentation shall be developed in accordance with Appendix 4. It will be approved by the Employer and will be submitted to the Regulator (NRA). The detailed algorithms of work shall be included in the documentation.

For each of the treatment technology described in the section 5.1.5, the Contractor shall provide all the necessary equipment in compliance with the requirements of this Specification (sections 3-Scope, 5.2-Components Design Requirements) and in conformity with the basic parameters specified in the Data Sheets.

The Contractor shall develop the safety documentation and perform connection of the new equipment with adequate exhaust and service supplies as a part of the Contract. The Contractor shall evaluate dangers and risks that cannot be eliminated and arise out of the proposed solutions, assess the risks (including the risk of explosion) and propose protective remedial measures.

The design, the proposal of machines and technical equipment shall include also information on their safe location, installation, operation, inspection, maintenance and repair (§ 4 of Act No. 124/2006 Coll. on occupational safety and health).

A part of the design documentation shall be the preparation of a written document on protection against explosion (§ 7 of Governmental Ordinance No. 393/2006 Coll. on the minimum requirements imposed upon the provision of occupational safety and health in an explosive environment).


5.1.1 General Design Requirements

In the design, implementation and commissioning phase, the requirements stated in chapter 5.8 Legislative Requirements shall be met.

The new F&D facilities shall comprise facilities for decontamination of metallic materials (SS/CS), facilities for decontamination of construction surfaces, equipment for segmentation and fragmentation of the technological devices, and manipulation means, as specified in this specification.

The following requirements shall be met during the design of the new F&D facilities:

- Radiological limitations of the solid, liquid and gaseous discharges into the environment
- Chemical control of the liquid and the gaseous discharges into the atmosphere
- Process control over all the activities providing for:
 - The quality of the outcome stream of treated material and of the secondary wastes
 - Compliance of the systems with their design characteristics
 - Registration of all the parameters needed for the control of the processes and the equipment
 - Protections and interlocks during all modes of operation
 - Provisions for connections with local ventilation systems of the areas/premises

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The design shall also provide:

- The estimate of the personnel required for operation (by specialities) in case of one shift operation
- Estimate of the necessary daily consumables (including service gases)
- Technical manuals of the new F&D equipment operation.

5.1.2 RAW Treatment Required Capacity

For the purpose of determining the RAW treatment capacity it is considered, that the F&D facilities (fragmentation and decontamination lines) will operate in one shift (8 hours per day). All systems comprised shall operate appropriately during the required period of operation.

The required capacities of fragmentation and decontamination equipment are listed in Table 5.1-1 for smooth treatment of the main streams of material from the decommissioning of the V1 NPP (besides reactor parts). The whole amount listed in the table is the maximum, because probably part of these materials will not be subject to any fragmentation process and other parts will not require decontamination.

Table 5.1-1: Required capacities of fragmentation and decontamination equipment for different kind of materials

	Material		
	Stainless steel	Carbon steel	Electro wiring
Sum total	4 818 t	4 664 t	285 t
Required yearly output	650.4 t	629.6 t	38.5 t
Capacity	2.50 t/shift	2.41 t/shift	0.15 t/shift

Table 5.1-2 lists the required capacities of equipment for decontamination and individual types of construction surfaces. The whole amount listed in the table is the maximum, because probably part of these surfaces will not need to be decontaminated.

Table 5.1-2: Required capacities of decontamination equipment for individual types of construction surfaces.

	Construction surface			
	Peripheral walls		Lining	
	Building panels	FEAL	Stainless-steel	Carbon-steel
Total area	10 650 m ²	8 000 m ²	23 237 m ²	7 312 m ²
Required yearly output	2 130 m ²	1 600 m ²	4 647.5 m ²	1 462.5 m ²
Capacity	8.16 m ² /shift	6.13 m ² /shift	17.8 m ² /shift	5.6 m ² /shift

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5.1.3 Final Decontaminated and Fragmented Materials (Products) - Requirements

It shall be possible to place stainless steel fragments in the 600 x 1800 x 600 mm titanium decontamination basket. It shall be possible to place carbon steel fragments into the blasting device with a volume of approximately 1000 litres. The weight of a single piece shall not exceed 150 kg.

Components which will not be decontaminated, but will be further processed with some other method (melting, high pressure compacting, etc.), shall be divided into fragments that can be placed horizontally into the 200 l drums with a diameter of 0.6 m and a height of 0.80 m.

5.1.4 Characteristics of RAW to be Processed

RAW materials to be considered in the design of the new F&D facilities are Low and Intermediate Level Waste from the Nuclear Power Plant [2]. The Contractor shall consider these characteristics and, based on his experience, propose the most appropriate design for the required F&D facilities.

In the event that it is deemed necessary to carry out other analyses, the Contractor shall assume the cost and responsibility for them.

5.1.5 RAW Treatment Technologies

5.1.5.1 Decontamination


The purpose of post-dismantling decontamination is to decrease surface contamination to such level that allows the materials to be released into the environment under the legislation valid at the time of implementation or to the level for chosen disposal.

The method of electrochemical bath decontamination supplemented by cleaning in ultrasound baths and high-pressure water jetting shall be used for decontamination of stainless steel materials. To remove the hot spots, it will be acceptable to use mechanical processes (semidry electrochemical decontamination, grinding, and blast cleaning by abrasives).

The installation to be purchased and installed by the Contractor for the decontamination of stainless steel materials shall be a complete decontamination line (DL).

The decontamination line shall be provided with means that allow the preparation and pumping of the decontamination solutions, filtering and regeneration of used solutions, handling of decontaminated material, operational contamination measurements of material, process check, separation and transfer of produced RAW to the secondary RAW treatment facilities.

The Contractor shall equip the rooms, where DL equipment will be installed, with connections to the following service supplies:

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- Electric power
- Water
- Air exhaustion system
- Drainage of active liquid media
- Compressed air

5.1.5.2 Dry Mechanical-Abrasive Blasting

The main method for decontamination of surfaces made of carbon steel shall be a dry abrasive blasting of fragment surfaces. The purpose of this approach is the removal of surface layer (protecting paints, corrosion layer) to the base material.

Dry abrasive-blasting techniques, as specified in this document, shall be used for the prior removal of materials such as oil, grease, oxides (rust) and paint or other coats in order to guarantee the effectiveness of the electrochemical decontamination process which may be limited by the presence of adhering materials on the surface of the items to be decontaminated.

All facilities/equipment to be provided for this purpose must be equipped with an exhaust system with adequate filtering module). The equipment shall have capability to remove any tightly adherent material, including corrosion layers.

The necessary equipment shall be installed in rooms, which will be equipped with the following supplies:

- Electric power
- Air exhaustion system
- Compressed air


The workplace shall be also dispatched with handling desks, electric hoists, fork-lift trucks and hand pallet trucks.

5.1.5.3 Construction Surface Decontamination

The construction surfaces will be decontaminated after the dismantling of the technological equipment. The equipment for decontamination based on mechanical-abrasive method to be provided shall be equipped with exhaust systems with adequate filtering module. Different decontamination methods for different types of construction surfaces shall be used:

Surfaces covered by stainless steel lining

The surfaces covered by stainless steel lining shall be decontaminated at a first stage by mechanical process (high pressure jetting combined with gels, abrasion, etc.) and at a second stage by semi-dry electrochemical decontamination.

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Surfaces covered by carbon steel lining

The surfaces covered by carbon steel lining with epoxy-based primer shall be in restricted range decontaminated by mechanical equipment (high pressure water jetting with exhaust, removal of the paint coat with mechanical-abrasive method).

Construction surfaces with epoxy-based primer

The construction surfaces with epoxy-based primer shall be decontaminated with decontamination foams applied on their surface (geometrically complicated surface) or with high pressure water jet cleaning with exhaust (large flat surfaces). If necessary, local spots or whole surfaces could be decontaminated by dry abrasion of epoxy-based primer, and concrete itself. All facilities shall be equipped with an exhaust system with an adequate filtering module.

Non-protected construction surfaces

The surfaces without lining or epoxy-based primer shall be decontaminated by mechanical abrasion to the necessary depth (5-10 mm). Used facilities shall be equipped by an exhaust system with an adequate filtering module.

5.1.5.4 Segmentation

Segmentation enables the division of large metallic equipment into individual components. The components can be subsequently moved to fragmentation and decontamination facilities.

5.1.5.5 Fragmentation

Mechanical (non-thermal) and partly thermal methods of cutting shall be used to fragment the dismantled technological devices. The size of individual fragmented components to be decontaminated shall meet the requirements for their next processing.

5.1.6 DECOMMISSIONING SECONDARY RAW

The types and compositions of secondary RAW produced in phase of decommissioning shall not be significantly different from wastes which were produced during the operation and reconstruction of the V1 NPP. Secondary decommissioning RAW shall be treated by standard technologies, which are in present time used in JAVYS Inc. (cementation, bituminization, high pressure compacting, incineration).

Presumption of yearly production of secondary RAW in phase of decommissioning of the V1 NPP for individual technologies is listed in Table 5.1-3.

Table 5.1-3: Informative average annual production of secondary RAW during the decommissioning of the V1 NPP

Technology	Solid RAW	Radioactive sludge (20 % of dry matter)	Liquid RAW (*)
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Electrochemical and ultrasonic decontamination	-	1 000 kg	50 m ³
Abrasive shot-blasting	5 500 kg	-	-
Decontamination of building surfaces	4 000 kg	2 000 kg	200 m ³
Dismantling and fragmentation	10 400 kg	-	-

(*) – Non-concentrated liquid RAW

Used electrolyte resulting from the electrochemically stainless-steel decontamination process shall be conditioned (adjustment of pH, sedimentation of insoluble particles, etc.) in tank before its drainage. Conditioned electrolyte shall be drained into the used solutions tank. Settled sludge will be removed into drums in which, it shall be directly immobilized. The Contractor shall adjust the equipment to enable the removal of sedimented sludge to the drums.

Following the shot-blasting carbon-steel decontamination process, the structure of produced secondary RAW will be: spend dry-abrasive medium, removed contamination (protective paints, corrosion layer with radionuclides). Secondary wastes shall be with low activity ($\sim 10^3 - 10^4$ Bq.kg⁻¹) and shall be in dry powdery form. Produced RAW should be treated by high-pressure compacting or cementation.

Assumed amounts of the produced RAW (both types above) are listed in Table 5.1.3

The Contractor shall perform the transfer of waste to the places specified by the Employer in compliance with applicable regulations on RAW management in the controlled area and the same shall apply for the produced secondary waste. The transportation of secondary waste shall be provided by the Employer staff from designated area inside the reactor hall (no more than 100 m from any workshop).

With wet concept of decontamination of building surfaces, secondary RAW will contain used medium (foam solution, water) and removed contamination. In liquid RAW, the liquid phase shall be separated from insoluble elements and shall be drained into the special canalization. Solid particles are treated independently as building waste (high-pressure compacting or cementation).

With dry concept, the layers of building surface will be removed. These RAW shall be collected by a vacuum unit in a preliminary container.

The contaminated debris (i.e., the removed portion of the surface) must be collected, treated and/or disposed off, and any liquids used during the removal process, either as part of the process or as dust control, must be processed / recycled.

Dust and debris shall be captured at the cutting-tool surface, which will minimize cross-contamination. For hand scabblers and smaller systems, dust evacuation may be carried out using industrial vacuum cleaners (capacities of up to 500 m³/h), and equipped with absolute filtering systems at the outlet.

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Larger shaving machines shall be connected to vacuum systems with capacities of up to 2 500 m³/h or higher. They shall incorporate a cyclone to evacuate larger concrete particles, a filtering system with cleanable pre-filters and absolute filter, and a vacuum pump. The cleanable filtering system shall incorporate a fill-seal drum change-out (contamination-free exchange) method that will allow the operator to fill, seal, remove, and replace the waste drum under controlled conditions. The unit may accommodate different drum sizes and several scabblers, shavers and needle scalers at longer distances.

5.1.7 Preparation of Decontamination Solutions

The design of the fragmentation and decontamination lines shall include the proposal (of the composition), preparation and pumping of the decontamination solutions, filtering and regeneration of used solutions, as well as the collection and transport of all produced secondary RAW to the existing plant treatment facilities for further conditioning. Used solution shall be treatable in JAVYS and acceptable for the repository after the final conditioning.

The pumps supplied for decontamination solutions shall comply with all the design requirements indicated in section 5.2.2.

5.1.8 Drains and Effluents

All F&D facilities drains, i.e. equipment drains, sampling points, tanks, etc. shall be kept separate from each other if they cannot be mixed.

All possible drain points, such as discharges of safety valves, rupture disk discharges, sampling points, pump leaks, etc. shall be led to the corresponding collection tank or to the drain network, depending on their characteristics.

The Contractor shall define the general layout of the network, in relation to the general layout of the controlled area and the layouts of the selected rooms.

5.1.9 Instrumentation and Control

5.1.9.1 Instrumentation

The following instrumentation shall be provided as a minimum requirement:

- Pressure transmitters with local indication, in pumps discharge
- Temperature indicators in baths
- Flow transmitters and indicators

5.1.9.2 Control

All F&D facilities control shall be performed by means of PLC SIMATIC with a CPU installed in the local control panel.

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The local panel shall comprise the PLC, the starters and other power equipment and, in the case of the conventional operator-process interface, the control and supervision instruments (control station, indicators, alarm annunciators, etc.). The local operator interface shall be established by means of a 12" colour touch screen.

On the screen, the status of the whole system including individual components and all important parameters and measurements shall be displayed. In the Contractor's design, all signals and measurements needed for trouble-free operation of the system shall be provided.

The automatic control cabinet (which contains the PLC) shall have a front panel with transparent door so that PLC card status can be viewed from outside. The measuring instruments, time meters, etc., shall be installed on the door of the electrical cabinet.

As part of the Contract, the Contractor shall connect the new or relocated equipment to the corresponding exhaust system and verify / modernize the existing electric power distribution and power lines to comply with new facility requirements. In line with STN 33 2000-5-51:2007, the Contractor shall elaborate the external influences on the electrical equipment, and classify these electrical devices according to Regulation No. 508/2009 Coll. as restricted devices into group A or group B, as well as classify all high-capacity DL facilities and facilities affected by this Technical Specification according to the external influences on the electrical equipment. Replace all unsatisfactory electrical distributions according to their categorization into class A and B

It shall be possible to operate the main supply circuit breaker from outside the cabinet by means of a separate handle outside the window (the IP shall be preserved). The requirements of IEC 60439 shall be met. All equipment included in the local panel shall be protected against over voltages, in compliance with IEC 61000 and ANSI/IEEE C37.90.1.

The decontamination line shall be designed for automatic operation, with minimum operator presence. Automatic mode shall be available locally from the touch screen. The main status and measurements shall also be available.

The Contractor shall indicate in his proposal the signals which, in his opinion, are important for the smooth operation of the system.

The supply shall include all software licenses and guarantees required for system configuration, execution and development.

5.2 DESIGN AND FUNCTIONAL REQUIREMENTS FOR EQUIPMENT COMPONENTS

The Contractor shall design, procure, deliver, and install the equipment necessary for post-dismantling decontamination of metallic and building RAW, as specified in this specification and in compliance with the applicable codes and standards. The main technical parameters of the equipment are specified in the datasheets.

The necessary reduction of radioactivity of the materials should not be accomplished only by one decontamination process but could be a combination of some processes. The equipment and

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facilities to be provided, subject of this specification, shall have controlled exhaust capabilities, as specified in this document and in compliance with the applicable codes and standards.

The Contractor shall in its Bid propose the best position of the equipment in the reactor building (building No. 800) based on the optimisation of radiation protection, production of secondary radioactive waste and logistics. Available rooms are: R301 (partially), R215, R110, R112, R117, R033/2, R303/1 and R029/2. Only portable and easily dismountable equipment can be placed in the reactor hall.

5.2.1 Decontamination Line equipment

The baths shall have a uniform design. The lids shall function as a seal. On open baths, the lids shall overlap to prevent the possible contamination of the baths

5.2.1.1 DL Electrochemical Baths

The equipment will be used for the removal of fixed contamination from surfaces of dismantled and fragmented pieces, parts of contaminated devices.

The electrochemical bath shall allow effective reduction of the β - and γ - residual surface contamination of metallic materials below the level of 0.2 Bq.cm^2 , which is the effective limit value for the scrap metals being decontaminated and for their unrestricted release to the environment.

The equipment shall be capable of reducing the surface contamination at a decontamination factor of more than 100, even in the case of geometrically complex structures (e.g. pump internals) within relatively short times.

The electrochemical bath shall rely on high removal rates (more than $1.5 \mu\text{m}/\text{min}$ or $90 \mu\text{m}/\text{h}$), short decontamination times, and smooth surface after treatment of the waste.

The electrochemical decontamination baths shall be with direct current source, which will result in the anodic dissolution and removal of metal and oxide layers from the component. The equipment shall be rectangular in shape and the bottom of the bath shall be optimally inclined in the direction of the outlet, with respect to the shell. The exhaust system shall be a lip exhaust ducting with PVC / FRP.

To control vapours released from the electrolyte during the process, an extraction hood shall be located alongside the electrochemical bath. Provision of heating prior to start-up, cooling during operation, and electrolyte agitation as well as bath rinsing are also required.

The electrolyte system proposed by the Contractor shall be capable of minimizing the volume of secondary waste. The waste solution has to be processable by JAVYS technologies. Provisions are required (filtering and regeneration module) for the recirculation and regeneration of the electrolyte followed by periodic exchange, in order to avoid the increase of the iron content in the acid electrolyte which should not exceed 100 g/l . The bath performance shall be maintained as long as the solution is usable.

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Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	2
Type	stationary
Dimensions	1300 x 2400 x 1000 mm
Material	17 248.4
Shell thickness	approx. 4 mm
Electrolyte	RA decontamination solution
Electrolyte concentration	25%
Decontamination factor	more than 100
Power supply	up to 2700 A

5.2.1.2 DL Ultrasonic Baths

The equipment will be used for final cleaning and decontamination of material from lightly fixed contamination with use of ultrasound after previous electrochemical decontamination. The ultrasonic baths shall be provided and installed, including the ultrasounds generators. Suitably bonded transducers with a capacity of 2 kW shall be also provided.

The equipment shall be rectangular in shape and the bottom of the bath shall be optimally inclined in the direction of the outlet. The exhaust system shall be a lip exhaust ducting with PVC / FRP.

The ultrasonic bath will hold a solvent, diluted nitric acid (25% concentration), or others. The power source sets up high frequency waves with the help of transducers in the bath, which will force the solvent into pores of the subject to be cleaned effectively.

Because of the high frequency waves, the solvent in the bath will be agitated and provide rubbing action. The basket containing metallic waste shall be maintained in the ultrasonic bath for a minimum of 30 min.

Engineering characteristic, construction material and required capacity:

Ultrasonic decontamination baths DL

Quantity (No. of pieces/units)	2
Type	stationary
Dimensions	1300 x 2400 x 1000 mm
Material	17 248.4
Shell thickness	approx. 4 mm
Timer Range	5-200 min.
Frequency	30-40 kHz
Ultrasound power in the bath	6.5 ± 0.5 W/l
Working medium	RA decont. solution
Environment	ionizing radiation
Effective volume of the bath	3 m ³

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Ultrasonic generators and emitters

Frequency

20 per each bath

up to 40 kHz

5.2.1.3 DL Rinsing Bath

After electrochemical and ultrasound decontamination, the basket containing metallic waste will be shifted to the hot water rinsing bath for satisfactory washing of material and removal of residual contaminated material and nitric acid. The rinsing bath shall be provided and installed together with the corresponding water jet. One centrifugal pump is required for the rinsing bath water jetting, complying with all the design requirements indicated in section 5.2.2.

The rinsing bath shall be provided with electric heating coil for maintaining the temp of 60°C. The equipment shall be rectangular and the bottom of the bath shall be optimally inclined in the direction of the outlet. The exhaust system shall be a lip exhaust ducting with PVC / FRP.

Engineering characteristic, construction material and required capacity:

External dimensions of the bath	2400 x 1280 x 1420 mm (l x w x h)
Shell thickness	4 mm
Material	17 248.4
Required pressure of water jetting	1.5 – 2.0 MPa

Accessories of the rinsing bath (tanks, valves, mechanical filter, pumps) must be made of materials resistant to pH 2 – 12

5.2.1.4 DL Baskets

These handling means shall be part of the decontamination line and will be used for transport and correct positioning of items in individual decontamination baths.

The baskets geometry construction shall be rectangular in shape along with the lid, with perforations all-around of 20 mm size. The construction of the basket shall allow stacking them up. Used electro bars will be settled by shorter sides of the basket, aside of the stack (see Appendix 3).

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	7
Load capacity	500 kg weight of the load + (Ti basket)
External dimensions	1280 (with anchors) x 2160 x 700 mm (h x l x w)
Materials	titanium, purity 99.8 % conductive copper rod steel sieve 17 284.4

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5.2.2 DL PUMPS

5.2.2.1 General

The pumps supplied for the same service shall be physically and functionally identical. Pumps shall be designed to withstand sharp temperature changes. At least one pump shall be supplied to each decontamination line bath.

As a rule, the vibration level for all pumps supplied shall not exceed those indicated as "Zone A" in accordance with ISO 7919/10816 standards.

All materials employed in the manufacturing of equipment shall be submitted to the Employer's approval; they shall be suitable for the operating conditions and duty of each pump.

All motor-pump assemblies requested shall be supplied installed on a common base, to which the pump, electrical drive motor and coupling protection will be fixed. The base may be made of rolled shapes provided with drip trays and their associated purge connection.

The pumps shall be equipped with the connections necessary to their smooth operation (including filling, drain, emptying, vent and case drain).

Each pump shall have its nameplate fixed on an easily accessible and visible location. This nameplate shall contain standard information given by the manufacturer.

5.2.2.2 Centrifugal Pumps

The Contractor shall supply pumps with driving mechanisms. The aim of the replacement of the aforementioned pumps with driving mechanisms on the DL is to secure failure-free operation. Gantry type single stage chemical pump according to the standard STN EN 22858.

Engineering characteristic, construction material and required capacity:

Pumps with double mechanical seal and an autonomous barrier circuit	
Working medium	RA decont. solution
Working temperature	10 – 50 °C
Material	DIN 1.4408, or equivalent
Place of installation	decontamination line (DL)

All pumps shall be of the same type.

The corresponding driving mechanisms are not regulated by Regulation No. 50/2006 Coll. regarding the material configuration of active parts of pumps according to DIN 1.4408, or equivalent. The Contractor shall supply pumps in line with STN EN 22858, elastic coupling with

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discs and stainless steel leaf springs, with an adaptor, to facilitate repairs without disassembling the electric motor.

The facilities shall meet the requirements of Regulation No. 50/2006 Coll. and Regulation 56/2006 Coll.

Pumps in general service shall be in accordance with the recommendations of the Hydraulic Institute and be suitable for the intended service and environment where they are installed.

The pump and driver shall be mounted on a common base and connected with a spacer coupling and a coupling guard. The characteristic curve of the centrifugal pumps shall be as close as possible to the service conditions. The maximum output will coincide with the operating point under normal operating conditions.

DL Rinsing bath Pump

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	centrifugal
Material	DIN 1.4408, or equivalent
Working temperature	up to 60 °C
Capacity	0.5 m ³ /h
High pressure water jetting	1.5 - 2.0 MPa

5.2.2.3 Positive Displacement Pumps

Positive displacement pumps for chemical products shall have a design flow margin of 50% over the required flow. They shall be diaphragm or piston in type, adjustable (manually and from the control panel), both in operation and when shut down, between 10 and 100%. The diaphragm, body and valve chest shall be made of materials suited to the fluid being handled.

They shall be equipped with double-ball valves on the suction and discharge sides, and with safety valves on the discharge side with a return to the tank.

Pulsation dampeners and pressure gauges shall be installed in a horizontal section of impulse piping to the pumps.

5.2.3 DL Tanks

The decontamination line tanks will be used for DL utilities as storage of chemical products, preparation of the decontamination solutions and pre-treatment of used solutions. The storage tanks shall be of cylindrical shell with conical bottom and flat top construction type.

The tank for the preparation of the decontamination solutions shall be double walled, with the signalization of leakage. The tank for pre-treatment of used solutions will be used for potential pre-treatment of used solutions.

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DL tanks shall be equipped with the elements and accessories necessary to prevent vapour emissions from escaping and also to prevent humidity from entering if it is harmful to the contents of the tank. Such elements shall not impede the correct operation of the tank vent.

All tanks containing chemicals which may contain solid impurities that could be deposited on the bottom shall be furnished with chemical outlet connections at a level higher than that of the bottom.

As a general rule, tanks shall be designed, manufactured, inspected and tested in accordance with the codes and order preference indicated in Chapter 7 of this specification.

All tanks shall be provided with lifting lugs, inspection openings (if they are closed) and all the connections necessary for the services for which they are designed, which shall include, but not be restricted to, a product inlet and outlet, vent, drain, overflow and instrumentation. A glass level indicator, level transmitter and high and low level alarms shall always be incorporated.

Protection of metal tanks from galvanic action shall be provided. Two grounding pads shall be provided for each tank.

Engineering characteristic, construction material and required capacity:

DL Tank for solutions preparation

Quantity (No. of pieces/units)	1
Type	stationary
Material	DIN 1.4408, or equivalent
Shell thickness	at least 3 mm
Process fluid	decontamination solutions
Productive volume:	0.8 – 1.2 m ³

DL Tank for pre-treatment of used solutions

Quantity (No. of pieces/units)	1
Type	stationary
Material	stainless steel - 17 248.4 (AISI 304L)
Shell thickness	at least 3 mm
Process fluid	used decontamination solutions
Productive volume:	3.0 – 3.8 m ³
Stirrer	vane

The tank shall be equipped with recirculation, an inlet for reagents dosing, a sampling device and a pump.

5.2.3.1 Handling desk

The handling (drying) desk is also part of the decontamination line.

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It is intended for putting the titanium baskets with decontaminated material aside. After rinsing, this material is drained and dried by the natural flow of ambient air. Since the waste shall be rinsed, it is necessary for the upper plate of the desk to be punched (holes with a diameter up to approximately 20 mm). Under the punched plate, drained water must be directed by inclined metal sheet from the entire surface of the desk to the drain opening. This opening must be connected with pipeline or also by the flanged valve to the special stainless canalisation.

The upper part of the desk must have raised side wall, 10 cm high, along the entire periphery. It will be welded onto the desk to the external side at an angle of 45 degrees.

This desk is intended for putting 3 pieces of titanium baskets aside. The desk is dimensioned accordingly

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	stationary
Dimensions	l x w (3000 x 2000) mm, height of upper
raised	side wall will be approximately up to 700 mm
Material	Desk frame (used profiles "I", "U") steel of
plate,	class 11. All other parts (upper punched
	side walls of the desk, lower inclined metal
	sheet under the punched part of the desk, pipe
	and flanged valve) shall be of stainless steel -
	17 248.4 (AISI 304L)
Load capacity	min. 1 000 kg

5.2.4 Dry mechanical-abrasive blasting equipment

5.2.4.1 Suspended blasting device

The Contractor shall supply, install and put into operation a blasting device (2 pcs). The device shall be intended for blasting components, which shall be freely placed into a suspended, shifting and simultaneously rotating basket. Blasting shall be carried out by steel grit and spinning wheels. Blasting shall result in perfectly clean surfaces of materials, everywhere on the materials. The blasted abrasive medium falls through a perforation into a collecting cone, from where it is conveyed into the cleaner for abrasives and finally returned into the abrasives storage bin. The device shall be connected to its own exhaust and recovery devices, which shall empty into the exhaust system. The exhaust and recovery devices shall be equipped with a tight discharge device for discharging dust and worn grit directly into a 200 l MEVA collecting barrel.

Main engineering characteristics and data on the equipment:

Number of pieces	2
Bearing capacity of the basket with waste to be decontaminated	400 - 600 kg
Weight of individual parts	from 1 kg to 50 kg

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Number of spinning wheels	at least 2
Type	stationary
Blasting medium	dry metal shots
Recycling of blasting medium	yes
Cleaning grade	SA 2.5-SA 3

The equipment shall comply with Regulation No. 508/2009 Coll.

Dimensions of the place of installation of the blasting device:

Length	5200 mm
Width	3800 mm
Height	7000 mm

The suction and recovery system shall also be installed in this area.

5.2.4.2 Manual abrasive blasting cabin

The cabin will be used for manual blast cleaning of large and thick objects and shall be provided including all the necessary equipment.

The cabin shall be with a quick-opening front door fitted with a large inspection window and practical side openings. The three manual blasting guns shall be of high efficiency and shall be made of an abrasive-resistant material and provided with a nozzle made of a special hard metal.

The cabin shall be with built-in self-cleaning dust filters (the filter bags shall be provided) and also with an automatic system for recovering and recycling abrasive material after the separation of dusts deriving from the blasting process.

The abrasive media shall not be toxic and it shall not cause any materials to detonate or generate dust explosions.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	stationary
Dimensions	cca. (8000 x 5 000 x 6 000) mm
Antiabrasive modification of surface	yes
Handling desk	yes
Number of guns for manual abrasive blasting	3

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5.2.5 Construction surfaces decontamination equipment

5.2.5.1 Super High-Pressure Water Pump

The equipment will be used for cleaning (shaving) of contaminated concrete floors and walls. The device shall be an easy maintenance and easy operation device.

The high-pressure water pump shall be provided with jetting-suction accessories and including a vacuum unit and exhaustion and filtration system. Jetting accessories may include rotating nozzles, pipe cleaning nozzles, chemical injectors and sand injectors, etc.

The equipment shall have a relief valve to protect from over pressuring, a system valve to allow running the pump under "no load" until pressure is needed, a pressure read-out (e.g., a gauge), and automatic shutdown features.

Engineering characteristic and required capacity:

Quantity (No. of pieces/units)	1
Type	mobile
Design pressure	approx. 250 MPa
Driving unit	Diesel approx. 50-60 kW

5.2.5.2 Floor Shaving Device

A device will be used for the decontamination of the concrete floors by dry shaving method, including any embedded metals from floors, ceilings and curved surfaces. The equipment shall be provided with exhaustion and filtration systems so as to enable that the removed material be exhausted and captured in filtration unit.

The device shall be an easy maintenance and easy operation device. It shall rely on high cutting depth precision in order to eliminate the need for reworking and multiple passes and minimize the waste produced.

The equipment shall have a quick-change diamond-tipped rotary cutting head designed to give a smooth-surface finish, easier to measure and ready for painting. It shall be capable of cutting through bolts and metal objects, which would damage the scrubbing head of a traditional scabble.

A remote-controlled diamond wall-shaving system shall be provided for concrete decontamination of larger surfaces. The machine shall consist of:

- A remote-controlled hydro-electric power pack for the remote-controlled shaving unit
- Vacuum systems to fix temporarily vacuum pads holding the horizontal and vertical rails of the shaving unit
- A simple xy-frame system containing a guide rail, a vertical rail and a carriage for the shaving head

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- A quick-change diamond-tipped rotary shaving head with dust-control cover for connection to existing dust-extraction systems

The entire system shall be built up in sections portable by one operator. It shall remove a concrete layer in a controlled and vibration-free manner with the removal depth being controllable between 1 and 15 mm per pass, and producing a smooth-surface finish.

The cutting head shall be designed to follow the contours of the surface being removed, and depth adjustments may be set manually in increments of 1 mm to minimize waste production. With 300 and 150-mm-wide shaving heads, both large areas and awkward corners may be accessed. When the vertical rail is fitted to the wall with the cutting head shaving, the horizontal rail may be disconnected and moved forward, thus ensuring continuous operation.

The floor shaver shall be provided in conjunction with a portable HEPA filtered vacuum recovery unit to enable the collection of the contaminated dust and debris and eliminate airborne contaminants.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	mobile
Layer thickness	2 mm
Depth control accuracy	1 mm
Width of shaving heads	300 and 150 mm
Production rate	2-7 m ² /h

5.2.5.3 Foam Generator

A device will be used for the decontamination of complicated building surfaces covered by a protective paint, contaminated by dust particles and oils and for other places where the high-pressure water jetting cannot be applied. The device shall be equipped with a wet vacuum unit and with foam-breaking accessory.

The system shall be capable to achieve a significant effluent volume reduction. It shall be an air-powered fully mobile system providing a significant wide range of deployment opportunities.

The foam system shall demonstrate a considerable capacity for removing particulates and residual liquors from within plant vessels and pipes.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	mobile
Reservoir volume	0.01 – 0.03 m ³
Inlet air pressure	0.4 – 0.7 MPa
Air consumption:	8-15 m ³ ·h ⁻¹

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5.2.5.4 Breaker Hammer

Equipment will be used for decontamination of the concrete floors and walls by dry cut-out, in areas where contamination has penetrated deeply into the concrete surface, increasing the decontamination possibilities and reducing significantly the workload for the operators.

The equipment shall be an electrically-powered, hands-on device Cut-out material shall be exhausted and captured in filtering unit.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	portable
Impact energy	cca. 20 J
Impact frequency	up to 2200 b/m
Weight	8 - 15 kg
Input power	1000 - 2000 W

5.2.5.5 Angular Grinding Devices

Hand devices shall be designed for the decontamination of the floors, walls, and ceilings of the rooms (covered by protective paints) by the dry abrasion (shaving). The equipment shall be provided with air exhaustion. The removed material shall be exhausted and captured in a filtering unit.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	5
Type	portable
Work output / work shift	6 – 10 m ²
Layer thickness	2 mm

5.2.6 Segmentation and Fragmentation equipment

5.2.6.1 Self-Tightening Tube Saw "Guillotine"

The Contractor shall supply and install an automatic self-tightening tube saw with remote control and hydraulic drive and feed, for mechanical (non thermal) cutting of pipes, supports and other material.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	2
Type	portable
Diameter of cut piping	(1) - 50 to 300 mm (2) -250 to 610 mm

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5.2.6.2 Orbital Cutter for Pipes

Equipment will be used for mechanical (non-thermal) cutting of piping, as the cutting tool moves around the outside circumference of a segmented component. The cutting device shall be automatic, self-tightening with remote control.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	2
Type	portable
Diameter of cut piping	(1) - 350 to 510 mm (2) - 200 - 500 mm

5.2.6.3 Hydraulic Shears

Equipment shall be purchased and installed by the Contractor for shearing of metal materials (pipes, bar material, metal plates, etc.) and electrical cables. The device shall include the source of the pressurized oil and pressure hoses.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	2
Type	portable
Max. grip	(1) - 100 - 200 mm (2) - 190-250 mm
Max. shearing profile	(1) - Φ 30 mm (2) - Φ 35 mm (solid section), 48 mm for cables
Power supply	electrical
Power transmission	hydraulic

5.2.6.4 Cable Saw

Equipment will be used for horizontal as well as perpendicular cutting of oversized components (e.g. cylindrical tanks), piping and reinforced concrete (up to 2 m thick).

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	portable
Length of diamond cable	10-20 m
Cutting speeds (of cable)	20 and 25 m·s ⁻¹
Integrated cooling equipment	yes

5.2.6.5 Power Nibbler

Hand-held electrical equipment will be used for shearing of metal materials with minimal distortion, removing small bits of metal.

Engineering characteristic, construction material and required capacity:

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Quantity (No. of pieces/units)	1
Type	portable
Thickness of shearing material	0 - 10 mm
Power supply	electrical

5.2.6.6 Angular Grinding Devices

Manual electrical equipment will be used for cutting of low contaminated thin-walled metal materials. The equipment to be provided shall be with air exhaust.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	3
Type	portable
Weight of tool	max. 5 kg
Power supply	electrical
Grinding disk diameter	min. 200 mm

5.2.6.7 Electrical-Hydraulic Cable Cutter

Hand equipment will be used for shearing of copper and aluminium cables without armoured cladding. The shearing head shall rotate 360°. The cutter shall be equipped with a two-stage hydraulic system with an electrical control.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	2
Type	portable
Shearing power	40 - 60 kN
Max. diameter of sheared cables	Φ 48 mm
Shearing time	10-25 sec. (depending on the cable size)
Power supply	battery fixed connection to grid 220 V
Weight	max. 5 kg

5.2.6.8 Hydraulic Band Saw for Transverse Cutting

This device shall be designed for transverse fragmentation of different kinds of metal materials, e.g. pipes, sectional steel, materials with high firmness and hardness, up to a diameter of 500 mm. The device shall be capable of working in semi-automatic mode.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	stationary (easily dismountable)
Cut length	4 - 560 mm
Cutting speed	10 - 70 m.min-1

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Weight of machinery	3000 - 8000 kg
Cooling	system with the possibility to switch between the emulsion cooling system and micro-lubrication using oil mist

Provision of collection and filtration of chips.

The band saw will be provided with equipment for handling fragmented materials.

5.2.6.9 Hydraulic Band Saw for Lengthwise Cutting

This device shall be designed for the lengthwise fragmentation of different kinds of metal materials, e.g. pipes, sectional steel, materials with high firmness and hardness, up to a diameter of 500 mm. The device shall be capable of working in semi-automatic mode.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	stationary (easily dismountable)
Cut length	4 – 560 mm
Cutting speed	10 - 70 m.min ⁻¹
Weight of machinery	max. 6000 kg
Cooling	system with possibility to switch between the emulsion cooling system and micro-lubrication by oil mist

Provision of collection and filtration of chips.

The band saw will be provided with equipment for handling fragmented materials.

5.2.6.10 Stationary Hydraulic Shears

This equipment will be used for shearing of sectional steel.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	stationary (easily dismountable)
Length of shearing knives	700 - 1100 mm
Max. shearing grip	450 - 1000 mm
Max. force	at least 3000 kN
Weight	max 3000 kg

5.2.6.11 Hydraulic Band Saw

This device shall be designed for transverse fragmentation of different kinds of metal materials, e.g. bars, pipes, sectional steel, materials with high firmness and hardness, up to a diameter of 1000 mm. The device shall be capable of working in semi-automatic mode.

Engineering characteristic, construction material and required capacity:

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Quantity (No. of pieces/units)	1
Type	stationary (easily dismountable)
Cut length	5 - 1000 mm
Cutting speed	12 - 70 m.min-1 adjustable
Weight of machinery	5000 – 14000 kg
Cooling	system with possibility to switch between the emulsion cooling system and micro-lubrication by oil mist

Provision of collection and filtration of chips.

The band saw will be provided with equipment for handling fragmented materials.

5.2.6.12 Plasma Arc Cutting Device

This equipment will be used for thermal cutting of low contaminated components made of stainless steel (if there is no possibility of using mechanical methods). It shall be provided with mobile exhaust and filtering system.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	portable
Thickness of cut material	10 - 50 mm
Quantity (No. of pieces/units)	1
Type	stationary
Thickness of cut material	10 - 50 mm

5.2.6.13 Flame Cutting Device

This device will be used for thermal cutting of low contaminated equipment made of carbon steel (if it is not possible to apply mechanical procedures for their fragmentation). The set shall be able to cut metal materials at a minimum temperature of 5500°C. The set must be able to cut all metal materials including armour.

The equipment shall be provided together with pressure cylinders with technical gases and shall offer the possibility of connection to the existing air exhaust system.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	portable
Thickness of cut material	10-120 mm
Quantity (No. of pieces/units)	1
Type	stationary
Thickness of cut material	10-120 mm

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5.2.7 Handling equipment

5.2.7.1 Trucks

The Contractor shall purchase and deliver 2 front high-lift accumulator trucks with a protective frame to be used for manipulation in the turbine hall and constricted storage areas [26].

Essential technical parameters and data on equipment:

Load capacity	2000 - 3000 kg
Number of axles	2
Number of wheels	4
Accessories	forks, charger hydraulic device for the transportation and emptying of 200 l MEVA barrels to the front
Maximum construction height of the truck Tower with free hoist	up to 2300mm
Propulsion	electrical
Spare batteries	2 pieces
Chargers	2 pieces

The Contractor shall purchase and deliver 2 low-lift accumulator trucks. Essential technical parameters and data on equipment:

Load capacity	1500 - 2000 kg
Lifting height	1500 - 2000 mm
Fixed forks, length	1000 - 1500 mm
Propulsion	electrical
Spare batteries	2 pieces
Charger	2 pieces

The Contractor shall purchase and deliver 1 electric stair climber sack truck (easy lift). Essential technical parameters and data on equipment:

Load capacity	320 - 500 kg
Height	1200 - 1500 mm
Propulsion	electrical
Spare batteries	1 piece
Charger	1 piece

5.2.7.2 Lift

The new lift will serve for transports of materials on fragmentation and decontamination workstations in transport containers.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	stationary
Load capacity	2000 kg
Transport height	12 m

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Loading space 2 x 2.5 m +/- 15% is acceptable

5.2.7.3 Manipulator

Equipment shall be designated for the charging and withdrawal of transport containers into/from the new lift to be installed. By the forklift truck the container with fragmented material will be put on the manipulator, and manipulator will supply horizontal movement of the container to the cabin of the lift.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	stationary
Load capacity	700 kg

5.2.7.4 Handling Platform

The equipment shall be designated for transportation of containers and other material in the workstation.

Engineering characteristic, construction material and required capacity:

Quantity (No. of pieces/units)	1
Type	mobile
Install. location (room)	Room R112 (+2.7 m)
Load capacity	700 kg
Upward stroke	min. 1 m

5.2.7.5 Overhead crane


The Contractor shall supply 1 electrical overhead crane into room R301. The crane shall enable waste transport within the reactor hall and to the train corridor under this hall. The crane shall include a self-supporting mobile structure (wheels). Essential technical parameters and data on equipment:

Load capacity	2000 kg
Width	2500 mm
Length of the structure	7500 mm

5.2.7.6 Modifications of the lift in the shaft no. R 029/2

Lift shall be modified as to be designated for transports of materials on fragmentation and decontamination workstations in transport containers. Performing the needed modifications shall permit that the entrance in to this lift in the Reactor hall.

Engineering characteristic, construction material and required capacity:

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Quantity (No. of pieces/units)	1
Type	stationary
Install. Location (shaft no.)	R 029/2
Load capacity	2000 kg
Loading space	2 x 2.5 m

5.2.7.7 Crane scales

Handling means shall include the supply of 5 pieces of crane scales with weighing capacity up to 1000 kg.

5.2.7.8 Hoists

To locations, where it is not effective to use available handling means, the Contractor shall provide suitable hoists and gripping means in order to ensure the functionality of all equipment.

5.3 INSTALLATION REQUIREMENTS

Construction and installation works for all the parts shall be performed on the Bohunice site and the Contractor shall observe all relevant instructions and rules applicable to this site.

Suitable space to locate the new F&D equipment is available within the controlled area of V1 NPP. The essential advantages of this place of installation are the closeness of placement from all of the sources of RAW production, and minimal construction costs of new buildings for the installation of this equipment (only partial construction modifications shall be necessary to be provided by the Contractor).

The design of all the modifications shall enable transportation of the new or modified equipment using the existing transport corridors and its installation in the existing rooms without any need for enlargement of the rooms or transport corridors in the existing buildings, excepting basic civil work, consisting mainly of the modifications for the lift installation and modification or removal of some walls (not bearings) and ceilings between rooms.

The location for the installation of the new equipment is proposed in this Technical Specification, as specified in the Data Sheets. This area is prepared for work with contaminated materials. The rooms currently house various items of plant, pipe work, tanks and equipment. A few of these have significant internal contamination. The rooms selected for locating the new F&D equipment will be decontaminated and clean at the moment of providing and installing the new equipment.

Attachments of equipment to the floors shall be adequately performed, but not redundant, in order to permit the easy translation to another position under JAVYS authority.

For the installation of the decontamination baths, the devices shall be connected to the existing air exhausting system; with the tank for pre-treatment of spent solutions and to the special drainage system.

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The rinsing bath shall be interconnected with the tank for pre-treatment of spent solutions and connected to the special drain system.

The angular grinding devices shall be connected to a mobile exhaust unit equipped with a filter. All cutting (segmentation and fragmentation) devices shall be connected to existing air exhaust system through the filtering unit.

Construction works, attachment of devices, creation of separated workstation by portable walls are works necessities for the installation of the stationary hydraulic shears.

5.4 OPERATIONAL AND MAINTENANCE REQUIREMENTS

The equipment shall be operated in accordance with the existing /new operating manual updated/developed by the Contractor in accordance with the instructions of JAVYS Company. On the basis of the manual existing/new operation procedures for the plant personnel will be updated by the Employer under the supervision of the Contractor. Incorporation of the RAW minimization principle into the operating procedures (e.g. decontamination of the least active objects prior to more active ones using the same solutions)

The maintenance of the equipment shall be performed in accordance with the maintenance manual which shall be prepared and supplied by the Contractor. It will be subject to the Employer's approval. This manual shall include the scope, detailed programme, regulations and recommended time intervals for checks, adjustments and tests during and after outages.

The manual shall include all necessary drawings, lists, data sheets, bills of materials, etc. required for performing the tasks. The inspection procedures of the plant will be reviewed and updated by the Employer on the basis of the manual provided by the Contractor. The final version of all documents in the "as built" edition shall be sent to the Employer within two weeks after completion of the site acceptance tests.

Both operating and the maintenance procedures as well as the inspection procedures and other documents related to erection, installation, operation and maintenance shall include written precautions and limitations in cases, where these activities could cause severe injury or death of people or serious damage to the environment and equipment. These precautions and limitations shall warn the document users of actions that represent potential hazard to personnel, the environment and equipment.

The Contractor shall consider, in the design, the access required to perform maintenance inspection operations defined in the corresponding manuals.

The equipment shall provide the highest safety level for the personnel exposed to a radiation risk and to other harmful factors, related to operations with electricity, high pressure, temperature, strong acids, bases, oxidizing agents, etc.

The new F&D facilities operation shall respect the ALARA principles (operational and maintenance personnel doses shall be minimized).

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The main goal of the post-dismantling decontamination new facilities is to decrease surface contamination of materials to such level that allows the materials to be released into the environment under the legislation valid at the time of implementation or to the level for chosen disposal.

It is necessary to reach this goal together with the minimal production of secondary RAW per unit of cleared/liquidated RAW or material. In general, there should be no more than 3 – 5 % of secondary RAW generated per unit (metric ton) of liquidated material.

The produced RAW will consist of solid and liquid wastes to be generated following the implementation of the selected technologies (as specified in the section 5.15) and the functioning of the F&D equipment to be installed (as specified in the section 5.2). The produced RAW shall be solid and liquid low level radioactive waste that can be further treated, conditioned and loaded into disposal containers, by the dedicated facilities existing on site.

At the same time, it is necessary to minimize the costs for the conditioning of such RAW (work, energy, chemicals) and to optimize/minimize the occupational doses.

5.4.1 SPARE PARTS, CONSUMABLES AND CALIBRATION EQUIPMENT

The Contractor shall supply the items as specified below:

- All spare parts and consumables, needed during the installation period by the time of the completion of the commissioning tests of the new F&D facilities and issue of the operational license
- All spare parts recommended in the operation and maintenance technical manuals after approval by the Employer for routine, programmed maintenance and expected required operational replacements, to maintain stated processing availability for a period of three (3) years from commencement of operation. A list of the expected spare parts and consumables for a further seven (7) years of operation shall be provided complete with vendors identified from where the identified items can be obtained
- Any calibration sources and calibration equipment. Commonly used ionizing sources need not be provided. However the specifications of such sources shall be provided by the Contractor
- Two (2) sets of tools and equipment required for the assembly/disassembly of the equipment and its maintenance

5.5 RELIABILITY REQUIREMENTS

The Contractor shall ensure that, for the main F&D components, no life extension works induced by the degradation phenomena (erosion, corrosion, fatigue) are required during the period of twenty (20) years.

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The Contractor shall provide, in the equipment maintenance instructions, the criteria and the related values, which govern the decision on the replacement of the main internal parts of the equipment.

The Contractor shall establish the thickness of the F&D components to avoid erosion-corrosion phenomena reducing wall thickness below the minimum value.

The Contractor shall indicate the allowed maximum of erosion-corrosion; establish protection measures, special materials, etc. The Contractor shall also indicate specific inspection procedures to be used to monitor the degradation conditions and residual life of these components.

The Contractor shall provide a list of components and parts that require periodic maintenance during the specified design life. The Contractor shall indicate the period between individual maintenance operations and the number of these operations required during the lifetime of the equipment.

The Contractor shall indicate those components and parts to be replaced and the estimated number of hours required to perform the installation of the items. In addition, the Contractor shall indicate such maintenance or replacement operations that require the systems out of service. The maintenance period shall not influence the capacity of the equipment.

5.6 MATERIAL AND MANUFACTURING REQUIREMENTS

All permanent plant components and equipment supplied as part of the new F&D facilities shall be new, and in accordance with the design, drawings, and specifications provided by the Contractor and approved by the Employer. When it comes to the required materials equivalent or more suitable materials can be used.

All materials used in the construction of equipment shall be new and in accordance with applicable Slovak regulations and standards (see 5.8 and 7.1). The equipment and materials should also be compatible with the existing ones, unless upgraded equipment or materials are needed.

Equipment procured and/or fabricated by the Contractor shall be in accordance with this Specification, the approved design drawings, and the Slovak Standards. Fabrication practices shall be controlled so as to comply with requirements of the approved drawings and requirements governing this work. The time for performing the work shall comply with the schedule requirements agreed in the contract. This work shall be performed in compliance with the approved Quality Assurance Plan.

Equipment procured "off the shelf" shall be fully qualified and documented in a manner consistent with international standards.

Fabrication processes shall be to internationally recognised standards or shall be fully qualified and documented in a manner consistent with international standards. All welds shall meet the appropriate Slovak industrial standards, or the Contractor's alternative equivalent standard of choice.

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For equipment fabricated by the Contractor, component drawings that show fabrication by welding shall indicate the joints and the required weld joint geometry, welding procedure number, and the extent and type of inspection. Weld surfaces shall conform in all aspects to the requirements of the applicable welding code used by the Contractor.

For equipment fabricated by the Contractor, weld qualification and integrity shall be assured by employment of a fully documented welding programme, including non-destructive and destructive testing of representative mock-ups in accordance with the Contractor's chosen applicable welding codes.

The Contractor shall develop an End-of-Manufacturing Report, which shall include but shall not be limited to the following:

- End-of-Manufacturing Certificate,
- Quality Plan of the component at the final phase,
- The following documents referred to in the Quality Plan:
 - examination and test report,
 - development of welding protocol,
 - heat treatment diagram, and
 - non-conformance report (deviation report and mitigation mode),
- Welding protocols with relevant data,
- Filler materials qualification report, and
- Examination and testing procedures,
- Drawings

5.7 GENERAL AND SPECIFIC REQUIREMENTS FOR MARKING, PRESERVATION, PACKING, TRANSPORT AND DELIVERY TO THE SITE

The casing of the main technological components (valves, pumps, tanks, etc.) shall be marked with the following:

- Trade mark of the manufacturer;
- Serial number of the manufacturer;
- Year of manufacturing;
- Manufacturer's country;
- Relevant calculated parameters (pressure, temperature,...);
- Manufacturing type of the component; and
- Working medium.

The external surfaces of components made of carbon steel shall be painted and internal surfaces shall be properly protected.

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The preservation and packing of the equipment shall be suitable for multi-modal transportation (at temperatures from -30 C° to +40 C°) and storage over a period of 2 (two) years.

Other requirements for marking, packing and preservation shall be in compliance with EU practice.

The colour indication of the equipment (from working medium point of view) shall meet relevant Slovak standards.

The Contractor shall apply JAVYS tagging system. The tagging proposed by the Contractor shall be subject to the Employer's approval. The system shall identify individual items and complete systems. The identification code shall be engraved on stainless steel or laminated plastic tags permanently attached to the equipment component. This identification shall be maintained in all the documents (drawings, lists, manuals, data sheets, etc.) in which the equipment components are mentioned.

The above identification system shall be compatible with the existing equipment database ARSOZ of JAVYS (administrator database for maintenance and reparation). The Contractor shall provide all the information about the equipment, which is required for filling of the ARSOZ database. Details have to be agreed with the Employer.

5.8 LEGISLATIVE REQUIREMENTS

Within its scope of supply the Contractor shall elaborate the documentation in accordance with Act No. 50/1976 Coll. and Act No. 24/2006 Coll. and actively participate in the whole process in accordance with the specified acts until the issuance of the final statement (and the building permit and operational license respectively).

Within its scope of supply the Contractor shall elaborate the documentation related to the project according to Annex 1, parts B and C, of Act No. 541/2004 Coll., mainly the Safety report including proposals for operation limits and conditions, the List of classified and selected equipment including their categorization according to Regulation No. 50/2006 Coll. and No. 508/2009 Coll. and Quality plans in accordance with Regulation No 56/2006 Coll. and Act No. 541/2004 Coll.

In the design and implementation phase and during the commissioning, the requirements of the UJD SR Regulation No. 50/2006 Coll. [22], Appendix 3, Section B, I, Appendix 4, Section B, I and III and §2, 3, 4, 7, 8 and 12 of the UJD SR Regulation No. 53/2006 Coll., which lays down details on requirements for management of nuclear materials, radioactive waste and spent nuclear fuel, shall be met.

Equipment containing chemical substances and mixtures and the rooms where the equipment will be located shall meet the requirements of Act No. 364/2004 Coll. on Waters and on alternations of the Act of the Slovak National Council No. 372/1990 Coll. on Offences as amended (the water act) – e.g. leak tests of tanks and distribution pipes, collection baths under tanks etc.

5.8.1 LICENSING

For the purpose of obtaining the authorisations in accordance with Act No. 541/2004 Coll., the Contractor shall submit the Pre-Operational Safety Analysis Report and the List of Classified Equipment within its scope of supply, in accordance with Decree No. 56/2006 Coll. [12]. The

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Contractor shall also prepare Quality Plans for classified equipment, which shall be developed 2 months before the start of the implementation and duly applied after approval of the Employer (the Quality Plan should be developed and approved even before the Project Implementation Documentation is prepared, as it may occur that the UJD will not approve the proposed classified equipment).

If the building permit is necessary, the detailed design documentation should be elaborated by the Contractor in such a way that the documentation will be in accordance with Act No. 50/1976 Coll. [7] and its implementary regulation No. 453/2000 Coll. [28], particularly for the purposes of obtaining the building permit (Article 58 of Act No. 50/1976 Coll. [7]), as well as the documents for the issuance of the decision on accepting the change in the use of the building in accordance with Article 85 of Act No. 50/1976 Coll. [7]. For the purpose of the issuance of the house inspection certificate the Contractor shall develop the As Built Documentation in such a way that it meets the statutory requirements on the issuance of the house inspection certificate in accordance with Article 76 of Act No. 50/1976 Coll. [7].

Pursuant to Act 355/2007 Coll. on public health protection, support and development and on alterations of, and amendments to, some acts, as amended, §13 Section 5 Subsection a) Item 5, the project dealing with the supply of fragmentation and decontamination facilities has been defined as new technological procedures in the process of nuclear installation decommissioning.

The licensing documentation shall be developed before project implementation. This documentation shall be appended to the application for decision pursuant to Act 355/2007 Coll. on public health protection, support and development and on alterations of, and amendments to, some acts, §13 Section 5 Subsection a) Item 4 and 5 (list of documentation in accordance with Annex 2 Item IV and V of Act 355/2007 Coll.).

Before the commissioning, the documentation for obtaining the authorization to perform activities resulting in irradiation pursuant to Act 355/2007 Coll. on public health protection, support and development and on alterations of, and amendments to, some acts, §45 Section 2 Subsection a) and k) (a list of documentation in accordance with Annex 4 Item I A and XI of Act 355/2007 Coll. shall be developed.

As a matter of preference, the documentation developed according to Acts No. 541/2006 Coll. and No. 50/1976 Coll. shall be used to obtain the authorizations pursuant to Act No 355/2007 Coll.

The Contractor shall be responsible for development of the licensing documentation and the Contractor, in its turn, for filing the application with the competent state authorities.

5.9 RADIATION PROTECTION REQUIREMENTS ON THE PROJECT

5.9.1 OPTIMIZATION

ALARA (doses shall be as low as reasonably achievable) – optimization of radiation protection.

The requirement for optimization of the activity resulting in irradiation proceeds from Principle 2 of radiation protection and the requirements for optimization are defined in relevant Slovak laws (Act 355/2007 Coll. Annex 4, Ordinance of the Government of the Slovak Republic 345/2006 Coll. §8). Based on the aforementioned laws, the Contractor **shall be obliged to prove an optimum option of the facilities supplied and the activities**, in particular if alternative solutions are

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available. The optimization shall be based on anticipated individual and collective doses and on impacts of individual options on radwaste production and on release of radioactive substances to the environment.

In the stage of design development, the selected Contractor shall be obliged to proceed in accordance with Internal Regulation JAVYS/14/SM-RO-02 Application of ALARA Principle; adherence to the regulation shall **ensure optimization of the activities in the process of project implementation as well as after facility handover and operation under actual radiation situation in the V1 NPP** (development of „basic optimization“, comparison of calculated doses with tentative values, etc). In case of C7-A3 project, the optimization procedures are required to be developed, in accordance with the aforementioned internal regulation, for each processing facility separately.

It means that the position or shielding of the equipment shall be selected with the aim not to exceed the guide values of effective doses in working areas as well as restricted access areas.

5.9.2 RADIATION PROTECTION REQUIREMENTS ON THE DESIGN


- All workplaces, to which equipment will be supplied, shall be equipped in such a way to enable their delimitation and the establishing of a sanitary unit.
- Workplaces, where aerosol formation is expected, shall be equipped in such a way to limit the spread of contamination from the workplace and shall contain an exhaust system with efficient filtration resistant to the media used at the workplace.
- Aerosol volume activity shall be continuously measured downstream of the filtration to check the filtration efficiency. This measurement has to be compatible with equipment in the radiation control system.
- The exhaust system shall contain an own exhaust unit, the outlet of which may exit into the V1 NPP exhaust HVAC systems.

6. PROJECT IMPLEMENTATION

6.1 GENERAL ARRANGEMENTS

The Contractor shall provide effective management of the project, which shall, to the maximum extent reasonably possible, be based on a stable and dedicated project management team without responsibilities for other projects. This team shall be led by a project manager of adequate experience and status to provide effective management of the Contractor responsibilities. The Contractor shall provide and update details of his organization to the extent that it is involved in the management of this project. This information shall indicate the staff directly assigned to the project management and their respective relationships.

The Contractor shall be responsible for the scheduling, control and monitoring of all activities required to meet his responsibilities under the project and shall submit to the Employer schedules for reviewing project activities, as stated below.

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The Contractor shall organize the works in accordance with the JAVYS internal procedures and rules (mainly with ordinance SM-PR-04) and general Slovak standards concerning industrial safety.

6.2 OPERATING CONSTRAINTS

The Contractor shall take into consideration operating requirements of the Employer during the project implementation, referring to the Controlled Area of V1 NPP.

The Contractor shall perform the works so as to not fully interrupt the on-going site operations, and to limit their necessary shutdowns to a minimum or to perform the works during planned outages.

The works shall be performed in accordance with the time schedule elaborated by the Contractor and approved by the Employer.

6.3 INTERFACE MANAGEMENT

The Contractor shall be responsible for management of the project interfaces. In particular, the Contractor shall as a minimum:

- Identify all technical, operational and organizational interfaces necessary for successful project development
- Establish a proper interface scheme with clear definition of the interface purpose and responsibility for it

The interface manual shall be drafted by the Contractor. The interface manual shall be approved by the Employer. The Contractor shall be responsible for completion of this manual and its continuous update.

The completion and modifications of the interface manual shall be subject to the Employer's approval. The Employer is responsible for interactions with the external organizations (mainly NRA, UVZ, MZP SR). However, the Contractor shall support such interactions.

6.4 TIME SCHEDULE

The delivery, installation and testing of the equipment within this specification shall be completed no later than 36 months from the Contract signature. The equipment shall be delivered and installed in the JAVYS, Jaslovské Bohunice site.

The Contractor shall develop, submit to the Employer and keep updated in a consistent manner the following set of time schedules and programmes:

- Base Line Time Schedule
- Detailed Engineering and Procurement time schedule

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- Quality Programme for classified equipment
- Installation Area Preparation Programme
- Erection Programme
- Testing and Commissioning Programme

The Contractor shall provide, within his Tender Proposal, a draft of the base line time schedule. This schedule shall indicate the important milestones of the main project activities.

The Contractor shall submit the final version of the base line time schedule to the Employer within four weeks from the contract effective date. This schedule shall identify timing of works on all main components and subsystems and show the activities of engineering, subcontracting, detailed design, ordering of materials, manufacture, test, shipment and arrival on site, construction, erection, testing and commissioning so as to achieve the taking over of the works as well as all necessary administrative requirements.

The detailed engineering and procurement time schedule shall indicate the main engineering and procurement activities including interrelationships between construction activities, interfaces with detailed design engineering and procurement activities.


The Contractor shall submit the preparation, erection and testing and commissioning programmes. These programmes shall indicate the major preparation, erection, testing and commissioning logic and duration of individual activities, and shall be coordinated with the delivery dates of major components and systems.

All the above schedules and programmes shall include, as a minimum, the following information:


- description of project activities
- responsible person of the Contractor
- duration of the activities and
- planned date of the activity completion

The Contractor shall ensure that the above schedules and programmes are consistent.

6.4-1: PROJECT MILESTONES	
<i>Milestones</i>	<i>Assumed date of completion</i>
Development of Project documentation phase:	
1.1 Inception Report, Quality Assurance Plan, Time Schedule	CD + 1 month

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1.2 Preliminary Environmental Study in accordance with Article 22 of Act No. 24/2006 Coll. [8]	CD + 4 months
1.3 Detailed Design - Draft	CD + 5 months
1.4 Environmental Impact Assessment Report [8]	CD + 9 months
1.5 EIA - final statement [8]	CD + 14 months
1.6 Detailed Design – Final, including the Health & Safety Plan	CD + 16 months
1.7 Safety documentation in question according to Act No. 541/2004 Coll., Annex 1, (B), and that mainly: List of classified equipment according to Regulation No. 50/2006 Coll. Quality plan in accordance with Regulation No. 56/2006 Coll. and Act No. 541/2004 Coll. Modification of the Preoperational Safety Report including safety analyses and Limits and Conditions RAW management plan	CD + 16 months
1.8 Decision of the regulatory authority	CD + 22 months
Supply and installation:	
2.1 Elaboration and approval of the dismantling and installation programmes	CD + 23 months
2.2 Disconnection and dismantling of the existing equipment	CD + 24 months
2.3 Completion of civil works for equipment installation	CD + 24 months
2.4 Completion of auxiliary equipment installation	CD + 25 months
2.5 Installation of new systems	CD + 29 months
Tests, completion of works, training:	
3.1 Personnel training programmes	CD + 29 months
3.2 Development of the pre-commissioning and commissioning tests programmes	CD + 29 months
3.3 As-built documentation, Accompanying technical documentation in accordance with Regulation No. 50/2006 Coll. and Regulation No. 508/2009 Coll., elaboration of the operation procedure	CD + 29 months
3.4 Execution of the pre-commissioning and commissioning tests	CD + 30 months
3.5 Personnel training	CD + 30 months

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3.6 Request for approval on commissioning of the nuclear facility into operation (UJD+RÚVZ) – into trial operation	CD + 30 months
3.7 Issuance of the approval for trial operation	CD + 33 months
3.8 Complex tests (active) + trial operation	CD + 34 months
3.9 Evaluation of the Complex tests and of the trial operation	CD + 35 months
3.10 Issuance of the Taking-Over Certificate	CD + 35 months
3.11 Using permit procedure ("kolaudačné konanie")	CD + 35 months
3.12 Acceptance of the Final Report	CD + 36 months

6.5 REPORTING

The Employer will monitor the project execution, manufacturing, shipping, testing and decommissioning on the basis of the monthly progress meetings and reports and site inspections, including up-dated time schedules and a list of open items; the reports shall be prepared and submitted by the Contractor as hard copy, as well as in electronic format (see Table 6.5-1). The details will be agreed upon during the kick-off meeting.

In case, that a special problems arise, the Employer may convene project meetings; the Contractor shall participate in such meetings in order to report on the problems encountered and agree on the solutions to be adopted.

6.5-1: List of delivered technical documents and reports to be reviewed by Employer		
Name	Submission Date	Language / Copies in hard copy
Inception Report	CD + 1 month	Slovak / 6 English / 3
Detailed time schedule of engineering and procurement	CD + 1 month	Slovak / 6 English / 3
Preliminary Environmental Study in accordance with Article 22 of Act No. 24/2006 Coll. [8]	CD + 4 months	Slovak / 6 English / 3 German / 3
Environmental Impact Assessment Report [8]	CD + 9 months	Slovak / 6 English / 3 German / 3

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6.5-1: List of delivered technical documents and reports to be reviewed by Employer		
Name	Submission Date	Language / Copies in hard copy
Quality Assurance Plan, Health and safety plan [25]	CD + 16 months	Slovak / 6 English / 3
Detailed design Final	CD + 16 months	Slovak / 6 English / 3
Safety documentation (Annex 1, part B of Act No. 541/2004 Coll.)	CD + 16 months	Slovak / 6 English / 3
Erection programme	CD + 23 months	Slovak / 6 English / 3
Rooms preparation programme, Dismantling programme	CD + 23 months	Slovak / 6 English / 3
Installation programme	CD + 23 months	Slovak / 6 English / 3
Personnel training programmes	CD + 29 months	Slovak / 6 English / 3
Operating procedures	CD + 29 months	Slovak / 6 English / 3
Tests and commissioning programmes	CD + 29 months	Slovak / 6 English / 3
Accompanying technical documentation	CD + 29 months	Slovak / 6 English / 3
As-built documentation	CD + 29 months	Slovak / 6 English / 3
Risk assessment and operating instructions for the protection of personnel against the risks related to noise exposure (Article 3 of Governmental Decree No. 115/2006 Coll. [31])	CD + 31 months	Slovak / 6 English / 3



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6.5-1: List of delivered technical documents and reports to be reviewed by Employer

Name	Submission Date	Language / Copies in hard copy
Risk assessment and operating instructions for the protection of personnel against the risks related to the exposure to chemical agents (Article 4 of Governmental Decree No. 355/2006 Coll. [30])	CD + 31 months	Slovak / 6 English / 3
Final protocol of pre-commissioning and commissioning tests	CD + 35 months	Slovak / 6 English / 3
Safety documentation (Annex 1, part C of Act No. 541/2004 Coll.)	CD + 30 months	Slovak / 6 English / 3
Monthly progress reports	Monthly	Slovak / 6 English / 3
Specific Reports (completion of fragmentation line, decontamination line)	CD + 30 months	Slovak / 6 English / 3
Final Report	CD + 36 months	Slovak / 3 English / 3

*Note: **CD** - Contract Commencement Date, **M** - Monthly submission*

The documents above shall be submitted not only in written, but also in electronic form in both language versions on a durable medium (CD/DVD).

The Design documentation shall be of the grade „Detail Design Documentation“ developed in appropriate extent in accordance with Appendix No. 4 of rate book UNIKA [21].

6.6 SHIPPING AND STORAGE REQUIREMENTS

The Contractor shall be responsible for shipping of the equipment to the JAVYS site. All costs related to the shipping shall be at the Contractor's expenses. The delivered equipment will be stored on the place specified by the Employer.

6.7 EMPLOYER'S PERSONNEL TRAINING

The Contractor shall provide, to the Employer's personnel, the training required for testing, commissioning, operating and maintaining the mechanical, electrical and I&C parts of the equipment.

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The Contractor shall prepare a detailed training schedule including the scope of the training and the trainers' manpower assigned; the training schedule and the scope of the training materials shall be approved by the Employer.

The training shall be carried out in the Slovak language in the Employer's premises. It shall involve a minimum of 40 trainees from different plant departments. The training cycle for each group shall cover one week.

All costs related to the personnel training, such as teaching materials, travel and accommodation of trainers, translator, interpreter and miscellaneous expenses shall be at the Contractor's expenses.

6.8 QUALITY ASSURANCE

The purpose of this section is to define the requirements for the Contractor's Quality Assurance Plan, as well to establish the responsibilities, interfaces and other aspects related to the execution of the works in all phases of the project.

Quality Assurance Plan

Within 1 month after contract award and in any case before the actual start of the contractual activities, the Contractor shall develop and submit to the Employer for approval a **Quality Assurance Plan (QAP)** which determines the policies, procedures and instructions for implementing the works within the project.

The **QAP** shall provide a detailed description of the following chapters:

- Introduction: to describe the purpose, aim and content of the Quality Assurance Plan;
- Scope of the project: to describe the scope of the BIDSF project and if the subject-matter of the contract is the procurement of works and goods, it is also necessary to describe the impact of the project on nuclear safety, radiation protection, the environment, safety at work, fire protection, metrology, specific requirements on the equipment, etc.;
- Responsibilities and competences: to describe the responsibilities and competences of the individual members in the project from the side of the Contractor including the organization structure and communication channels between individual members of the Contractor and Employer, the persons responsible for the individual deliverables including their contact information (telephone numbers, e-mail addresses);
- Requirements on the quality system of the Contractor:
 - i. general requirements – in compliance with ISO 9001:2008, if appropriate ISO 14001:2004 and OHSAS 18001:2007 if the Contractor has these systems implemented and certified (copies of certificates are to be included in the appendix)
 - ii. documentation requirements
 - iii. quality manual
 - iv. management of documents
 - v. management of records
- Other chapters in compliance with ISO 9001:2008 depending on the character of the BIDSF project: to define briefly how the resource management is managed within the project, the realization of the product, design and development (if applicable) purchasing, production

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and provision of services, control of monitoring and measuring devices, measuring, analysis and improvement (customer satisfaction, internal audit, monitoring and measuring of processes and the product), management of nonconforming product, analysis of data, improvement (continual improvement, corrective and preventive actions)

- Source documentation
- Reference documentation
- Appendices

Detailed requirements on the content of the project Quality Assurance Plan will be defined and provided to the Contractor during the project Kick-off meeting.

Any change affecting the documents comprised in the **Quality Assurance Plan** shall be submitted to the Employer for approval.

The Contractor shall ensure that each subcontractor either keeps and adequate in-house QAP or conforms to the applicable section of the Contractor's Quality Assurance Plan. The Contractor shall identify all the applicable QA requirements in the purchasing documents to its sub-contractors so as to assure compliance with the Contractor's Quality Assurance commitments. This shall include audits which the Employer will have a right to attend.

7. CODES, STANDARDS AND CERTIFICATION

7.1 CODES AND STANDARDS

- For the purpose of the Contract, relevant Slovak Technical Standards (STN) shall be applied.
- Upon agreement with the Employer, international standards/directives and recommended approaches, or other equivalent standards and regulations are allowed if their requirements are equal to, or stricter than those set forth in Item 1 of this Section; should the case arise, the Contractor shall provide to the Employer a proof of equivalence. The expenses for such demonstration of equivalence shall be borne by the Contractor.
- The Contractor shall draw the Employer's attention to any conflicts between the requirements of this Specification and the documents listed in this section. Should there be any difference of opinion with regard to interpretation of requirements, the Employer interpretation shall rule.
- The design, manufacturing, inspection and testing of the equipment and its components shall be carried out in accordance with the requirements and criteria specified in the Slovak legislative documents, standards and codes. It is permitted, for new installed equipment of foreign (EC) origin, to adopt those codes and standards which are valid in the country where the components are manufactured. Equipment shall be coded by the following certification symbol:



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7.2 CERTIFICATION

- In accordance with Slovak legislation, any nuclear equipment to be supplied to JAVYS shall be certified. The certification is performed by a relevant state Authority. The compliance of the characteristics of the equipment to be supplied with the specific requirements of the Slovak Republic will be checked at the stage of certification.
- The certification is performed in accordance with Act No. 142/2000 Coll. on Metrology.
- The duration of the certification process depends on the scope of the supply. The certification Authority may require the performance of additional tests to confirm the characteristics of the equipment to be supplied.
- The Contractor shall bear all expenses related to the certification. The cost of certification depends on the selected scheme of certification and the scope and completeness of the documents submitted by the Contractor.

8. TESTING AND ACCEPTANCE

8.1 GENERAL REQUIREMENTS FOR TESTING

The Contractor shall perform necessary testing to demonstrate the compliance of the supply with this technical specification and the requirements of applicable standards. The process shall include:

- inspections and testing during manufacturing
- inspection and testing after manufacturing (pressure, leak and components tests, etc.)
- verification before release for transportation
- site acceptance tests

The results of the inspections and testing during and after manufacturing shall be included in the End-of-Manufacturing Report.

The verification before release for transportation, carried out by the Contractor, shall include a completeness check of the equipment and documentation, examination of project documents (design and manufacture documents), checking of report on non-conformances and repairs carried out.

The site acceptance tests and the acceptance procedure shall comply with the contract requirements.

The Contractor shall provide non-permanent instruments or equipment required for performing the tests. These instruments shall be removed after the site acceptance tests. If the test performance

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requires specific testing software or computer applications, they shall be provided by the Contractor. All testing equipment shall be qualified and calibrated in accordance with the applicable standard.

The documentation for the performance of the tests and the performance of the tests shall be in accordance with valid JAVYS directives.

The following types of site acceptance tests (including takeover certificate) are required:

- erection acceptance tests
- pre-commissioning tests
- Inactive and active commissioning tests, and
- trial operation

8.2 ERECTION ACCEPTANCE TESTS

The erection acceptance test verifies whether the used materials as well as overall execution of the installation, maintenance or reconstruction of the facility meet standards, design and further documentation. Successful passing of this test is a necessary condition for starting of the following tests.

8.3 PRE-COMMISSIONING AND INACTIVE COMMISSIONING TESTS

The purpose of the pre-commissioning tests is to confirm that individual system components have been manufactured in compliance with requirements stated in the Quality Plan of the classified equipment and they are approved by corresponding Decision of UJD SR. That is why these tests are to be conducted after the components are manufactured or installed.

The purpose of the commissioning tests is to prove that the individual system (subsystem) is able to meet required functions in accordance with this Technical Specification. They shall include also the specified operational tests to demonstrate that the systems (subsystems) and the whole plant can be operated safely and as specified, under all available operating conditions (integrity and functionality tests).

The Contractor shall develop the programme for the pre-commissioning and commissioning tests. The programme shall be approved by the Employer and UJD SR. The Contractor shall be responsible for performing the pre-commissioning and commissioning tests on the JAVYS site.

Prior to the performance of these tests, the Contractor shall make available the technical documentation and the records of any relevant tests carried out during the manufacture of the equipment.

A test report shall be prepared by the Contractor and approved by the Employer. Based on the results of these tests, the Employer will make a decision (issuance of protocol) on whether the component performance has met the required objectives.

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All costs related to the pre-commissioning and inactive commissioning tests shall be at the Contractor's expense. This shall also cover the miscellaneous expenses of the Contractor's experts, such as travel, accommodation and daily allowances. The Contractor shall provide the service of an interpreter.

The Contractor shall also fund necessary improvements of the equipment resulting from the tests as well as possible retesting.

Successful termination of the pre-commissioning and inactive commissioning tests is a necessary condition for starting of commissioning tests.

8.4 ACTIVE COMMISSIONING TESTS

The purpose of the active commissioning tests is to prove that the individual system (subsystem) is able to meet required functions in accordance with this Technical Specification. They shall include also the specified operational tests to demonstrate that the systems (subsystems) and the F&D facilities can be operated safely and as specified, under all available operating conditions (integrity and functionality tests).

The Contractor shall develop the programme for the commissioning tests. The programme shall be approved by the Employer and UJD SR. The Contractor shall perform the commissioning tests on the JAVYS site in Bohunice.

A test report shall be developed by the Contractor and approved by the Employer. Based on the results of these tests, the Employer will make a decision (issuance of protocol) on whether the system (subsystem) performance has met the required objectives.

All costs related to the active commissioning tests shall be at the Contractor's expenses. This shall also cover the miscellaneous expenses of the Contractor's experts such as travel, accommodation and daily allowances. The Contractor shall provide the service of an interpreter.

Necessary improvements of the equipment resulting from this test as well as possible retesting shall be at the expenses of the Contractor.

After implementation of pre-commissioning and commissioning tests, the Contractor shall update the documentation and approve it in terms of as-built documentation.

Successful termination of the commissioning tests is a necessary condition for starting of trial operation.

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8.5 TRIAL OPERATION (TRIAL RUN)

The purpose of the trial operation (commissioning) is to confirm that the operation and the interfacing of the new equipment are in accordance with the operational requirements of the Employer. The trial operation will have to demonstrate that the equipment performs reliably and in accordance with the Contract.

The Contractor shall develop commissioning programme subject to the approval of the Employer and UJD SR.

The duration of the trial operation (trial run) shall be at least one (1) week. The equipment shall demonstrate the capability of a full power operation at the guaranteed efficiency and design parameters during this period.

The environmental criteria test shall be carried out during the trial operation of the F&D facilities. The purpose of the environmental criteria test is to confirm that the operation of the modified equipment is able to meet all the Slovak and international environmental standards.

The Employer shall execute the trial operation under the permanent supervision of the Contractor's expert.

A test report shall be prepared by the Contractor and approved by the Employer.

All costs related to the mission of the Contractor's experts to the site, such as travel, accommodation and miscellaneous expenses, shall be at the Contractor's expense. The Contractor shall provide the interpreter services.

9. MAINTENANCE SUPPORT AND AFTER SALES SERVICES

The Contractor shall provide in its maintenance instructions the criteria and the related values, which govern the decision on the replacement of the main internal parts of the equipment.

The Contractor shall provide a list of new components and parts that require periodic maintenance or replacement during the specified design life. The Contractor shall indicate the period between individual maintenance operations and the number of these operations required during the lifetime of the equipment.

The Contractor shall identify and indicate those components and parts to be replaced and the estimated number of hours required to perform the installation of the items (see section 5.4.1 for spare parts during the guarantee period).

In addition, the Contractor shall indicate those maintenance or replacement operations that require the F&D facilities to be out of service. The Contractor shall state the out of service time required.

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The Contractor shall indicate in the bid the process of his maintenance support and after sales services.

10. WARRANTY

The Contractor shall ensure that, for the delivered components, no life extension works induced by the degradation phenomena (erosion, corrosion, fatigue) shall be required during the 2 years warranty period.

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11. REFERENCES

- [1] The EIA Report of V1 NPP Decommissioning
- [2] Act No. 541/2004 Coll. on Peaceful Use of Nuclear Energy (Atomic Act), as amended
- [3] Act No. 355/2007 Coll. on Public Health Protection, as amended
- [4] Slovak Government Ordinance No. 345/2006 Coll. on basic safety requirements for health protection of the workers and general public against the ionizing radiation
- [5] Regulation No 545/2007 Coll. which lays down details about requirements for radiation protection assurance in the activities leading to the radiation and activities important from the radiation protection point of view
- [6] Act No. 124/2006 Coll. – on Occupational Safety and Health, as amended
- [7] Act No. 50/1976 Coll. on Land-use Planning and Building Order (the Building Act), as amended
- [8] Act No. 24/2006 Coll. on Environmental Impact Assessment, as amended
- [9] Act No. 142/2000 Coll. on Metrology, as amended
- [10] Regulation No. 59/1982 Coll. specifying Basic Requirements for Labour Safety and Safety of Technical Installations, as amended
- [11] Regulation of the Slovak Office for Safety at Work No. 374/1990 Coll. on Safety at Work and Technical Equipment during Construction Activities
- [12] UJD SR Regulation No. 56/2006 Coll. on details concerning requirements for quality system documentation of the authorization holder, as well as details concerning quality requirements for nuclear installations, details concerning quality requirements for classified equipment and details concerning the scope of their approval
- [13] STN EN ISO 9001 - Quality management system. Requirements
- [14] STN EN ISO 12100-2 – Safety of machinery. Part 2: Technical principles
- [15] ISO 7919 / 10816, Mechanical vibration on non-reciprocating machines. Measurements on rotating shafts and evaluation criteria

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- [16] SM-PR-04 JAVYS Internal Procedure
- [17] API 670, Machinery protection systems
- [18] NEMA MG-1, Motors & Generators
- [19] Decontamination Techniques Used in Decommissioning Activities - A Report by the NEA Task Group on Decontamination
- [20] IAEA TRS 395 - State-of-the-Art Technology for Decontamination and Dismantling of Nuclear Facilities
- [21] Rate book for quoting proposal prices of design works and engineering activities, UNIKA 2010
- [22] UJD SR Regulation No. 50/2006 Coll. on details concerning the nuclear safety requirements for nuclear installations in respect of their siting, design, construction, commissioning, operation, decommissioning and closure of repository, as well as criteria for categorization of classified equipment into safety classes
- [23] Ministry of Labour, Social Affairs and Family of the Slovak Republic Regulation No. 508/2009 Coll., which lays down details on ensuring industrial safety during work with pressure equipment, lifting equipment, electric and gas equipment and which determines technical equipment regarded as classified technical equipment, as amended
- [24] Act No. 287/2009 Coll. amending and supplementing Act No. 24/2006 Coll. on the assessing of environmental influences and on amending and supplementing certain Acts, as amended
- [25] Governmental decree No. 396/2006 Coll. on Minimal Safety and Health Requirements for Workplace
- [26] Governmental Ordinance No. 392/2006 Coll. on the minimum safety and health requirements for using working means
- [27] MZP SR Statement No. 5235/2010-3.4/hp in accordance with Act No. 24/2006 Coll. concerning the „Erection of the new large capacity F&D facility V1 NPP“ (BIDSF project C7-A3)
- [28] MZP SR Regulation No. 453/2000 Coll. implementing certain provisions of the building act

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- [29] Act No. 138/1992 Coll. on authorised architects and authorised civil engineers, as amended
- [30] Governmental Decree No. 355/2006 Coll. on the protection of employees against the risks related to exposure to chemical agents at work, as amended
- [31] Governmental Decree No. 115/2006 Coll. on minimal health and safety requirements on the protection of workers against the risks related to noise exposure, as amended
- [32] Directive JAVYS/14/SM-SM-11 "Marking principles, design and location of labels of V1 NPP technological equipment"