



NEC3 Engineering & Construction Contract

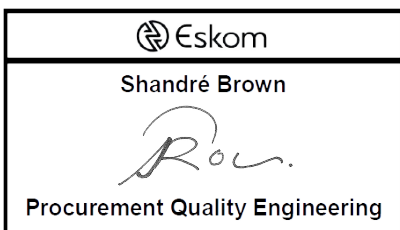
Between **ESKOM HOLDINGS SOC Ltd**
(Reg No. 2002/015527/30)

and [Insert at award stage]
(Reg No. _____)

for **The Replacement of the Seismic Monitoring and Instrumentation System at Koeberg Nuclear Power Station Unit 1**

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CONTRACT No. [Insert at award stage]



2024-04-03
Q3/L2 Service

Part C1: Agreements & Contract Data

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C1.1 Form of Offer & Acceptance

Offer

The *Employer*, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of:

The Replacement of the Seismic Monitoring and Instrumentation System at Koeberg Nuclear Power Station Unit 1

The tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and addenda thereto and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance the tenderer offers to perform all of the obligations and liabilities of the *Contractor* under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the *conditions of contract* identified in the Contract Data.

Options A	The offered total of the Prices exclusive of VAT is	
	Sub total	
	Value Added Tax @ 15% is	
	The offered total of the amount due inclusive of VAT is ¹	
	(in words)	

This Offer may be accepted by the *Employer* by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the *Contractor* in the *conditions of contract* identified in the Contract Data.

Signature(s)

Name(s)

Capacity

For the tenderer:

.....
(Insert name and address of organisation)

Name & signature of witness

Date

Tenderer's CIDB registration number (if applicable)

¹ This total is required by the *Employer* for budgeting purposes only. Actual amounts due will be assessed in terms of the *conditions of contract*.

Acceptance

By signing this part of this Form of Offer and Acceptance, the *Employer* identified below accepts the tenderer’s Offer. In consideration thereof, the *Employer* shall pay the *Contractor* the amount due in accordance with the *conditions of contract* identified in the Contract Data. Acceptance of the tenderer’s Offer shall form an agreement between the *Employer* and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

- Part C1 Agreements and Contract Data, (which includes this Form of Offer and Acceptance)
- Part C2 Pricing Data
- Part C3 Scope of Work: Works Information
- Part C4 Site Information

and drawings and documents (or parts thereof), which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Returnable Schedules as well as any changes to the terms of the Offer agreed by the tenderer and the *Employer* during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The tenderer shall within two weeks of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), contact the *Employer’s* agent (whose details are given in the Contract Data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the *conditions of contract* identified in the Contract Data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy signed between them of this document, including the Schedule of Deviations (if any).

Unless the tenderer (now *Contractor*) within five working days of the date of such receipt notifies the *Employer* in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the Parties.

Signature(s)

Name(s) _____

Capacity _____

**for the
*Employer***

Eskom Holding SOC Limited, Koeberg Nuclear Power Station
R27 off West Coast Road, Melkbosstrand, Cape Town, 7441

Name &
signature of
witness

Date

Note: If a tenderer wishes to submit alternative tenders, use another copy of this Form of Offer and Acceptance.

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Schedule of Deviations to be completed by the *Employer* prior to contract award

Note:

1. This part of the Offer & Acceptance would not be required if the contract has been developed by negotiation between the Parties and is not the result of a process of competitive tendering.
2. The extent of deviations from the tender documents issued by the *Employer* prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
3. A tenderer's covering letter must not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid be the subject of agreement reached during the process of Offer and Acceptance, the outcome of such agreement shall be recorded here, and the final draft of the contract documents shall be revised to incorporate the effect of it.

No.	Subject	Details
1	[•]	[•]
2	[•]	[•]
3	[•]	[•]
4	[•]	[•]
5	[•]	[•]
6	[•]	[•]
7	[•]	[•]

By the duly authorised representatives signing this Schedule of Deviations below, the *Employer* and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any confirmation, clarification, or changes to the terms of the Offer agreed by the tenderer and the *Employer* during this process of Offer and Acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Form shall have any meaning or effect in the contract between the parties arising from this Agreement.

For the tenderer:

For the *Employer*

Signature _____

Name _____

Capacity _____

On behalf of *(Insert name and address of organisation)* _____

Eskom Holding SOC Limited, Koeberg Nuclear Power Station

R27 off West Coast Road, Melkbosstrand, Cape Town, 7441

Name & signature of witness _____

Date _____

C1.2 ECC3 Contract Data

Part one - Data provided by the *Employer*.

Clause	Statement	Data
1	General	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	A: Priced contract with activity schedule
	dispute resolution Option	W1: Dispute resolution procedure
	and secondary Options	X1: Price adjustment for inflation
		X2 Changes in the law
		X3: Multiple currencies
		X5: Sectional Completion
		X7: Delay damages
		X13: Performance Bond
		X14: Advance Payment
		X16: Retention
		X18: Limitation of liability
		Z: Additional conditions of contract
	of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)	
10.1	The <i>Employer</i> is	Eskom Holdings SOC Ltd (reg no: 2002/015527/30), a state-owned company incorporated in terms of the company laws of the Republic of South Africa
	Address	Registered office at Megawatt Park, Maxwell Drive, Sandton, Johannesburg
	Represented by:	Mr Danie Möller
	Tel No.	+27 21 522 1747
10.1	The <i>Project Manager</i> is:	John Gildenhuis
	Address	Eskom Holdings SOC Limited, Koeberg Nuclear Power Station R27 off West Coast Road, Melkbosstrand, Cape Town, 7441

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	Office No.	+27 21 550 4998
10.1	The <i>Supervisor</i> is:	Aretha Galetta
	Address	Koeberg Nuclear Power Station R27 Trunk Road, Kernkrag Melkbosstrand 7441
	Office No.	+27 21 550 5425
11.2(13)	The <i>works</i> are	The Replacement of the Seismic Monitoring and Instrumentation System at Koeberg Nuclear Power Station Unit 1
11.2(14)	The following matters will be included in the Risk Register	<ul style="list-style-type: none"> • Issues that emerge from the risk reduction meetings • Items notified as early warnings
11.2(15)	The <i>boundaries of the site</i> are	The areas associated with the <i>works</i>, within the boundaries of Access Control Point 2 (ACP 2) at Koeberg Operating Unit.
11.2(16)	The Site Information is in	Part 4: Site Information
11.2(19)	The Works Information is in	Part 3: Scope of Work and all documents and drawings to which it makes reference.
12.2	The <i>law of the contract</i> is the law of	the Republic of South Africa
13.1	The <i>language of this contract</i> is	English
13.3	The <i>periods for reply</i> are	<ul style="list-style-type: none"> • 2 (two) weeks during non-outage periods. • 24 (twenty-four) hours during outage. • Periods for review as stated in the Works Information.
2	The Contractor's main responsibilities	Data required by this section of the core clauses is provided by the <i>Contractor</i> in Part 2 and terms in italics used in this section are identified elsewhere in this Contract Data.
3	Time	
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	TBA

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11.2(9)	The <i>key dates</i> and the <i>conditions</i> to be met are:	Condition to be met		key date
		1	Submission of an acceptable scheme design.	In terms of first accepted programme
		2	Submission of an acceptable installation detailed design with safety case and detailed design document according to 331-86.	In terms of first accepted programme
		3	Submission of an acceptable work plan (KFA-002) and all other applicable documents	In terms of first accepted programme
		4	Delivery of all plant material including qualification documentation to Koeberg Nuclear Power Station, Receipt inspection after delivery.	In terms of first accepted programme
		5	Implementation, testing, commissioning, and training of the modified system	Unit 1: Unit outage 127
		6	Disposal of removed material.	In terms of first accepted programme
30.1	The <i>access dates</i> are:	Part of the Site		Date
		1	Koeberg Operating Unit	The starting date
		2	The Site area associated with the works	In terms of the Accepted Programme
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	Four (4) weeks of the Contract Date.		
31.2	The <i>starting date</i> is	One (1) week after contract placement		
32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	Four (4) weeks, but before the end of the assessment interval.		
35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date.			

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4	Testing and Defects		
42.2	The <i>defects date</i> is	<p>The <i>defects date</i> is on completion of <i>works</i> for period of twelve (12) months.</p> <p>The <i>works</i> or particular parts thereof which are repaired or replaced shall be re-warranted against Defects for a further twelve (12) months from the date such repaired works or replaced parts are installed.</p>	
43.2	The <i>defect correction period</i> is	two (2) weeks of date of notification.	
	except that the <i>defect correction period</i> for	the period during the installation outage after Completion of the particular section of the <i>works</i> , where the <i>Contractor</i> is still on Site is two (2) days	
5	Payment		
50.1	The <i>assessment interval</i> is	Monthly, between the 24th and 25th day of each successive month.	
50.2	The expenses stated by the <i>Employer</i> for Compensation Events are	Item	Amount
		Accommodation	Domestic hotel accommodation may not exceed R1 400 (one thousand four hundred rand) inclusive of VAT, per night per person (including dinner, breakfast, and parking).
		Flights	<p>at cost with the following stipulations:</p> <ul style="list-style-type: none"> • Local flights –travel on economy class • International flights –travel on economy class <p>No business or first-class travel is allowed</p>

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		Car Hire	<p>at cost with the following stipulations:</p> <p>Group B or an equivalent class.</p> <p>Group B vehicles contain the following specifications:</p> <ul style="list-style-type: none"> • 5 Doors, Manual • Air Conditioning • Radio/CD • Power Steering • Airbags, Central Locking • ABS
		Airport parking charges, toll fees and taxis	at cost
		<p>The above is in terms of:</p> <ul style="list-style-type: none"> • Government Gazette No.37042 dated 15 November 2013, • Treasury Regulations (published under Government Notice R225 of 15 March 2005, as amended) • Eskom's Directive for the Implementation of the National Treasury Cost Containment Instruction and Government Gazette (Ref: 240-78635659). 	
		<ul style="list-style-type: none"> • All expenses claimed by the <i>Contractor</i> must be supported by a corresponding documentation (for example: receipt / invoice / statement). • No fee percentage may be added to accommodation and travel costs. 	
51.1	The <i>currency of this contract</i> is the	South African Rand (ZAR)	
51.2	The period within which payments are made is	8 weeks after receipt of a valid tax invoice.	
51.4	The <i>interest rate</i> is	the publicly quoted prime rate of interest (calculated on a 365-day year) charged from time to time by the Standard Bank of South Africa Limited (as certified, in the event of any dispute, by any manager of such bank, whose	

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		<p>appointment it shall not be necessary to prove) for amounts due in Rands and</p> <p>(ii) the LIBOR rate applicable at the time for amounts due in other currencies. LIBOR is the 6 month London Interbank Offered Rate quoted under the caption “Money Rates” in The Wall Street Journal for the applicable currency or if no rate is quoted for the currency in question then the rate for United States Dollars, and if no such rate appears in The Wall Street Journal then the rate as quoted by the Reuters Monitor Money Rates Service (or such service as may replace the Reuters Monitor Money Rates Service) on the due date for the payment in question, adjusted <i>mutatis mutandis</i> every 6 months thereafter and as certified, in the event of any dispute, by any manager employed in the foreign exchange department of The Standard Bank of South Africa Limited, whose appointment it shall not be necessary to prove.</p>
6	Compensation events	
60.1(13)	The place where weather is to be recorded is:	Koeberg Operating Unit Meteorological Station.
	The <i>weather measurements</i> to be recorded for each calendar month are,	<ul style="list-style-type: none"> • the cumulative rainfall (mm) • the number of days with rainfall more than 10 mm • the number of days with minimum air temperature less than 0 degrees Celsius
	The <i>weather measurements</i> are supplied by	<ul style="list-style-type: none"> • Koeberg Operating Unit Meteorological Station. • Wind data to be measured by the crane anemometer and record thereof confirmed by the Supervisor
	The <i>weather data</i> are the records of past <i>weather measurements</i> for each calendar month which were recorded at:	Koeberg Operating Unit Meteorological Station.
	and which are available from:	the South African Weather Bureau and included in Annexure A to this Contract Data provided by the <i>Employer</i>
60.1(13)	Assumed values for the ten (10) year return <i>weather data</i> for each <i>weather measurement</i> for each calendar month are:	As stated in Annexure A to this Contract Data provided by the <i>Employer</i>.
7	Title	There is no reference to Contract Data in this section of the core clauses and terms in italics

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		used in this section are identified elsewhere in this Contract Data.
8	Risks and insurance	Refer to Z13
80.1	These are additional <i>Employer's</i> risks	None
9	Termination	There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.
10	Data for main Option clause	
A	Priced contract with activity schedule	There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.
11	Data for Option W1	
W1.1	The <i>Adjudicator</i> is	The referring Party selects 2 (two) persons from the panel of NEC Adjudicators set up by the ICE-SA Division (or its successor body) of the South African Institution (see www.ice-sa.org.za) and whose availability he has confirmed to act as the Adjudicator. The other Party selects 1 (one) of the 2 (two) nominees to be the Adjudicator within 4 (four) days, failing which the person chosen by the first party will be the Adjudicator. The parties appoint the selected Adjudicator under the NEC3 Adjudicator's Contract. If the Parties do not agree on an Adjudicator, the Adjudicator will be appointed by the Adjudicator nominating body.
W1.2(3)	The <i>Adjudicator nominating body</i> is:	the Chairman of ICE-SA a joint Division of the South African Institution of Civil Engineering and the London Institution of Civil Engineers. (See www.ice-sa.org.za) or its successor body.
W1.4(2)	The <i>tribunal</i> is:	Arbitration.
W1.4(5)	The <i>arbitration procedure</i> is	the latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators (Southern Africa) or its successor body.
	The place where arbitration is to be held is	Cape Town, South Africa
	The person or organisation who will choose an arbitrator: - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is	the Chairman for the time being or his nominee of the Association of Arbitrators (Southern Africa) or its successor body.

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12	Data for secondary Option clauses			
X1	Price adjustment for inflation	Price adjustment will only be applicable after the first 12 months of the Contract Date		
X1.1(a)	The <i>base date</i> for indices is	One month prior to the tender closing date		
X1.1(c)	The proportions used to calculate the Price Adjustment Factor are:	proportion	linked to index for	Index prepared by
		Project Management and Fixed Cost		
		0.25	People	“Consumer Price Index and percentage change according to area” for the Witwatersrand as published in the Statistical News Release, P0141 Table 7.1 of Statistics South Africa
		0.05	Equipment	“Producer Price Index for selected materials” for construction machinery (excluding trucks) as published in the Statistical News Release P0142.1, Table 12 of Statistics South Africa
		0.45	Plant and Material	“Producer Price Index for materials used in certain industries” for Building and Construction: Building industries as published in the Statistical News Release P0142.1, Table

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				11 of Statistics South Africa
		0.10	Fuel (Diesel)	“Producer Price Index for selected materials” for diesel at wholesale level: Witwatersrand as published in the Statistical News Release P0142.1, Table 12 of Statistics South Africa
		0.15	non-adjustable	
	Total	1.00	The Price Adjustment Factor is not applied to the special materials identified by the Contractor in Part 2 of the Contract Data which are increased or decreased by the net amount of any documented variation incurred after the base date on the basis set out in such data.	
X1.4	Price adjustment	Price adjustment for inflation is not applicable to a change in the Price for Work Done to Date since the last assessment, for a change in the Price for Work Done to Date since the last assessment after the Completion Date for which delay damages in terms of Option X7 are applicable.		
X2	Changes in the law	There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.		

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X3	Multiple currencies			
X3.1	The <i>Employer</i> will pay for these items or activities in the currencies stated	Items & activities	Other currency	Maximum payment in other currency
		[•]	[•]	[•]
		[•]	[•]	[•]
		[•]	[•]	[•]
		[•]	[•]	[•]
X3.1	The <i>exchange rates</i> are those published in	[•] on [•] (date)		
		<p>The items & activities will be paid in the other currency.</p> <p>- to a foreign Bank account nominated by the <i>Contractor</i></p> <p>The direct cost of modification of forward cover due to a change in the following is paid by the Party causing the change:</p> <ul style="list-style-type: none"> • the date of payment. • the date of invoicing; and • the currency to be paid 		
X5	Sectional Completion			
X5.1	The <i>completion date</i> for each <i>section</i> of the <i>works</i> is:	Section	Description	Completion date
		1	Unit 1	End of Outage 127
		3	New Sensor Cask Building	End of Outage 127
X5 & X7	Sectional Completion and delay damages used together			
X7.1 X5.1	Delay damages for late Completion of the <i>sections</i> of the <i>works</i> are:	section	Description	Amount per day
		1	Unit 1	R35 000.00
		3	New Sensor Cask Building	R35 000.00
	Remainder of the <i>works</i>			R35 000.00
	The total delay damages payable by the <i>Contractor</i> does not exceed:	15% of the Prices at the Contract Date		

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X13	Performance bond	
X13.1	The amount of the performance bond is	10% of the Contract Prices
X14	Advanced Payment	
X14.1	The amount of the advanced payment is	To be in line with Contractor requirements but as low as possibly Note: Advance payments are only made if an Advance Payment Bond has been issued to the Employer
X16	Retention	
X16.1	The <i>retention free amount</i> is	20% of the prices at the Contract Data
	The <i>retention percentage</i> is	10%
X18	Limitation of liability	
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:	R0.0 (zero Rand)
X18.2	For any one event, the <i>Contractor's</i> liability to the <i>Employer</i> for loss of or damage to the <i>Employer's</i> property is limited to:	the amount of the deductibles relevant to the event
X18.3	The <i>Contractor's</i> liability for Defects due to his design which are not listed on the Defects Certificate is limited to	The greater of the total of the Prices at the Contract Date and the amounts excluded and unrecoverable from the <i>Employer's</i> assets policy for correcting the Defect (other than the resulting physical damage which is not excluded) plus the applicable deductible as at contract date.
X18.4	The <i>Contractor's</i> total liability to the <i>Employer</i> for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	the total of the Prices other than for the additional excluded matters. The <i>Contractor's</i> total liability for the additional excluded matters is not limited. The additional excluded matters are amounts for which the <i>Contractor</i> is liable under this contract for <ul style="list-style-type: none"> • Defects due to his design which arise before the Defects Certificate is issued, • Defects due to manufacture and fabrication outside the Site, • loss of or damage to property (other than the <i>works</i>, Plant and Materials), • death of or injury to a person and • infringement of an intellectual property right.

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X18.5	The <i>end of liability date</i> is	<p>(i) seven (7) years after the <i>defects date</i> for latent Defects and</p> <p>(ii) the date on which the liability in question prescribes in accordance with the Prescription Act No. 68 of 1969 (as amended or in terms of any replacement legislation) for any other matter.</p> <p>A latent Defect is a Defect which would not have been discovered on reasonable inspection by the <i>Employer</i> or the <i>Supervisor</i> before the <i>defects date</i>, without requiring any inspection not ordinarily carried out by the <i>Employer</i> or the <i>Supervisor</i> during that period.</p> <p>If the <i>Employer</i> or the <i>Supervisor</i> do undertake any inspection over and above the reasonable inspection, this does not place a greater responsibility on the <i>Employer</i> or the <i>Supervisor</i> to have discovered the Defect.</p>
Z	The Additional conditions of contract are	Z1 to Z15 always apply.
Z1	Cession delegation and assignment	
Z1.1	The <i>Contractor</i> does not cede, delegate, or assign any of its rights or obligations to any person without the written consent of the <i>Employer</i> .	
Z1.2	Notwithstanding the above, the <i>Employer</i> may on written notice to the <i>Contractor</i> cede and delegate its rights and obligations under this contract to any of its subsidiaries or any of its present divisions or operations which may be converted into separate legal entities as a result of the restructuring of the Electricity Supply Industry.	
Z2	Joint ventures	
Z2.1	If the <i>Contractor</i> constitutes a joint venture, consortium, or other unincorporated grouping of two or more persons or organisations then these persons or organisations are deemed to be jointly and severally liable to the <i>Employer</i> for the performance of this contract.	
Z2.2	Unless already notified to the <i>Employer</i> , the persons or organisations notify the <i>Project Manager</i> within two weeks of the Contract Date of the key person who has the authority to bind the <i>Contractor</i> on their behalf.	
Z2.3	The <i>Contractor</i> does not alter the composition of the joint venture, consortium, or other unincorporated grouping of two or more persons without the consent of the <i>Employer</i> having been given to the <i>Contractor</i> in writing.	
Z3	Change of Broad Based Black Economic Empowerment (B-BBEE) status	
Z3.1	Where a change in the <i>Contractor's</i> legal status, ownership or any other change to his business composition or business dealings results in a change to the <i>Contractor's</i> B-BBEE status, the <i>Contractor</i> notifies the <i>Employer</i> within seven days of the change.	

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Z3.2	The <i>Contractor</i> is required to submit an updated verification certificate and necessary supporting documentation confirming the change in his B-BBEE status to the <i>Project Manager</i> within thirty days of the notification or as otherwise instructed by the <i>Project Manager</i> .
Z3.3	Where, as a result, the <i>Contractor's</i> B-BBEE status has decreased since the Contract Date the <i>Employer</i> may either re-negotiate this contract or alternatively, terminate the <i>Contractor's</i> obligation to Provide the Works.
Z3.4	Failure by the <i>Contractor</i> to notify the <i>Employer</i> of a change in its B-BBEE status may constitute a reason for termination. If the <i>Employer</i> terminates in terms of this clause, the procedures on termination are P1, P2 and P3 as stated in clause 92, and the amount due is A1 and A3 as stated in clause 93.
Z4	Confidentiality
Z4.1	The <i>Contractor</i> does not disclose or make any information arising from or in connection with this contract available to Others. This undertaking does not, however, apply to information which at the time of disclosure or thereafter, without default on the part of the <i>Contractor</i> , enters the public domain or to information which was already in the possession of the <i>Contractor</i> at the time of disclosure (evidenced by written records in existence at that time). Should the <i>Contractor</i> disclose information to Others in terms of clause 25.1, the <i>Contractor</i> ensures that the provisions of this clause are complied with by the recipient.
Z4.2	If the <i>Contractor</i> is uncertain about whether any such information is confidential, it is to be regarded as such until notified otherwise by the <i>Project Manager</i> .
Z4.3	In the event that the <i>Contractor</i> is, at any time, required by law to disclose any such information which is required to be kept confidential, the <i>Contractor</i> , to the extent permitted by law prior to disclosure, notifies the <i>Employer</i> so that an appropriate protection order and/or any other action can be taken if possible, prior to any disclosure. In the event that such protective order is not, or cannot, be obtained, then the <i>Contractor</i> may disclose that portion of the information which it is required to be disclosed by law and uses reasonable efforts to obtain assurances that confidential treatment will be afforded to the information so disclosed.
Z4.4	The taking of images (whether photographs, video footage or otherwise) of the <i>works</i> or any portion thereof, in the course of Providing the Works and after Completion, requires the prior written consent of the <i>Project Manager</i> . All rights in and to all such images vests exclusively in the <i>Employer</i> .
Z4.5	The <i>Contractor</i> ensures that all his subcontractors abide by the undertakings in this clause.
Z5	Waiver and estoppel: Add to core clause 12.3:
Z5.1	Any extension, concession, waiver, or relaxation of any action stated in this contract by the Parties, the <i>Project Manager</i> , the <i>Supervisor</i> , or the <i>Adjudicator</i> does not constitute a waiver of rights and does not give rise to an estoppel unless the Parties agree otherwise and confirm such agreement in writing.
Z6	Health, safety, and the environment: Add to core clause 27.4
Z6.1	The <i>Contractor</i> undertakes to take all reasonable precautions to maintain the health and safety of persons in and about the execution of the <i>works</i> . Without limitation the <i>Contractor</i> : <ul style="list-style-type: none"> • accepts that the <i>Employer</i> may appoint him as the "Principal Contractor" (as defined and provided for under the Construction Regulations 2014 (promulgated under the Occupational Health & Safety Act 85 of 1993) ("the Construction Regulations") for the Site. • warrants that the total of the Prices as at the Contract Date includes a sufficient amount for proper compliance with the Construction Regulations, all applicable health & safety laws and

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	<p>regulations and the health and safety rules, guidelines and procedures provided for in this contract and generally for the proper maintenance of health & safety in and about the execution of <i>works</i>; and</p> <ul style="list-style-type: none"> undertakes, in and about the execution of the <i>works</i>, to comply with the Construction Regulations and with all applicable health & safety laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the <i>Contractor's</i> direction and control, likewise observe and comply with the foregoing.
Z6.2	The <i>Contractor</i> , in and about the execution of the <i>works</i> , complies with all applicable environmental laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the <i>Contractor's</i> direction and control, likewise observe and comply with the foregoing.
Z7	Provision of a Tax Invoice and interest. Add to core clause 51
Z7.1	Within one week of receiving a payment certificate from the <i>Project Manager</i> in terms of core clause 51.1, the <i>Contractor</i> provides the <i>Employer</i> with a tax invoice in accordance with the <i>Employer's</i> procedures stated in the Works Information, showing the amount due for payment equal to that stated in the payment certificate.
Z7.2	If the <i>Contractor</i> does not provide a tax invoice in the form and by the time required by this contract, the time by when the <i>Employer</i> is to make a payment is extended by a period equal in time to the delayed submission of the correct tax invoice. Interest due by the <i>Employer</i> in terms of core clause 51.2 is then calculated from the delayed date by when payment is to be made.
Z7.3	The <i>Contractor</i> (if registered in South Africa in terms of the companies Act) is required to comply with the requirements of the Value Added Tax Act, no 89 of 1991 (as amended) and to include the <i>Employer's</i> VAT number 4740101508 on each invoice he submits for payment.
Z8	Notifying compensation events
Z8.1	Delete from the last sentence in core clause 61.3, "unless the <i>Project Manager</i> should have notified the event to the <i>Contractor</i> but did not".
Z8.2	Add to core clause 62.3, "The <i>Project Manager's</i> reply which is an acceptance of a quotation for a compensation event may require the due authority of the <i>Employer</i> ."
Z8.3	Add to core clause 62.5, "The <i>Project Manager</i> notifies the <i>Contractor</i> if the <i>Employer's</i> authority is required and includes in his notification any extension to the period within which he is required to reply to the <i>Contractor's</i> quotation.
Z9	<i>Employer's</i> limitation of liability
Z9.1	The <i>Employer's</i> liability to the <i>Contractor</i> for the <i>Contractor's</i> indirect or consequential loss is limited to R0.00 (zero Rand)
Z9.2	The <i>Contractor's</i> entitlement under the indemnity in 83.1 is provided for in 60.1(14) and the <i>Employer's</i> liability under the indemnity is limited.
Z10	Termination: Add to core clause 91.1, at the second main bullet point, fourth sub-bullet point, after the words "against it":
Z10.1	or had a business rescue order granted against it.

Z11	Addition to secondary Option X7 Delay damages
Z11.1	If the amount due for the <i>Contractor's</i> payment of delay damages reaches the limits stated in this Contract Data for Option X7 or Options X5 and X7 used together, the <i>Employer</i> may terminate the <i>Contractor's</i> obligation to Provide the Works using the same procedures and payment on termination as those applied for reasons R1 to R15 or R18 stated in the Termination Table.

Z12 Ethics

For the purposes of this Z-clause, the following definitions apply:

Affected Party means, as the context requires, any party, irrespective of whether it is the *Contractor* or a third party, such party's employees, agents, or Subcontractors or Subcontractor's employees, or any one or more of all of these parties' relatives or friends,

Coercive Action means to harm or threaten to harm, directly or indirectly, an Affected Party or the property of an Affected Party, or to otherwise influence or attempt to influence an Affected Party to act unlawfully or illegally,

Collusive Action means where two or more parties co-operate to achieve an unlawful or illegal purpose, including to influence an Affected Party to act unlawfully or illegally,

Committing Party means, as the context requires, the *Contractor*, or any member thereof in the case of a joint venture, or its employees, agents, or Subcontractor or the Subcontractor's employees,

Corrupt Action means the offering, giving, taking, or soliciting, directly or indirectly, of a good or service to unlawfully or illegally influence the actions of an Affected Party,

Fraudulent Action means any unlawfully or illegally intentional act or omission that misleads, or attempts to mislead, an Affected Party, in order to obtain a financial or other benefit or to avoid an obligation or incurring an obligation,

Obstructive Action means a Committing Party unlawfully or illegally destroying, falsifying, altering or concealing information or making false statements to materially impede an investigation into allegations of Prohibited Action, and

Prohibited Action means any one or more of a Coercive Action, Collusive Action Corrupt Action, Fraudulent Action, or Obstructive Action.

Z12.1 A Committing Party may not take any Prohibited Action during the course of the procurement of this contract or in execution thereof.

Z12.2 The *Employer* may terminate the *Contractor's* obligation to Provide the Services if a Committing Party has taken such Prohibited Action and the *Contractor* did not take timely and appropriate action to prevent or remedy the situation, without limiting any other rights or remedies the *Employer* has. It is not required that the Committing Party had to have been found guilty, in court or in any other similar process, of such Prohibited Action before the *Employer* can terminate the *Contractor's* obligation to Provide the Services for this reason.

Z12.3 If the *Employer* terminates the *Contractor's* obligation to Provide the Services for this reason, the amounts due on termination are those intended in core clauses 92.1 and 92.2.

Z12.4 A Committing Party co-operates fully with any investigation pursuant to alleged Prohibited Action. Where the *Employer* does not have a contractual bond with the Committing Party, the *Contractor* ensures that the Committing Party co-operates fully with an investigation.

Z13 Insurance

Z 13.1 Replace core clause 84 with the following:

Insurance cover 84

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- 84.1** When requested by a Party, the other Party provides certificates from his insurer or broker stating that the insurances required by this contract are in force.
- 84.2** The *Contractor* provides the insurances stated in the Insurance Table A.
- 84.3** The insurances provide cover for events which are at the *Contractor's* risk from the *starting date* until the earlier of Completion and the date of the termination certificate.

INSURANCE TABLE A

Insurance against	Minimum amount of cover or minimum limit of indemnity
Loss of or damage to the <i>works</i> , Plant and Materials	The replacement cost where covered by the <i>Employ</i> insurance. The <i>Employer's</i> policy deductibl as at Contract Date, wh covered by the <i>Employ</i> insurance
Loss of or damage to Equipment	The replacement cost
Liability for loss of or damage to property (except the <i>works</i> , Plant and Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) caused by activity in connection with this contract	<u>Loss of or damage to property</u> <u><i>Employer's</i> property</u> The replacement cost where covered by the <i>Employ</i> insurance. The <i>Employer's</i> policy deductibl as at Contract Date, wh covered by the <i>Employ</i> insurance. <u>Other property</u> The replacement cost. <u>Bodily injury to or death o person</u> The amount required by applice law
Liability for death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract	The amount required by applicable law

Z 13.2

Replace core clause 87 with the following:

The *Employer* provides the insurances stated in the Insurance Table B.

INSURANCE TABLE B

Insurance against or name of policy	Minimum amount of cover or minimum of indemnity
-------------------------------------	-------------------------------------------------

Assets All Risk	Per the insurance policy document
Contract Works insurance	Per the insurance policy document
Environmental Liability	Per the insurance policy document
General and Public Liability	Per the insurance policy document
Transportation (Marine)	Per the insurance policy document
Motor Fleet and Mobile Plant	Per the insurance policy document
Terrorism	Per the insurance policy document
Cyber Liability	Per the insurance policy document
Nuclear Material Damage and Business Interruption	Per the insurance policy document
Nuclear Material Damage Terrorism	Per the insurance policy document

Z14 Nuclear Liability

- Z14.1 The *Employer* is the operator of the Koeberg Nuclear Power Station (KNPS), a nuclear installation, as designated by the National Nuclear Regulator of the Republic of South Africa and is the holder of a nuclear licence in respect of the KNPS.
- Z14.2 The *Employer* is solely responsible for and indemnifies the *Contractor* or any other person against any and all liabilities which the *Contractor* or any person may incur arising out of or resulting from nuclear damage, as defined in Act 47 of 1999, save to the extent that any liabilities are incurred due to the unlawful intent of the *Contractor* or any other person or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.
- Z14.3 Subject to clause Z14.4 below, the *Employer* waives all rights of recourse, arising from the aforesaid, save to the extent that any claims arise, or liability is incurred due or attributable to the unlawful intent of the *Contractor* or any other person, or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.
- Z14.4 The *Employer* does not waive its rights provided for in section 30 (7) of Act 47 of 1999, or any replacement section dealing with the same subject matter.
- Z14.5 The protection afforded by the provisions hereof shall be in effect until the KNPS is decommissioned.

Z15 Asbestos

For the purposes of this Z-clause, the following definitions apply:

- AAIA** means approved asbestos inspection authority.
- ACM** means asbestos containing materials.
- AL** means action level, i.e. a level of 50% of the OEL, i.e. 0.1 regulated asbestos fibres per ml of air measured over a 4 hour period. The value at which proactive actions is required in order to control asbestos exposure to prevent exceeding the OEL.
- Ambient Air** means breathable air in area of work with specific reference to breathing zone, which is defined to be a virtual area within a radius of approximately 30cm from the nose inlet.
- Compliance Monitoring** means compliance sampling used to assess whether or not the personal exposure of workers to regulated asbestos fibres is in compliance with the Standard's

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requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment, and articles.

OEL	means occupational exposure limit.
Parallel Measurements	means measurements performed in parallel, yet separately, to existing measurements to verify validity of results.
Safe Levels	means airborne asbestos exposure levels conforming to the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment, and articles.
Standard	means the <i>Employer's</i> Asbestos Standard 32-303: Requirements for Safe Processing, Handling, Storing, Disposal and Phase-out of Asbestos and Asbestos Containing Material, Equipment and Articles.
SANAS	means the South African National Accreditation System.
TWA	means the average exposure, within a given workplace, to airborne asbestos fibres, normalised to the baseline of a 4-hour continuous period, also applicable to short term exposures, i.e. 10-minute TWA.

- Z15.1 The *Employer* ensures that the Ambient Air in the area where the *Contractor* will Provide the Services conforms to the acceptable prescribed South African standard for asbestos, as per the regulations published in GNR 155 of 10 February 2002, under the Occupational Health and Safety Act, 1993 (Act 85 of 1993) ("Asbestos Regulations"). The OEL for asbestos is 0.2 regulated asbestos fibres per millilitre of air as a 4-hour TWA, averaged over any continuous period of four hours, and the short-term exposure limit of 0.6 regulated asbestos fibres per millilitre of air as a 10-minute TWA, averaged over any 10 minutes, measured in accordance with HSG248 and monitored according to HSG173 and OESSM.
- Z15.2 Upon written request by the *Contractor*, the *Employer* certifies that these conditions prevail. All measurements and reporting are effected by an independent, competent, and certified occupational hygiene inspection body, i.e. a SANAS accredited, and Department of Employment and Labour approved AAIA. The *Contractor* may perform Parallel Measurements and related control measures at the *Contractor's* expense. For the purposes of compliance, the results generated from Parallel Measurements are evaluated only against South African statutory limits as detailed in clause Z15.1. Control measures conform to the requirements stipulated in the AAIA-approved asbestos work plan.
- Z15.3 The *Employer* manages asbestos and ACM according to the Standard.
- Z15.4 In the event that any asbestos is identified while Providing the Services, a risk assessment is conducted and if so required, with reference to possible exposure to an airborne concentration of above the AL for asbestos, immediate control measures are implemented, and relevant air monitoring conducted in order to declare the area safe.
- Z15.5 The *Contractor's* personnel are entitled to stop working and leave the contaminated area forthwith until such time that the area of concern is declared safe by either Compliance Monitoring or an AAIA approved control measure intervention, for example, per the emergency asbestos work plan, if applicable.
- Z15.6 The *Contractor* continues to Provide the Services, without additional control measures presented, on presentation of Safe Levels. The contractually agreed dates to Provide the Services, including the Completion Date, are adjusted accordingly. The contractually agreed dates are extended by the notification periods required by regulations 3 and 21 of the Asbestos Regulations, 2001.
- Z15.7 Any removal and disposal of asbestos, asbestos containing materials and waste, is done by a registered asbestos contractor, instructed by the *Employer* at the *Employer's* expense, and conducted in line with South African legislation.

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Annexure A: One-in-ten-year-return weather data obtained from SA Weather Bureau for [weather station]

If any one of these *weather measurements* recorded within a calendar month, before the Completion Date for the whole of the *works* and at the place stated in this Contract Data is shown to be more adverse than the amount stated below then the *Contractor* may notify a compensation event.

Weather measurement											
Month	Average Minimum Temp in Cape Town, South Africa (°C)	Average Maximum Temp in Cape Town, South Africa (°C)	Cape Town Average Temp (°C)	Average Sea Temp (°C)	Average Precipitation/Rainfall (mm)	Wet Days (>0.1 mm)	Average Sunlight Hours/Day	Relative Humidity (%)	Average Wind Speed in Cape Town (Beaufort)	Average Number of Days with Frost	
Weather in Cape Town in January	16	26	21	19	16	4	10.9	71	4	0	Average Temperature in Cape Town in January
Weather in Cape Town in February	16	26	21	18	15	4	10.4	73	4	0	Average Temperature in Cape Town in February
Weather in Cape Town in March	14	25	20	17	22	5	9.1	77	3	0	Average Temperature in Cape Town in March
Weather in Cape Town in April	12	22	17	17	51	8	6.9	80	3	0	Average Temperature in Cape Town in April
Weather in Cape Town in May	10	20	15	16	97	12	5.9	83	3	0	Average Temperature in Cape Town in May
Weather in Cape Town in June	8	18	13	16	108	13	6.0	83	3	0	Average Temperature in Cape Town in June
Weather in Cape Town in July	7	17	12	15	94	13	5.7	83	3	0	Average Temperature in Cape Town in July
Weather in Cape Town in August	8	18	13	15	85	12	6.4	82	3	0	Average Temperature in Cape Town in August
Weather in Cape Town in September	9	19	14	15	57	10	6.4	79	3	0	Average Temperature in Cape Town in September
Weather in Cape Town in October	11	21	16	16	40	9	8.9	76	4	0	Average Temperature in Cape Town in October
Weather in Cape Town in November	13	23	18	17	25	6	9.9	74	4	0	Average Temperature in Cape Town in November
Weather in Cape Town in December	14	25	19.6	18	19	5	11.1	71	4	0	Average Temperature in Cape Town in December

Only the difference between the more adverse recorded weather and the equivalent measurement given above is taken into account in assessing a compensation event.

Specific consideration shall be given during the transportation of the steam generators to:

- Average hourly wind speeds greater than or equal to Force eight (8), and
- Total rainfall of more than twenty-five (25) mm in a twenty-four (24) hour period.

C1.2 Contract Data

Part two - Data provided by the Contractor

Notes to a tendering contractor:

1. Please read both the NEC3 Engineering and Construction Contract (April 2013) and the relevant parts of its Guidance Notes (ECC3-GN)² in order to understand the implications of this Data which the tenderer is required to complete. An example of the completed Data is provided on pages 156 to 158 of the ECC3 (April 2013) Guidance Notes.
2. The number of the clause which requires the data is shown in the left hand column for each statement however other clauses may also use the same data
3. Where a form field like this [] appears, data is required to be inserted relevant to the option selected. Click on the form field **once** and type in the data. Otherwise complete by hand and in ink.

Completion of the data in full, according to Options chosen, is essential to create a complete contract.

Clause	Statement	Data
10.1	The <i>Contractor</i> is (Name): Address Tel No. Fax No.	
11.2(8)	The <i>direct fee percentage</i> is Note: direct fee percentage is applied to the Defined Cost of other work Please insert percentage The <i>subcontracted fee percentage</i> is Note: subcontracted fee percentage is applied to the Defined Cost of subcontracted work Please insert percentage	% %
11.2(18)	The <i>working areas</i> are the Site and Note: It is important that the Contractor fully describes the Working Areas to include not just the Site (the boundaries of which are defined by the Employer in Contract Data Part 1) but all areas where work connected with the contract is to be performed. With the exception of manufacture, fabrication, and design work, which may be performed outside the working areas and paid as such, only the cost of resources working within the Working Areas qualify as Defined Cost for payment purposes. Hence the importance of fully describing the Working Areas. Please insert areas	

² Available from Engineering Contract Strategies Tel 011 803 3008, Fax 011 803 3009 or see www.ecs.co.za

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<p>24.1</p>	<p>The <i>Contractor's</i> key persons are: Please insert the name, job, responsibilities, qualifications, and experience of its key people. Provide for additional key persons if necessary. Note: Ensure that the key people listed have direct involvement with the contract (not CEO, MD, ED's of company or parent company unless the individual has an active role in the contract)</p> <p>1 Name: Job: Responsibilities: Qualifications: Experience:</p> <p>2 Name: Job: Responsibilities: Qualifications: Experience:</p>	<p>CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .</p>
<p>11.2(3)</p>	<p>The <i>completion date</i> for the whole of the <i>works</i> is</p>	
<p>11.2(14)</p>	<p>The following matters will be included in the Risk Register Note: The listing of risks on the Risk Register does not have the effect of fixing either of the parties with any particular risk.</p>	
<p>11.2(19)</p>	<p>The Works Information for the <i>Contractor's</i> design is in:</p>	
<p>31.1</p>	<p>The programme identified in the Contract Data is</p>	

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A	Priced contract with activity schedule	
11.2(20)	The <i>activity schedule</i> is in Note: The Activity Schedule is used for payment purposes Please insert a reference to the list of activities prepared by the Tenderer which he expects to carry out in Providing the Works indicating a lump sum for each activity	
11.2(30)	The tendered total of the Prices is	ZAR EUR GBP CHF (in figures) (in words), excluding VAT
	Data for Schedules of Cost Components	<i>Note “SCC” means Schedule of Cost Components starting on page 60, and “SSCC” means Shorter Schedule of Cost Components starting on page 63 of ECC3 (April 2013).</i>
A	Priced contract with activity schedule	Data for the Shorter Schedule of Cost Components
41 in SSCC	The percentage for people overheads is: Relevant People costs (such costs being those paid by the <i>Contractor</i> , including legally required and pension payments, for those people directly employed or paid by the <i>Contractor</i> according to the time worked and whose place of work is within the Working Areas) are determined by reference to the “Shorter Schedule of Cost Components”. The Tenderer then applies to those costs as a percentage for people overheads. <ul style="list-style-type: none">• This has the same purpose as the percentage for Working Area overheads but is for use only when the Shorter Schedule of Cost Components is used.• The Shorter Schedule is used with Options A for the purposes of assessing compensation events. Please insert percentage	%
21 in SSCC	The published list of Equipment is the last edition of the list published by The percentage for adjustment for Equipment in the published list is	Minus %

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<p>22 in SSCC</p>	<p>The rates of other Equipment are:</p> <p>Note: For use with the Shorter Schedule of Cost Components</p>	<p>Equipment</p>	<p>Size or capacity</p>	<p>Rate</p>
<p>61 in SSCC</p>	<p>The hourly rates for Defined Cost of design outside the Working Areas are</p> <p>Note: Hourly rates are estimated 'cost to company of the employee' and not selling rates.</p> <p>Please insert another schedule if foreign resources may also be used</p> <p>For use with the e Shorter Schedule of Cost Components</p>	<p>Category of employee</p>		<p>Hourly rate</p>
<p>62 in SSCC</p>	<p>The percentage for design overheads is:</p> <p>Note: a percentage to cover the overhead costs in relation to Design outside the Working Areas.</p> <p>Note: For use with the e Shorter Schedule of Cost Components</p>	<p>%</p>		
<p>63 in SSCC</p>	<p>The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:</p>			

C1.3 Forms of Securities

Pro formas for Bonds & Guarantees

For use with the NEC3 Engineering & Construction Contract

The *conditions of contract* stated in the Contract Data Part 1 include the following Secondary Options:

Option X13: Performance Bond

Option X14: Advanced payment to the *Contractor*

Each of these secondary Options requires a bond or guarantee “in the form set out in the Works Information”. Pro forma documents for these bonds and guarantees are provided here for convenience but are to be treated as part of the Works Information.

Option X16: Retention (not used with Option F)

The *Contractor* may provide a Retention Money Guarantee in the form stated here. When the *Employer* receives and accepts a Retention Money Guarantee exactly in the form stated he will instruct the *Project Manager* not to assess any amount be retained in terms of secondary Option X16.

The *Contractor* shall guarantee his ASGI-SA Obligations by providing the *Employer* with an ASGI-SA Guarantee in the form provided here.

The organisation providing the bond / guarantee does so by copying the pro forma document onto his letterhead without any change to the text or format and completing the required details. The completed document is then given to the *Employer* within the time stated in the contract.

Pro forma Performance Bond – Demand Guarantee (for use with Option X13)

(to be reproduced exactly as shown below on the letterhead of the Contractor's Parent Company)

Eskom Holdings SOC Ltd
Megawatt Park
Maxwell Drive
Sandton
Johannesburg

Date:

Dear Sirs

Reference No. [●] [Drafting Note: Bank reference number to be inserted]

Performance Bond – Demand Guarantee: [Drafting Note: Name of Contractor to be inserted]

Project [] Contract Reference: [Drafting Note: Contractor contract reference number to be inserted]

1. In this Guarantee the following words and expressions shall have the following meanings:-
 - 1.1 "Bank" - means [●], [●] Branch, (Registration No. [●]); [Drafting Note: Name of Bank to be inserted]
 - 1.2 "Bank's Address" - means [●]; [Drafting Note: Bank's physical address to be inserted]
 - 1.3 "Contract" – means the written agreement relating to the Project, entered into between Eskom and the Contractor, on or about the [●] day of [●] 200[●] (Contract Reference No. [.]as amended, varied, restated, novated, or substituted from time to time; [Drafting Note: Signature Date and Contract reference number to be inserted])
 - 1.4 "Contractor" – means [●] a company registered in accordance with the laws of [●] under Registration Number [●]. [Drafting Note: Name and details of Contractor to be inserted]
 - 1.5 "Eskom" - means Eskom Holdings SOC Ltd, a company registered in accordance with the laws of the Republic of South Africa under Registration Number 2002/015527/30].
 - 1.6 "Expiry Date" - means the date on which the Defects Certificate is issued in terms of the Contract.
 - 1.7 "Guaranteed Sum" - means the sum of R [●] ([●] Rand);
 - 1.8 "Project" - means [insert if applicable].
2. At the instance of the Contractor, we the undersigned _____ and _____, in our respective capacities as _____ and _____ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of Eskom, as security for the proper performance by the Contractor of all of its obligations in terms of and arising from the Contract and hereby undertake to pay to Eskom, on written demand from Eskom received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.
3. A demand for payment under this guarantee shall be made in writing at the Bank's address and shall:
 - 3.1 be signed on behalf of Eskom by a Group Executive, Divisional Executive, Senior General Manager, General Manager or its delegate;
 - 3.2 state the amount claimed ("the Demand Amount");
 - 3.3 state that the Demand Amount is payable to Eskom in the circumstances contemplated in the Contract.

4. Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank's obligation/s to make payment:
 - 4.1 is and shall be absolute provided demand is made in terms of this bond in all circumstances; and
 - 4.2 is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.
5. The Bank's obligations in terms of this Guarantee:
 - 5.1 shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and
 - 5.2 shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed, by the fact that a dispute may exist between Eskom and the *Contractor*.
6. Eskom shall be entitled to arrange its affairs with the *Contractor* in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release, or compromise granted to the *Contractor* or any variation under or to the Contract.
7. Should Eskom cede its rights against the *Contractor* to a third party where such cession is permitted under the Contract, then Eskom shall be entitled to cede to such third party the rights of Eskom under this Guarantee on written notification to the Bank of such cession.
8. This Guarantee:
 - 8.1 shall expire on the Expiry Date until which time it is irrevocable;
 - 8.2 is, save as provided for in 7 above, personal to Eskom and is neither negotiable nor transferable;
 - 8.3 shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof;
 - 8.4 shall be regarded as a liquid document for the purpose of obtaining a court order; and
 - 8.5 shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the Courts of the Republic of South Africa.
 - 8.6 Any claim which arises or demand for payment received after expiry date will be invalid and unenforceable.
9. The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at _____ Date _____

For and behalf of the Bank

Bank Signatory: _____ Bank Signatory: _____

Witness: _____ Witness: _____
Bank's seal or stamp

Pro forma Advanced Payment Bond (for use with Option X14)

(to be reproduced exactly as shown below on the letterhead of the Bank providing the Bond)

Eskom Holdings Limited
Megawatt Park
Maxwell Drive
Sandton
Johannesburg

Date:

Dear Sirs,

Advanced Payment Bond for Contract No.

With reference to the above numbered contract made or to be made between

Eskom Holdings SOC Limited

(the *Employer*) and

{Insert registered name and address of the Contractor}

(the *Contractor*), for

{Insert details of the works from the Contract Data}

(the *works*).

I/We the undersigned

on behalf of the Surety

of physical address

and duly authorised thereto do hereby bind ourselves as Surety and co-principal debtors in solidum for the due and proper repayment by the *Contractor* to the *Employer* of the advanced payment made by the *Employer* to the *Contractor* under the Contract, and for all losses and expenses that may be suffered or incurred by the *Employer* as a result of non-payment by the *Contractor*, subject to the following conditions

1. The terms *Employer*, *Contractor*, and the *works* have the meaning as assigned to them by the *conditions of contract* listed in the Contract Data for the aforesaid Contract.
2. We renounce all benefits from the legal exceptions "Benefit of Excussion and Division", "No value received" "Revision of Accounts", "Cession of Action" and any other exceptions which might or could be pleaded against the validity of this bond, with the meaning and effect of which exceptions we declare ourselves to be fully acquainted.
3. The *Employer* has the absolute right to arrange his affairs with the *Contractor* in any manner which the *Employer* deems fit and without being advised thereof the Surety shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the Surety. Without derogating from the foregoing compromise, extension of the construction period, indulgence, release, or variation of the *Contractor's* obligation shall not affect the validity of this Advance Payment bond.
4. This bond expires on the date when the Surety receives a notice from the *Project Manager* stating that the advanced payment has been repaid to the *Employer* in terms of the Contract or liquidated by deductions from other payments due to the *Contractor*.
5. The amount of the bond shall be payable to the *Employer* upon the *Employer's* demand and no later than 7 days following the submission to the Surety of a certificate signed by the *Project Manager* stating the amount of the *Employer's* losses, damages and expenses incurred as a result of the non-performance aforesaid. The signed certificate shall be deemed to be conclusive proof of the extent of the *Employer's* loss, damage and expense.

- 6. Our total liability hereunder shall not exceed the sum of (R) which is equal to the advance payment.
- 7. This Advanced Payment Bond is neither negotiable nor transferable and is governed by the laws of the Republic of South Africa.

Signed at _____ on this _____ day of _____ 200_

Signature(s)	_____
Name(s) (printed)	_____
Position in Surety company	_____
Signature of Witness(s)	_____
Name(s) (printed)	_____

Pro forma Retention Money Guarantee (may be used when Option X16 applies)

(to be reproduced exactly as shown below on the letterhead of the Bank providing the Guarantee)

Eskom Holdings SOC Limited
Megawatt Park
Maxwell Drive
Sandton
Johannesburg

Date:

Dear Sirs

Reference No. [●] [Drafting Note: Bank reference number to be inserted]

Retention Money Guarantee: [Drafting Note: Name of Contractor to be inserted]

Project [] : Contract Reference: [Drafting Note: Contractor contract reference number to be inserted]

1. In this Guarantee the following words and expressions shall have the following meanings: -
 - 1.1 "Bank" - means [●], [●] Branch, (Registration No. [●]); [Drafting Note: Name of Bank to be inserted]
 - 1.2 "Bank's Address" - means [●]; [Drafting Note: Bank's physical address to be inserted]
 - 1.3 "Contract" – means the written agreement relating to the Project, entered into between Eskom and the *Contractor*, on or about the [●] day of [●] 200[●] (Contract Reference No. as amended, varied, restated, novated or substituted from time to time; [Drafting Note: Signature Date and Contract reference number to be inserted])
 - 1.4 "*Contractor*" – means [●] a company registered in accordance with the laws of [●] under Registration Number [●]. [Drafting Note: Name and details of *Contractor* to be inserted]
 - 1.5 "Eskom" - means Eskom Holdings SOC Limited, a company registered in accordance with the laws of the Republic of South Africa under Registration Number 2002/015527/30.
 - 1.6 "Expiry Date" - means the date on which the Defects Certificate is issued in terms of the Contract.
 - 1.7 "Guaranteed Sum" - means the sum of R [●] ([●] Rand); [Drafting Note: Insert amount of Retention Money Guarantee.].
 - 1.8 "Project" - means the.....
2. At the instance of the *Contractor*, we the undersigned _____ and _____, in our respective capacities as _____ and _____ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of Eskom, as security for the proper performance by the *Contractor* of all of its obligations in terms of and arising from the Contract and hereby undertake to pay to Eskom, on written demand from Eskom received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.
3. A demand for payment under this guarantee shall be made in writing at the Bank's address and shall:
 - 3.1 be signed on behalf of Eskom by a director of Eskom or his authorised delegate.
 - 3.2 state the amount claimed ("the Demand Amount");
 - 3.3 state that the *Contractor* has failed to carry out his obligation(s) to rectify certain defect(s) for which he is responsible under the Contract (and the nature of such defect(s)) alternatively that the Demand Amount is payable to Eskom in the circumstances contemplated in the Contract.

4. Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank's obligation/s to make payment:
- 4.1 is and shall be absolute provided demand is made in terms of this bond in all circumstances; and
- 4.2 is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.
5. The Bank's obligations in terms of this Guarantee:
- 5.1 shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and
- 5.2 shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed by the fact that a dispute may exist between Eskom and the *Contractor*.
6. Eskom shall be entitled to arrange its affairs with the *Contractor* in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the *Contractor* or any variation under or to the Contract.
7. Should Eskom cede its rights against the *Contractor* to a third party where such cession is permitted under the Contract, then Eskom shall be entitled to cede to such third party the rights of Eskom under this Guarantee on written notification to the Bank of such cession.
8. This Guarantee:
- 8.1 shall expire on the Expiry Date until which time it is irrevocable.
- 8.2 is, save as provided for in 7 above, personal to Eskom and is neither negotiable nor transferable.
- 8.3 shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof.
- 8.4 shall be regarded as a liquid document for the purpose of obtaining a court order; and
- 8.5 shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the Courts of the Republic of South Africa.
- 8.6 Any claim which arises or demand for payment received after expiry date will be invalid and unenforceable.
9. The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at _____ Date _____ Bank's seal or stamp

For and behalf of the Bank

Bank Signatory: _____ Bank Signatory: _____

Witness: _____ Witness: _____

Part 2: Pricing Data

ECC3 Option A

Document reference	Title	No of pages
C2.1	Pricing assumptions: Option A	2
C2.2	The <i>activity schedule</i>	1
	Total number of pages	3

C2.1 Pricing assumptions: Option A

1. How work is priced and assessed for payment

Clause 11 in NEC3 Engineering and Construction Contract, (ECC3) Option A states:

Identified and defined terms 11 11.2 (20) The Activity Schedule is the *activity schedule* unless later changed in accordance with this contract.

(27) The Price for Work Done to Date is the total of the Prices for

- each group of completed activities and
- each completed activity which is not in a group.

A completed activity is one which is without Defects which would either delay or be covered by immediately following work.

(30) The Prices are the lump sum prices for each of the activities on the Activity Schedule unless later changed in accordance with this contract.

This confirms that Option A is a lump sum form of contract where the work is broken down into activities, each of which is priced by the tendering contractor as a lump sum. Only completed activities are assessed for payment at each assessment date; no part payment is made if the activity is not completed by the assessment date.

2. Function of the Activity Schedule

Clause 54.1 in Option A states: "Information in the Activity Schedule is not Works Information or Site Information". This confirms that specifications and descriptions of the work or any constraints on how it is to be done are not included in the Activity Schedule but in the Works Information. This is further confirmed by Clause 20.1 which states, "The *Contractor* Provides the Works in accordance with the Works Information". Hence the *Contractor* does **not** Provide the Works in accordance with the Activity Schedule. The Activity Schedule is only a pricing document.

3. Link to the programme

Clause 31.4 states that "The *Contractor* provides information which shows how each activity on the Activity Schedule relates to the operations on each programme which he submits for acceptance". Ideally the tendering contractor will develop a high level programme first then resource each activity and thus arrive at the lump sum price for that activity both of which can be entered into the *activity schedule*.

4. Preparing the activity schedule

Generally it is the tendering contractor who prepares the *activity schedule* by breaking down the work described within the Works Information into suitable activities which can be well defined, shown on a programme and priced as a lump sum.

The *Employer*, in his Instructions to Tenderers or in a Tender Schedule, may have listed some items that he requires the *Contractor* to include in his *activity schedule* and be priced accordingly.

It is assumed that in preparing his *activity schedule* the *Contractor*:

- Has taken account of the guidance given in the ECC3 Guidance Notes pages 19 and 20.
- Understands the function of the Activity Schedule and how work is priced and paid for.
- Is aware of the need to link the Activity Schedule to activities shown on his programme.
- Has listed and priced activities in the *activity schedule* which are inclusive of everything necessary and incidental to Providing the Works in accordance with the Works Information, as it was at the time of tender, as well as correct any Defects not caused by an *Employer's* risk.
- Has priced work he decides not to show as a separate activity within the Prices of other listed activities in order to fulfil the obligation to complete the *works* for the tendered total of the Prices.
- Understands there is no adjustment to the lump sum Activity Schedule price if the amount, or quantity, of work within that activity later turns out to be different to that which the *Contractor* estimated at time of tender. The only basis for a change to the Prices is as a result of a compensation event.

C2.2 the *activity schedule*

Activity Schedule

Item No.	Programme Reference	Activity description	Price (Excl. Vat)
		Engineering interface design study	
		Scheme design	
		Installation (detail) design	
		Providing support for regulatory approval per section (resolution of regulator review comments)	
		Work Plan	
		Supply and delivery of all plant material including qualification test reports to Koeberg Nuclear Power Station	
		Unit 1 implementation, commissioning, and waste removal	
		Training of Koeberg personnel.	
		Documentation compile and update	
		Total (Excl. Vat)	

NOTES:

- All prices and rates exclude VAT.
- The rates and prices are to remain fixed for the first 12 months of the contract period. Thereafter, the rates and prices will be subject to an annual adjustment with 15% remaining fixed for the contract period and 85% subject to adjustment. The applicable index shall be as per Option X1 of the Contract Data, base date One month prior to closing of the tender.
- When services are requested on a lump sum basis, the *Employer* may request a detailed breakdown of the cost for the relevant activities (all relevant comp events). The *Employer* then requires a detailed breakdown of the cost for the relevant activity based on the Price List.

Part 3: Scope of Work

Document reference	Title	No of pages
	This cover page	1
C3.1	<i>Employer's Works Information</i>	129
C3.2	<i>Contractor's Works Information</i>	1
	Total number of pages	131

C3.1: *EMPLOYER'S WORKS INFORMATION*

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1 Description of the works

The works are the design, procurement, manufacture, transportation, delivery, removal of old system, installation of new system, testing, training, and commissioning of the Seismic Monitoring & Instrumentation System (KIS) on Unit 1 at Koeberg Nuclear Power Station.

1.1 Background

1.1.1 Overview

The function of the KIS seismic monitoring system is to provide information to the operators during and after an earthquake so that a decision can be made as far as immediate and future operation of the plant is concerned.

In particular, the KIS system indicates the earthquake g level and all the information for later analysis of the behaviour of the structures and equipment.

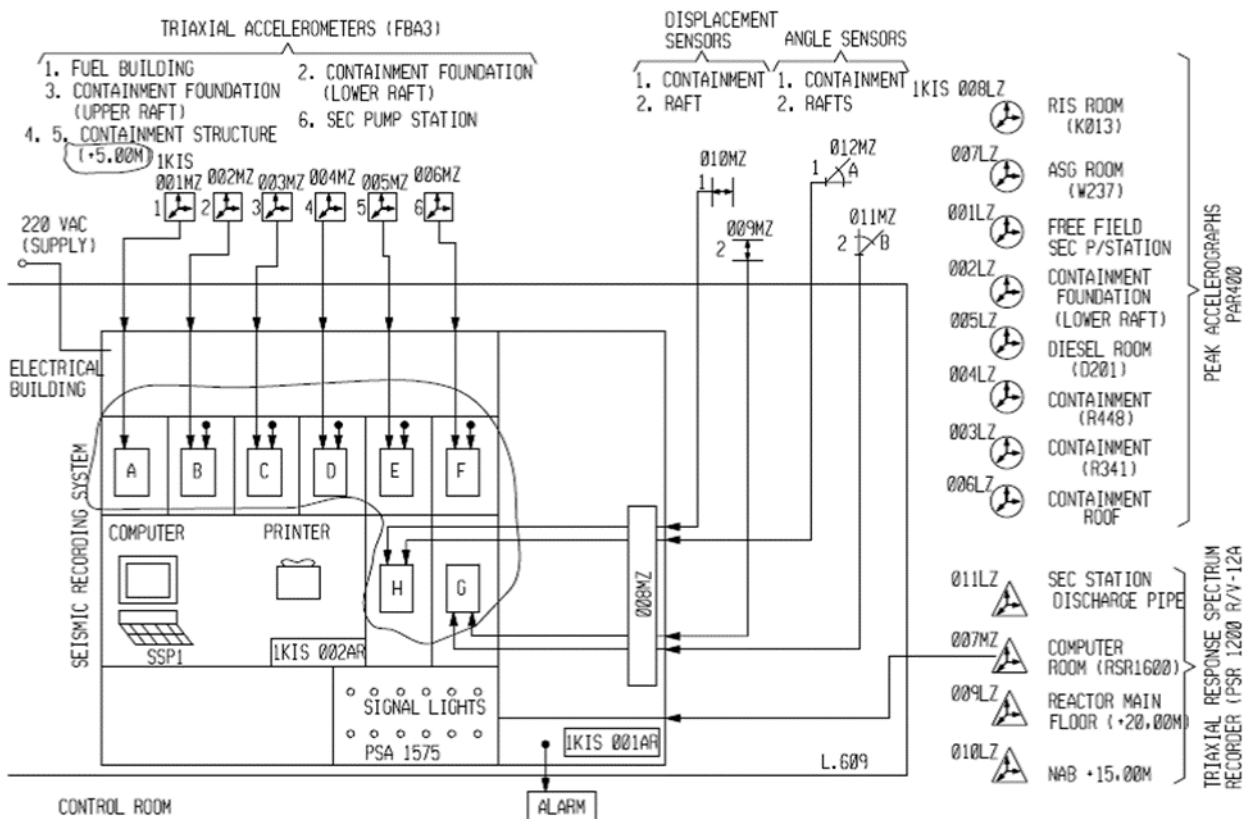


Figure 1-1: Existing KIS System Layout

The KIS system monitors selected points on site structures and equipment to determine the magnitude of a seismic disturbance. In the event of a seismic disturbance, the system records the absolute accelerations that are experienced, for later analysis of the behaviour of the structures and equipment. The recorded information is used to decide on the immediate and future operation of the plant.

During normal plant operation the KIS system is in a quiescent state. When a pre-set acceleration value is detected, demonstrative of an earthquake in progress, an alarm is sounded in the Unit 1 control room and the solid-state electronic system is automatically triggered. A passive (mechanical) system records peak acceleration.

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1.1.3 Centralised Recording Cabinets (1 KIS 001 / 002 AR)

This system analyses the data acquired from the sensors (excludes the mechanical passive peak accelerometers and the response spectrum recorders) and displays all results on a single monitor.

It displays, transmits, or receives the following information:

- Displaying and transmitting of an alarm to the control room indicating a seismic event or system malfunction.
- Recording, analysis and displaying of the time history accelerometers (x6) against the design base spectrum of each measured point.
- Recording and displaying of the linear and angle sensors. This recording must then be manually interpreted to length (mm) or degrees.

1.1.4 Summary of Different Sensors

- **PAR 400:** The PAR 400 (1 KIS 001 LZ to 008 LZ) is a passive unit where permanent records are scribed by diamond styli on replaceable metal plates. The plates lie in the horizontal (North-South), transverse (East-West) and vertical axes. Information scribed on the plates is analysed the *Employer* after the event to determine the magnitude of the event.

Equivalency I004/18E was performed by *Employer* to address the obsolescence issue identified on the originally installed ENGDAHL PAR 400 peak acceleration recorder sensors. The equivalent sensor is the PRA-103, which applies a peak acceleration record by erasing pre-recorded lines on magnetic tape clips. The lines are erased by non-contact permanent stylus.

- **PSR 1200 H/V:** The PSR 1200 H/V peak shock recorder (1 KIS 009, 010 and 011 LZ) is also a passive device requiring no power supply. Twelve reeds, per axis, of different lengths and weights, one for each frequency, are made from spring steel. A diamond tipped stylus is attached to the free end of each reed to inscribe a permanent record of its deflection on one of twelve record plates. A calibration sheet for each recorder lists the resonant frequency and g-sensitivity of each reed. This sensor comprises of three axes, similar to the PAR 400.
 - **RSR 1600 H/V - A:** The RSR 1600 (1 KIS 007 MZ) works on the same principle as the PSR 1200 but has 16 separate channels, per axis, each tuned to a different frequency. Acceleration g forces are recorded on scratch plates. The plates are physically much smaller than those of the PSR 1200. An additional feature is that miniature contacts are fitted on each channel of the RSR 1600 such that if pre-set acceleration limits are exceeded, these contacts make and latch an indication lamp on a remote annunciator unit (PSA 1575). The annunciator is in the cabinet 1 KIS 001 AR.
 - **FBA-3:** The FBA-3 (1 KIS 001 MZ to 006 MZ) is a triaxial force balance accelerometer which measures g force in three separate planes. Horizontal, Vertical and Transverse. The device works on a variable capacitance plate principle where movement of the capacitance plates relates to g force. The device has a +/- 2,5 V output which is equivalent to +/- 1g. The resonant frequency of the circuit is 50 Hz. The output of the FBA-3 feeds an SSA-3 module in the cabinet 1 KIS 001 AR. The SSA-3 module digitises the incoming signals before passing them on to the computer for analysis.
 - **Linear Displacement and Angular Position Sensors:** These devices provide information on the possible displacement of the upper raft versus the lower raft. Two linear (1 KIS 009 MZ and 010 MZ) and two angular (1 KIS 011 MZ and 012 MZ) sensors deliver continuous measurements to corresponding signal conditioners (1 KIS 008 MZ). The signal conditioners convert the sensor signals into a compatible signal to be recorded on the SSA-3 recorders which are the same as the ones used for the FBA-3's.
- Equivalency I022/08E was performed to address the obsolescence issue identified on the originally installed PENNY AND GILES linear displacement sensors (1 KIS 009 MZ and 010 MZ).

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1.1.5 Modifications

The table below show past modification on the system by the *Employer*.

MOD No.	Title and description	YEAR
88129	Relocation of seismic sensor 1 KIS 007 MZ in room L709 to gain greater access to the room.	1989
91016	Replacement of the SMA-3 seismic detection system with the SSA-3 detection system due to obsolescence and operability.	1995
93066	Relocation of PAR 400 seismic sensors 1 KIS 003 and 004 LZ off the RCP pipe and motor stand to the floor.	1996
94023	Relocation of PAR 400 seismic sensors 1 KIS 007 and 008 LZ off the ASG/RIS pipes to the floor.	1996
98003	Relocation of FBA-3 seismic sensors 1 KIS 001 MZ (from MAB basement to fuel building pool), 004 MZ (from Unit 2 upper raft to Unit 1 R341) and 006 MZ (from +2,5m to basement of SEC pump house room 021).	2001
03007	Relocation of FBA-3 seismic sensor 1 KIS 006 MZ (to room 121 in SEC pump house) and PAR 400 sensor 1 KIS 001 LZ (from MAB basement to room 121).	2003

Table 1-1 : Modifications Completed

1.1.6 Equivalencies

The table below show past equivalencies on the system by the *Employer*.

Equivalency / Safety Screening No.	Title and description	YEAR
I022/08E S2008-0289	Linear Displacement Sensor Equivalency evaluation between Penny and Giles Linear Displacement Sensor HLP 350 and proposed replacement Penny And Giles Linear Displacement Sensor SLS 320.	2008
I004/18E S2018-0127	Peak Acceleration Recorder Equivalency evaluation between ENGDAHL PAR 400 Peak Acceleration Recorder and proposed replacement TRANSPEAK PRA 103 Peak Acceleration Recorder.	2018

Table 1-2 Equivalencies Completed

1.2 Problems with Existing Design

Obsolescence is the main driving force behind the upgrade of the KIS system. Support from the OEM of the solid-state electronic system is also not guaranteed as the system has exceeded its end-of-life. The OEM for the passive system has discontinued service/running business. Life of Plant Plan (LOPP) earmarked a replacement of the system in 2010. The current system was installed in 1995.

1.3 Project Timeline

The *Employer's* preference is to implement the works in outage 127 should the current outage dates move to January 2025.

Should outage 127 not be practical, the *Contractor* shall plan to implement the works in Outage 128, which may take place in 2026 and, shall take into consideration the Operating Technical Specifications (OTS) and Limiting Conditioning of Operations (LCO) requirements.

In light of the above the *Contractor* must make provision for the validity of the warranty period of the goods and services equal to a period of 36-months from date of installation of the goods or performance of the services.

1.4 Executive overview

Obsolescence is the main driving force behind the need to upgrade the KIS system. Support from the Original Equipment Manufacturer (OEM) of the active electronic system is also not guaranteed as the system has exceeded its end-of-life. The OEM for the passive system, Engdahl Enterprises, has discontinued service/running business. The current system was installed in 1995. The Life of Plant Plan (LOPP) originally earmarked a replacement of the system in 2010.

1.5 *Employer's* objectives and purpose of the works

1.5.1 Objectives

The primary objective of the project is the replacement of the existing seismic monitoring & instrumentation system (KIS) at Koeberg Nuclear Power Station (KNPS). The scope of modification 07072 is the replacement of the solid-state electronic system, triaxial accelerometers, obsolete angular sensors and obsolete response spectrum recorder instruments with associated alarm panel, and the installation of an additional sensor at the Cask Storage Building (CSB).

It comprises of the following:

- A detailed design document according to 331-86 [21] populated in the latest detailed design template available from Design Engineering,
- Supply of material,
- Manufacturing,
- Delivery to Koeberg Nuclear Power Station,
- Removal of existing equipment,
- Installation of new equipment,
- Testing and commissioning of the modified system or equipment,
- Interfacing requirements i.e., design, configuration, and installation of the KIS system ready for KIT interfacing. This includes but not limited to physical changes, cabling, hardware, programming, testing, and commissioning associated with providing such interface,
- Interfacing with KSA (control room alarms) including physical changes, cabling, hardware, configuration, testing, and commissioning associated with providing such interface,
- Interfacing with existing electrical boards,
- Disposal of existing equipment,
- Any engineering studies associated with providing the scope of works,
- All documents and document updates as required by the *Employer's* works information,
- Qualification Documentation (e.g., environmental qualification test reports and/or seismic qualification test reports, etc.),
- Provision of design basis documents. Where design basis documents are retained by the *Contractor* or others due to the propriety information and/or intellectual property, the *Contractor* shall state how the *Employer* shall have access to the information.

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- Providing support during National Nuclear Regulator (NNR) activities,
- Providing training for operating, maintenance and engineering staff.

The scope of supply does not include the following (*Employer supply*):

- If work is performed in the controlled zone, *the Employer* shall be responsible to provide rigging equipment, scaffolding and tools as available from the *Employer's* NAB tool store.
- The *Employer* shall make the plant available in accordance with the outage schedule.
- The *Employer* shall make available the plant for inspection walk downs in a suitable outage preceding the implementation outage,
- The *Employer* shall allow access to the KNPS main documentation centre for access and retrieval of the archived design base documentation for the purposes of the scope as defined in the *Employer's* works information,
- Software updates in KIT (Ovation) will be performed by the *Employer*, however, the *Contractor* shall be responsible for providing the required design documents (KIT points database forms, etc.) for the *Employer* to perform the software update on the KIT System.
- All Ovation hardware to fulfil Ovation requirements of the modification scope shall be provided by *the Employer*.

1.5.2 Purpose

Provision of technical requirements associated with the replacement of the existing seismic monitoring and instrumentation system (KIS) at Koeberg Nuclear Power Station (KNPS). The upgrade of the KIS system shall resolve the obsolescence risk of the current system which is imperative for the Long-Term Operation (LTO) of the Koeberg Nuclear Power Station.

1.6 Interpretation and terminology

1.6.1 Abbreviations

The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
ACP	Access Control Point
AR	Availability Related
CQMP	Contract Quality Management Plan
CSC	Construction Status Certificate
DCIF	Documentation Change Identification Form
DCS	Distributed Control System
DDR	Documentation drawing request
DER	Design Extension Related
DMZ	Demilitarized Zone
DoS	Denial of Service
DSE	System Description Manual (Dossier du Système Élémentaire)
ECC	Engineering and Construction Contract
EOMR	End of Manufacturing Report
ER	Equipment Reliability

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Abbreviation	Meaning given to the abbreviation
ERCR	Equipment Reliability Change Request
FAT	Factory Acceptance Testing
FFD	Fitness For Duty
GPS	Global Positioning System
HFE	Human Factor Engineering
HMI	Human Machine Interface
HP	Human Performance
HPR	Human Performance Representative
I&C	Instrumentation and control
IAEA	International Atomic Energy Agency
ISO	International Standard Organisation
ITP	Inspection and Test Plan
KIS	Seismic Monitoring & Instrumentation System
KIT	Computer and Data Processing System (Ovation)
KORC	<i>Employers Operating Review Committee</i>
KOSC	<i>Employers Operating Safety Committee</i>
KNPS	Koeberg Nuclear Power Station
LAN	Local Area Network
LOPP	Life of Plant Plan
MAC	Media Access Control
MM	Maintenance Manual
MPI	Magnetic Particle Inspection
NAB	Nuclear Auxiliary Building
NKP	National Key Point
NNR	National Nuclear Regulator
NTP	Network Time Protocol
OBE	Operating Basis Earthquake
OE	Operating Experience
OEM	Original Equipment Manufacturer
OT	Operational Technology
OTS	Operating Technical Specification
PC	Personal Computer
PDF	Portable Document Format (Adobe Acrobat)

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Abbreviation	Meaning given to the abbreviation
PIT	Plant Induction Training
PSR	Plant Safety Regulations
PTW	Permit to Work
QA	Quality Assurance
QADP	Quality Assurance Data Package
QC	Quality Control
QCP	Quality Control Plans
RP	Responsible Person
RPC	Radiation Protection Certificate
RSA	Republic of South Africa
SAT	Site Acceptance Testing
SACPCMP	South African Council for Project and Construction Management Professions
SANS	South African National Standards
SCBA	Self-Contained Breathing Apparatus
SFT	Sanction for Test
SI	International System
SR	Safety-Related
SSE	Safe Shutdown Earthquake
TCP	Transmission Control Protocol
TRS	Technical Requirement Specification

1.6.2 Terminology

The following terms are used in this Works Information:

Term	Meaning given to the term
Acceptance	The <i>Employer's</i> use of this word on the <i>Contractors</i> documentation (including drawings, procedures, schedules, and so on) means that the <i>Employer</i> has observed no deviation from the requirements of the <i>Employer's</i> works information. The <i>Employer's</i> acceptance does not relieve the <i>Contractor</i> of its obligation to adhere to all the requirements of the <i>Employer's</i> works information and all applicable laws and regulations. The <i>Employer's</i> acceptance shall not relieve the <i>Contractor</i> of any responsibility for sufficiency, accuracy, or quality of workmanship.
Accepted with Comments	Indicates that changes or clarifications are required to the document to satisfy the requirements of the <i>Employer's</i> works information or the quality expectations of the <i>Employer</i> . The <i>Contractor</i> is expected to incorporate the <i>Employer's</i> comments and resubmit the document to the <i>Employer</i> for acceptance prior to implementation unless specifically identified by the <i>Employer</i> as approved with comments, fabrication can proceed. The <i>Employer's</i> acceptance to proceed with fabrication does not relieve the

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Term	Meaning given to the term
	<i>Contractor</i> of its obligation to adhere to all the requirements of the <i>Employer's</i> works information and all applicable laws and regulations. The <i>Employer's</i> acceptance to proceed with fabrication shall not relieve the <i>Contractor</i> of any responsibility for sufficiency, accuracy, or quality of workmanship.
Action of the Project Manager or Supervisor	The actions the <i>Project Manager</i> or <i>Supervisor</i> must perform in fulfilling their express duties, under the ECC.
Confidential	The classification given to information that may be used by malicious/opposing/hostile elements to harm the objectives and functions of Eskom Holdings Limited.
<i>Contractor</i>	Service provider, consultant or supplier that has been deemed successful (via a tender process) to provide the required service.
Controlled disclosure	Controlled disclosure to external parties (either enforced by law, or discretionary).
Construction Health and Safety Agent	A competent person who acts as a representative for the <i>Contractor</i> in managing health and safety on a construction project for the <i>Contractor</i> and who has satisfied the registration criteria of the SACPCMP to perform the required functions.
Cyber Security:	<p>Cyber security is the collection of tools, policies, security concepts, security safeguards, guidelines, risk management approaches, actions, training, best practices, assurance, and technologies that can be used to protect the cyber environment and organisation and user's assets. Organisation and user's assets include connected computing devices, personnel, infrastructure, applications, services, telecommunications systems, and the totality of transmitted and/or stored information in the cyber environment. Cyber security strives to ensure the attainment and maintenance of the security properties of the organisation and user's assets against relevant security risks in the cyber environment.</p> <p>The general security objectives comprise the following:</p> <ul style="list-style-type: none"> • Availability, • Integrity, which may include authenticity and non-repudiation, • Confidentiality.
Design	The process of devising a system, component, or process to meet the <i>Employer's</i> requirements, as specified in the Works Information. It is a decision-making process, in which the basic science, mathematics and engineering sciences are applied to meet the objective for the works.
Designer	The Person/company responsible for the detailed design of the KIS that employs professionally registered personnel in terms of the Engineering Professions Act of South Africa (or equivalent in terms of the Washington Accord) appointed by the <i>Contractor</i> to perform the design activities required by the <i>Employer's</i> works information.
Design Life	Refers to 40 years since commissioning (1984-2024).
Design Life Extension	Refers to an additional 20-year operation and 10-year decommissioning beyond the Design Life (up to 2054).
<i>Employer</i>	Eskom Holdings SOC Ltd.

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Term	Meaning given to the term
Include	If "include" is followed by other, specific, words it shall not be construed as limiting the meaning of the general words preceding it, save where the word "similar" precedes the word "include".
Including	If "Including" is followed by other, specific, words shall not be construed as limiting the meaning of the general words preceding it, save where the word "similar" precedes the word "including".
Installer	The person/company responsible for placing the KIS and associated equipment in place in accordance with all the design requirements.
Level 1 Programme	Executive summary or a project master programme. This is a major milestone type of programme which highlights major project activities, milestones, and key deliverables for the whole project.
Level 2 Programme	Management summary or summary master programme. Maintained as a summarisation of the Level 3 programme. It depicts the overall project broken down into its major components by area.
Level 3 Programme	The project coordination programme or publication programme. The Level 3 programme is maintained as an integrated rollup or summary of the Level 4 programme activities. The programme consists of a set of integrated Level 4 programmes based on Critical Path Methodology (CPM).
Level 4 Programme	Execution programme or project working level programme. Level 4 is the detailed working level programme, and an expansion a Level 3 programme. This is the key working level CPM programme displaying the operations to be accomplished. The Level 4 programme may be for major sections of the work or for discrete processes such as a design, procurement and/or a commissioning etc.
Level 5 Programme	Detail programme. This is further breakdown of the activities of a Level 4 programme. This programme is used to map out the detailed tasks needed to coordinate day to day work in specific areas.
May	Denotes permission.
Non-Outage	When the power station unit is operational
Not Accepted	Indicates that the document as submitted does not satisfy the requirements of the <i>Employer's</i> works information or the quality expectations of the <i>Employer</i> . The <i>Employer</i> shall provide a reason (not necessarily specific comments) for not accepting the document. If the <i>Employer</i> requires the document, the document shall be revised and resubmitted for acceptance. The document cannot be used for fabrication until it has been dispositioned by the <i>Employer</i> as accepted or accepted with comments.
Others	Others working on this project as required by the <i>Employer</i> are as follows: <ul style="list-style-type: none"> • NNR. • <i>Employer's</i> Authorise Inspection Agency. • <i>Employer's</i> consultants. • Consultants. <p>The list is updated, by the <i>Project Manager</i>, each time a third parties' contract is placed by the <i>Employer</i> or Others change.</p>

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Term	Meaning given to the term
Outage	When the power station unit is shut down for maintenance and refuelling.
Physical conditions	Referred under Core Clause 60.1(12) means natural physical conditions and man-made and other physical obstructions and pollutants, which the <i>Contractor</i> encounters at the Site when executing the works, e.g., sub-surface, hydro-logical conditions, etc., but excluding weather conditions.
Requirement	A condition or capability needed by a user to solve a problem or achieve an objective.
Rules of Credit for progress measurement	AACE International Recommended Practice No. 38R-06 DOCUMENTING THE SCHEDULE BASIS TCM Framework: 7.2 – Schedule Planning and Development
Scope of Supply	The sum of the products, services, and results to be provided as a project.
Shall	Denotes a requirement.
Should	Denotes a recommendation.
Site Work Package	A Site Work Package is a group of related tasks within a project. Because they look like projects themselves, they are often thought of as sub-projects within a larger project. Work packages are the smallest unit of work that a project can be broken down to when creating your Work Breakdown Structure (WBS).
Technical Lead	The provision of technical guidance, technical coordination, and technical leadership to the project, to ensure the works is suited for its designated purpose as stated in the Works Information.
Trigramme	KNPS labelling system that consists of a unit number followed by three alphabetic characters identifying a system, followed by a three-digit number, followed by two letters (bigramme) indicating a component.
Verification of Defined Cost	The substantiation of, and assessment of contractual entitlement to, reimbursement of the costs within the <i>Contractors'</i> applications for payment of Defined Cost.
Work Plan	A work plan is a project management plan by another name. It clearly articulates and outlines the steps needed to achieve a department-level or company-level end goal by setting milestones, deliverables, resources, budgetary requirements, and a timeline to weave it all together.

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1.6.3 Detailed description of the works

Deliverable	Activity	Contractor	Project Manager / Employer	In terms of
Interface and Engineering study	Design requirements for interface	Study, compilation	Review, accept.	C3.1 ECC3 EMPLOYER'S WORKS INFORMATION, SECTION: <ul style="list-style-type: none"> • 1.5.1 • 1.5.2 • 3.3
Scheme design	The <i>Contractor's</i> scheme design is sufficiently detailed to address the elements identified in the <i>Employer's</i> review report.	Compilation	Review, accept.	C3.1 ECC3 EMPLOYER'S WORKS INFORMATION, SECTION: <ul style="list-style-type: none"> • 2.3 • 3.3 KFU-026
Installation detailed design	The <i>Contractor's</i> installation design addresses the remaining requirements relating to Parts B, C and D of the <i>Employer's</i> design template and ensures that all requirements of the scheme design are met.	Compilation	Review, accept.	C3.1 ECC3 EMPLOYER'S WORKS INFORMATION, SECTION: <ul style="list-style-type: none"> • 2.3 • 3.3 • 5.5 KAA-614 KFU-026
Work Plan	The <i>Contractor's</i> Work plan addresses all requirements needed for implementation.	Compilation	Review, accept.	KFA-002
Resolution of regulator review comments	Providing support for regulatory approval per section	Compilation, support	Review, respond to comments.	KAA-501 rev 12.
Supply of material and qualification documents	The <i>Contractor</i> procures, manufactures, supplies, transports, and delivers all plant and material, including qualification test reports to Koeberg Nuclear Power Station	Compilation	Review, accept.	C3.1 ECC3 EMPLOYER'S WORKS INFORMATION, SECTION: <ul style="list-style-type: none"> • 3.3 ICOTERM DDP KAA-733 rev 6 KAA-641 rev 6.

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Deliverable	Activity	Contractor	Project Manager / Employer	In terms of
Unit 1 implementation, commissioning, and waste removal.	Construction (remove and install) and Testing.	Compilation, the works.	Review, accept.	C3.1 ECC3 EMPLOYER'S WORKS INFORMATION, SECTION: <ul style="list-style-type: none"> • 2.3 • 3.3 • 5.5 KAE-012
Cask Storage Building installation of new time history triaxial accelerometer	Construction (install new) and Testing.	Compilation, the works.	Review, accept.	C3.1 ECC3 EMPLOYER'S WORKS INFORMATION, SECTION: <ul style="list-style-type: none"> • 3.3.4 KAE-012
Training	Training to maintain and operate.	Training	Review, accept.	C3.1 ECC3 EMPLOYER'S WORKS INFORMATION, SECTION: <ul style="list-style-type: none"> • 2.15
Documentation	<i>Contractor</i> update and compiles documentation needed for scope.	Update, compile	Review, accept.	C3.1 ECC3 EMPLOYER'S WORKS INFORMATION, SECTION: <ul style="list-style-type: none"> • 2.3
Any other items/ activities necessary to perform the works.	<i>Contractor</i> to review the <i>Employer's</i> works information documents.	Review, advise.	Accept	C3.1 ECC3 EMPLOYER'S WORKS INFORMATION

2 Management and start up.

2.1 Process

All modifications performed at KOU are controlled in accordance with the *Employer's* procedure KAA-501 Revision 12. For the purposes of this contract, the following sections are applicable to providing the Works:

- Section F - Execution Detail Development
- Section G - Authorisation to Implement
- Section H - Schedule of Work
- Section I - Implementation
- Section J - Finalisation

2.2 Management meetings

Regular meetings of a general nature may be convened and chaired by the Project Manager as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
<ul style="list-style-type: none"> • Project kick-off meeting 			
1. Establishing the project team Note: The <i>Project Manager</i> notifies the names of <i>Employer</i> key persons to support the <i>Contractor</i> with the Provision of the Works, in terms of the <i>Employer</i> functions.	Once-off (Within 1 week after the Contract Date)	KOU	<i>Project Manager</i> , Employer key personal At kick-off meeting with <i>Employer's</i> Org structure.
2. Notification, venue, agenda, and support documentation. Note: The <i>Project Manager</i> develops and notifies the agenda, venue and required support documentation for the meeting.	Once-off (Within 2 weeks after the Contract Date)	KOU	An <i>Employer</i> systems engineer, operations representative and maintenance representative is present at the meeting.
3. Execution and Minutes Note: The Project Manager assumes chairmanship of the meeting, records, and distributes the minutes of meeting.	Once-off (Within 4 weeks after the Contract Date)	KOU	<i>Project Manager</i> , <i>Employer</i> , <i>Contractor</i> , <i>Supervisor</i> , and Others as required.
4. Conclusion Note: This activity is complete upon acceptance of the minutes of the kick-off meeting by both Parties. Deliverable: Minutes of the kick-off meeting.	Once-off (In accordance with the Accepted Programme)	KOU	<i>Project Manager</i>
<ul style="list-style-type: none"> • Risk registers and compensation events At the risk reduction meetings items as prescribed in ECC Core Clauses 16.2 and 16.3 are discussed. The Risk Register is 	Ad hoc	KOU	<i>Project Manager</i> , <i>Employer</i> , <i>Contractor</i> , <i>Supervisor</i> , and Others as required.

THE REPLACEMENT OF THE SEISMIC MONITORING AND INSTRUMENTATION SYSTEM AT KOEBERG NUCLEAR POWER STATION UNIT 1

Title and purpose	Approximate time & interval	Location	Attendance by:
updated, by the <i>Project Manager</i> , and distributed within five days of the meeting.			
<ul style="list-style-type: none"> • Operational meetings An operational meeting is held, by tele- or video conference, if necessary, between the <i>Project Manager</i> and the <i>Contractor's</i> project manager to monitor and control the design, manufacturing and planning processes. Typical topics for discussion at this meeting shall include <i>Contractor's</i> reporting on the following: <ul style="list-style-type: none"> • Review of Project Progress (Programme) with specific focus on Key Dates and interim milestones. • Key Risks (threats) and Issues and, where applicable, identify and agree on associated preventive/contingent and recovery actions. • Review of Actions List. • Review of Communications. 	Monthly	KOU or Tele/Video Conference	<i>Project Manager, Contractor, Supervisor</i>

<p>Implementation meeting for specific progress and feedback</p> <p>The implementation meeting is held between the <i>Contractor</i> and <i>Supervisor's</i> implementation support team, to report on implementation progress and review any risks, issues and <i>Employer</i> actions that need to be resolved to ensure smooth implementation of the <i>works</i>.</p>	Daily during implementation	KOU	<i>Contractor</i> and <i>Supervisor</i>
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<ul style="list-style-type: none"> • QC Meetings during implementation The <i>Contractor's</i> QC representatives provide reports from each meeting to the <i>Employer's</i> project QC Group. This report shall cover: <ul style="list-style-type: none"> • Scheduled QC inspections for the period identified in the meeting. • Any new QC related issues identified since the last report, its status and action plan for resolution. • Status and progress on previously reported quality issues. 	Daily during implementation	KOU	<i>Contractor</i> QC representative and <i>Employer</i> QC representatives
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Title and purpose	Approximate time & interval	Location	Attendance by:
<ul style="list-style-type: none"> Meetings of a specialist nature Meetings of a specialist nature may be convened by persons and at times and locations to suit the Parties, the nature, and the progress of the works. 	Ad hoc	Any	<i>Employer's personnel, the Project Manager, the Contractor, the Supervisor, and Others as required</i>
<ul style="list-style-type: none"> “Table Top” meetings To manage the occupancy of the Working Areas during implementation, the <i>Contractor</i> attends the “Table Top” meetings with the <i>Employer's</i> Outage representative to discuss area workload and to integrate and schedule the <i>Contractor's</i> activities as such as to allow sufficient space for implementation. 	AD hoc	KOU	<i>Employer's personnel, the Project Manager, the Contractor, the Supervisor, and Others as required</i>
<ul style="list-style-type: none"> Post implementation meeting for project feedback and review The post implementation meeting is held between the <i>Project Manager, Contractor</i> senior management, <i>Supervisor</i>, Outage control centre management and other line groups, to report on implementation issues and reviews. Share lessons learnt to ensure smooth implementation on the next implementation phase. 	Post unit implementation	KOU	<i>Project Manager, Contractor Senior Manager (not the Contractor's Project Manager), Contractor's Project Manager, Supervisor, Employer's personnel, Others as required</i>

Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature, and the progress of the works.

All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Records of these meetings shall be submitted to the *Project Manager* by the person convening the meeting within five days of the meeting.

Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions. Confirmation of contract communications during operational meetings shall, however, be considered as formal acknowledgement of receipt of a contract communication.

2.3 Documentation control

2.3.1 Documentation and record management

- All documentation produced by the *Contractor* complies with the latest *Employer's* guide for technical writing - GGG-1299 Rev 0 [53] with date formats in accordance with ISO-8601 [58] extended date format and measurements in metric units.
- The KNPS Modification Process shall be adhered to. All drawings and documents shall be supplied to the *Employer* in pdf and in their native formats as applicable.

THE REPLACEMENT OF THE SEISMIC MONITORING AND INSTRUMENTATION SYSTEM AT KOEBERG NUCLEAR POWER STATION UNIT 1

- Drawings submitted to the *Employer* by the *Contractor* shall fulfil the *Employer* standard drawing practice as per 240-86973501[13].
- All documentation, including drawings and operating and maintenance instruction manuals, are uniquely identified and cross-referenced with all related documents. Document deliverables are provided in electronic, searchable format (PDF) and includes all signatures obtained internally.
- Once the document deliverable has been accepted by the *Employer*, the *Contractor* provides, in addition to the electronic submission, one hardcopy version of the document.
- Where required, the *Contractor* may be requested to supply a document in its originally compiled format i.e., “Word”, “Excel”, “Visio” to facilitate the *Employer’s* review or documentation updates. The *Contractor* provides, upon request, the documents in its originally compiled format.
- All new drawings submitted by the *Contractor* conforms to the *Employer’s* drawing standard, KBA 0000 G00 1000 [79].
- The *Contractor* requests sequential drawing and document numbers from the *Employer* (where applicable).
- All new drawings are handed to the *Employer* in the electronic media (e.g., dgn format) which is compatible to Microstation Version 7 (or higher) software program.
- All new drawings are sized to metric paper size standards (A4, A3 etc.).
- The *Contractor* identifies and provides the update requests for affected drawings, documents, and procedures.
- The *Contractor* corrects all identified documentation / configuration anomalies required to implement the *works* and notify the *Project Manager* of any other.
- Programmes, prepared by the *Contractor*, for the *works* and accepted by the *Project Manager* are considered as records.
- Records are kept, by the *Contractor*, identifying generally the activities on the Site, labour on the Site, Equipment on the Site, Subcontractor work on the Site, delivery of material to the Site, list of any instructions given, weather conditions encountered, and any delays encountered on the Site.
- All equipment manuals shall be added to the documentation system in accordance with 331-85 [20] by the *Contractor*.
- All mark-ups of existing KNPS documents / drawings shall use the latest revision available in the KNPS documentation centre at the time of submission to the *Employer*.
- All text documentation shall be submitted by *Contractor* in Microsoft Word format as set out in approved templates.
- All tabular data shall be submitted by the *Contractor* in Microsoft Excel format.
 - One copy in CD/DVD or flash disc format.
 - Two hard copies in A4 format.
 - Drawing hard copies are printed to its designed size, i.e., an A0 drawing is printed to A0.
- The *Employer* shall provide the *Contractor* with a sequence of drawing numbers that shall be used on any new drawings.
- All symbols shall be used as specified in reference KBA 0000 G00 1000 [79].

2.3.2 Documentation to be provided by the *Employer*.

- The *Employer*, on request from the *Contractor*, shall provide copies of all applicable *Employer* standards, procedures, guides, and forms.
- The *Employer* shall provide access to all available Site documentation required for Providing the Works.
- Original component related design base information does not all reside with the *Employer*. In cases where such information is required and not available, the *Contractor* reverse engineers the basis as part of the *works*.

THE REPLACEMENT OF THE SEISMIC MONITORING AND INSTRUMENTATION SYSTEM AT KOEBERG NUCLEAR POWER STATION UNIT 1

- The *Contractor* shall provide a list of persons that require authorisation, by the *Project Manager*, for requesting copies of Site documentation.
- The *Project Manager* only authorises the relevant personnel once the *Contractor* has signed the Confidentiality and Non-Disclosure Agreement.
- Copy requests shall be in writing, to the *Project Manager*, which details the exact documentation identification numbers.
- Documentation shall be in accordance with the latest Accepted Programme.

2.3.3 Detailed Final Design

- The *Contractor* shall provide the *Employer* with a detailed design document according to the requirements of 331-86 [21] that includes all information relating to the design, supply, installation, testing and commissioning of the modified system as required in this specification.
- It is the *Employer's* preference to concur with the scheme design (Part A) before work commences on the installation and procurement specifications (Parts B and C). This is done to ensure agreement is reached, between the *Contractor* and the *Employer* and other stakeholders, on important technical design and manufacturing aspects and to facilitate approval of the final and complete deliverable.
- The *Contractor's* Detailed Design shall contain all the requirements as stated in the *Employer's* Detailed Design review report 331-433 (KFU-026) [31]. The *Contractor* shall complete and submit to the *Employer* the KFU-026 form.
- The detailed design shall be presented to the *Employer's* Design Engineering (DE) Group at KNPS. The *Employer* shall review all design and technical documents completed by the *Contractor* for acceptance and thus also reserves the right to forward any such documents to third party reviewers as part of the *Employer's* internal procedures.
- For the modification, as described in the *Employer's* works information, an Equipment Reliability (ER) Preventative Maintenance (PM) strategy input sheet QFR-026 [130] shall be populated by the *Contractor* in accordance with the *Employer* Integrated Equipment Reliability Process KAA-913 [78]. The *Employer* shall use the populated QFR-026 [130] form to initiate an ER change request in accordance with KAA-913 [78].
- The final design and design documents shall be issued for review by the *Employer*. Only after all review comments have been successfully resolved and the document updated shall the document be accepted and signed by the *Employer*.
- The *Contractor* will be informed by the Employer when the final design is accepted by the Employer and the NNR.
- Manufacturing may only proceed after acceptance of the relevant design documents.

2.3.4 Calculations, Reports, Models, Drawings, etc.

- The *Employer* shall have complete and unrestricted ownership right to all calculations, technical reports, models, drawings, design documents, (except computer codes that constitute a pre-existing program or method and are designated as proprietary to the *Contractor*), procedures and other written information developed solely for the *Employer* by the *Contractor* during its performance under the contract.
- The *Contractor* shall provide a complete set of post manufacturing "as built" drawings as part of the Quality Assurance Data Package (QADP).
 - The *Contractor* shall ensure that creation, issuing and control of drawings are in accordance with the *Employer's* Engineering Drawing Standard (240-86973501) [13].
 - The *Contractor* shall ensure that all drawings have drawing numbers issued by the *Employer* prior to submission.
 - All symbols shall be used as specified in the KNPS document KBA 0000 G00 1000 (Koeberg Standard Graphic Symbols) [79].

THE REPLACEMENT OF THE SEISMIC MONITORING AND INSTRUMENTATION SYSTEM AT KOEBERG NUCLEAR POWER STATION UNIT 1

- Drawings shall be CAD-generated, compatible with Bentley Microstation and are submitted to the *Employer* in (.dgn) format. Drawings issued to the *Employer* in native format are not “Right Protected” or encrypted.
- The electronic copies shall be approved and signed by professionally registered Engineer in terms of the Engineering Professions Act no.46 of 2000, including the Engineer’s Professional Engineering Number, signature, and date when the drawing was signed.
- The *Contractor’s* drawings are complete in every respect and are checked by the *Contractor* prior to submission to the *Project Manager* for acceptance.
- Each drawing set shall have an overview drawing which shows the overall layout of the system relevant to the drawing, with references to drawings where the details of the components depicted in the overview drawing can be found.
- A design drawing package shall be issued with one drawing number and multiple sheets, instead of multiple drawing numbers. The breakdown of the drawing packaging is sent to the *Project Manager* for acceptance.
- Drawings containing references to interfacing systems and to other applicable/relevant drawings shall include the *Employer’s* drawing number as well.
- The reference drawing list shall include the *Employer’s* drawing number. The *Employer’s* drawing number shall be referenced in all communications and documentation.
- Drawings shall contain parts lists of all the components depicted in the drawing set. These parts lists include at minimum the following information:
 - (a) Number label of the part in accordance with the numbering convention indicated on the drawing,
 - (b) Description of the part,
 - (c) Description of the profile of the part (if it is not a standard profile, the dimensions are provided),
 - (d) Length of the part,
 - (e) Quantity of the part,
 - (f) Material specification and reference to the relevant material standard/code for the part.
- All connection details shall be indicated on drawings.
- All dimensions of structural mechanical equipment and associated structures shall be provided. No dimensions shall be obtained from a drawing by scaling.
- Tolerances for the design shall be clearly indicated on the drawings.
- Electronic drawings shall have a water mark indicating the approval phase of a drawing and hardcopies shall be stamped to indicate the phase, i.e., preliminary, issued for review, issued for construction, etc.
- The final detailed engineering drawings that are issued for construction shall be on revision 0. Drawings submitted prior to that, have revisions of 0.1, 0.2 or a, b, c etc.
- All cells in the drawing title block needs to be populated and completed before the drawing is signed off.

2.3.5 Operating and Maintenance Manual Requirements

- Installation, operation, and maintenance updates (mark-ups) contained in a maintenance manual and other relevant documents shall be submitted to the Employer as part of the detailed design.
- The *Contractor* shall provide *the Employer* with a detailed maintenance basis with maintenance baselines, procedures, and manuals applicable to the long-term operation of the KIS System.
- The maintenance manual shall include spares lists and maintenance programs.

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2.3.6 Documentation to be handed over to the Employer.

- Documentation to be submitted to the *Employer* prior to system handover shall include but is not limited to:
 - KIS system Operational Documentation requirements:
 - (a) Operational and monitoring Procedure.
 - (b) Emergency Operating Procedure
 - (c) Interpretation of alarms and fault-finding procedure
 - (d) Re-commissioning Procedures that shall include crucial test values for acceptable equipment operation.
 - KIS system Maintenance and Engineering Documentation requirements to be included in the KNPS DSE and a Maintenance Manual:
 - (a) Overall system design, layout drawings and installation information
 - (b) Codes and standards relevant to the various equipment
 - (c) Module circuit diagrams
 - (d) Software manuals
 - (e) Power supply requirements
 - (f) Seismic test reports
 - (g) Environmental requirements
 - (h) Performance characteristics and specifications
 - (i) Routine Inspection Specification
 - (j) Service Interval Specification
 - (k) Bill of Material, Material Number and Supplier
 - (l) Overhaul Procedures and Specifications
 - (m) Test Procedures and Specifications
 - (n) Serial Numbers of Items installed.
 - (o) Recommended Spares List
 - (p) Drawings Applicable to Plant
 - (q) Certificate of compliance in terms of SANS 10142-1 [136] for 1 KIS in terms of NSIP03111 and OHS Act [124].
 - The *Contractor* shall identify all required and affected KNPS documentation and request such documentation from the *Employer*. The *Employer* does not guarantee that all requested documentation is available or can be provided.
 - Engineering and Implementation Execution Strategy

2.3.7 Communication

All communication by the *Contractor* shall be addressed to the *Project Manager* or the *Supervisor*, as applicable to the ECC. All communication shall refer to:

- the contract number that is issued by the *Employer* (normally a 46000xxxxx number),
- the title of the contract,
- any previous references relating to the specific communiqué (i.e., a response to a *Project Manager's* communication),
- the specific ECC clause under which the communication is issued,
- whether a reply is required; and
- a unique letter reference number.

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The unique reference number to be used for written correspondence between the *Project Manager* and *Contractor* and vice versa is as follows:

- From the *Project Manager* to the *Contractor*: 46000..... Z/E/C 0xxx
- From the *Contractor* to the *Project Manager*: 46000..... Z/C/E 0xxx

with Z referring to the following categories:

- Z = C for letters associated with ECC clause 5, 6 or 9
- Z = R for letters not associated with ECC clause 5, 6 or 9

and xxx referring to the next sequential letter number.

All document deliverables transmitted to the *Project Manager* for review / acceptance / record / information are transmitted under formal communication with an associated document transmittal cover document. Related CDs or hardcopy documents are delivered with a hardcopy copy of the formal communication and/or document transmittal to the *Employer's* nominated information controller – situated on Site.

The title of each letter clearly summarises the purpose of the letter. In accordance with ECC Core Clause 13.7, each notification deals with only one specific issue at a time.

Where written and/or signed communication is required in terms of this Contract, the terms “writing” and “signed” or their analogous forms, shall be construed as excluding sections 12 and 13 of the Electronic Communication and Transaction Act 25 of 2002, save that such a communication may be scanned after manual signature and then sent electronically.

In the case where letters are submitted electronically by means of email, the title of the letter is reflected in the subject line and only one letter is submitted per email.

2.4 Health and safety risk management

2.4.1 Contractor's responsibility under the OHSACT, 85 of 1993

The *Contractor*:

- Complies with legislation in providing the *works*.
- Ensures the Site and work processes under their control do not endanger health and safety.
- Ensures Plant and Material and Equipment comply with legislation.
- Ensures Plant and Material and Equipment supplied are safe when used according to manufacturer specifications (includes leased Equipment).
- Maintains Equipment in safe condition.
- Provides notice when Plant and Material or Equipment does not comply with legislation.
- Cooperates with any person exercising duty under legislation.
- Ensures assistance is provided to a person, exercising duty under legislation, to meet an obligation under legislation achieves that objective.
- Ensures the *works* is provided by a competent supervision and workers; and
- Ensure the *works* does not create a hazard to the *Employer* and Others on the Site.

2.4.2 Nuclear Safety

The *Contractor* promotes a culture that is dedicated to continuously striving to enhance nuclear safety.

The *Employer* defines appropriate safety objectives for the NOU, and the *Contractor* is also responsible for meeting those objectives, instilling a philosophy of personal excellence, and timely identification and resolution of safety problems.

The *Contractor* is responsible for continuously pursuing enhancements to safety-not just complying with a minimal set of legal requirements.

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2.4.3 SHE Specification

The *Contractor* complies with the *Employer's* Level 2 Construction Safety, Health and Environment Procedure, number 32-136 [18]. SHE specification guidelines to which *Contractor* complies with are supplied by the *Employer*.

A project specific SHE file is to be created by the *Contractor* and submitted together with a completed copy of the Construction Regulations Checklist to the *Supervisor* for acceptance within 2 months of the *starting date* following which the *Contractor* maintains and updates the file.

It is to be noted that before any work can commence on Site, the *Contractor* must have performed a detailed risk assessment of the work to be performed and/or the work area where work is to be performed. The risk assessment is documented and discussed with the parties involved with the work and is to be submitted to the *Supervisor* for acceptance.

Personnel protective clothing as specified in the Act for all work, except work in the radiological controlled zone, is provided and is kept in good order by the *Contractor*. A hard hat (with chin strap), safety boots, ear plugs, and safety glasses are mandatory safety equipment at the Site. Where work is to be performed on the 7,5m level Electrical Building, the *Contractor* provides arc-flash suits. Protective clothing for work in the controlled zone is prescribed and is supplied by the *Employer*.

2.4.4 Incident Management

The *Employer's* procedure 32-95 - Environmental, Occupational Health and Safety Incident Management Procedure [17], states the requirements for the effective management of incidents that may occur or could result in, occupational diseases/illnesses, fatalities, injuries, near misses, and/or environmental damage.

2.4.4.1 Reporting of SHE incidents:

All incidents occurring on site while Providing the Works shall be reported, to *Supervisor*, as soon as practicable but not later than the end of that shift (in terms of KAA-688) [69] and in the event of an incident as defined in terms of Section 24 of the OHSACT, 85 of 1993 [124] where someone dies, becomes unconscious, suffers the loss of a limb or part of a limb is also reported immediately to the Department of Labour by the *Contractor*.

The following are requirement for the *Contractor*, in terms of KAA – 688 -The Corrective Action Process):

- In the event of any incident or accident, a flash report is completed by the *Contractor* and submitted before end of shift or within 24hrs to the *Employer* and the *Supervisor*.
- The *Employer's* template for the flash report is included in the *Contractor's* health and safety plan.
- The *Supervisor* raises a Problem Notification (PN) and capture the details on the Electronic Problem Management System (EPMS).
- Where applicable, the *Supervisor* shall mobilise an incident investigation team who shall investigate the incident within 7 days, complete the *Employer's* corporate documentation, indicating the root causes, corrective actions, and recommendations for submission to the *Employer's* OH&S Department.
- The *Contractor* must submit proof of corrective action within pre-determined due dates to the *Employer's* OH&S Department, who shall then close-out the Problem Notification (PN) on the Electronic Problem Management System (EPMS). Dependant on the incident. it may also be required that the *Contractor* presents the corrective action to the *Employer's* operating safety committee (KOSC).

2.4.4.2 Investigation and recording of incidents:

All incidents are investigated by the *Contractor* with the assistance of the *Supervisor*, to establish the direct, indirect and root cause of such incident as well as any reactive/preventative measures required and implemented to prevent a re-occurrence of such future incidents. Any such incident is recorded by the *Contractor* as required by General Administrative Regulation 9(1) of the OHSACT, 1993. The *Contractor* complies with the timeframes of investigating incidents as required in terms of General Administrative Regulation 9(2).

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2.4.4.3 Environmental incidents

Environmental incidents could include but is not limited to:

- Release of effluent to the environment
- Non-compliance to station water permit conditions
- Non-compliance to station sewage permit
- Non-compliance to waste site permits
- Illegal dumping of waste
- Environmental Impact Assessments (EIA) not undertaken for projects.
- Non-compliance to EIA Record of Decision (ROD)
- Cutting down of protected plant species
- Harming of protected animal species

The *Supervisor* shall inquire into all incidents including near-misses during contractor audits.

2.4.5 Health and safety plan

The *Contractor's* health and safety plan is the *Contractor's* proposal of how the work shall be carried out considering the hazards expected and procedures.

The *Project Manager* reviews and accepts the health and safety plan according to EPC 32-136. The construction regulation checklist with the required information must be included in the health and safety plan.

The *Contractor* ensures that contents of the health and safety plan for the project shall include at least:

- A copy of the principal contractor appointment letter.
- The scope of works /description of the work for which the *Contractor* was appointed.
- The *Contractor's* risk assessment including control/mitigation measures to address all the risks identified.
- The risk based legislative appointments made, by the *Contractor*, as required by the construction regulations.
- The risk based legislative checklists and registers to be completed, by the *Contractor*, as required by the construction regulations.
- Certified copies and proof of competencies of all *Contractor* appointees i.e., training certificates, permits, medical certificate of fitness and curriculum vitae where required.
- Copies of identity documents for *Contractor's* employees / workers appointed for the *works*.
- Accident/incident registers to be kept, by the *Contractor*, in the event of any incidents, including near misses. A copy of the *Employer's* flash report template is included in the *Contractor's* health and safety plan, should it be required in the event of an incident.
- Any waste management and pollution prevention by the *Contractor* – where required permits for dumping/incineration at authorised facilities. The *Contractor* must consult and comply with the *Employer's* applicable waste procedure KAE 012.
- Proof of the *Contractor's* registration and letter of good standing with COID or other registered insurer, Construction Industry Development Board (CIDB) and/ or Electrical Contractors Board.
- A SHE Programme, compiled by the *Contractor*, using the template provided in KAA-768 [75].

The *Supervisor's* letter of acceptance of the health and safety plan is added as soon as it is obtained.

The *Contractor* submits the health and safety plan, 30 days prior to commencement of any part of the *works* on Site, to the *Supervisor*, who verifies whether contents for acceptance. The *Contractor's* health and safety plan shall be returned to the *Contractor*, should it not contain the required information or where the necessary permits have expired.

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The accepted *Contractor's* health and safety plan must be on the Site. Periodic audits are conducted to ensure that the *Contractor's* health and safety plan is implemented and maintained as the project progresses. Refer Construction Regulation 4(1)(d).

When the *Contractor* is required to review and update documentation on the *Contractor's* health and safety plan, the plan must be re-submitted to the *Supervisor* for acceptance.

2.4.6 Health and safety file

The *Contractor's* health and safety file is separate from the *Contractor's* health and safety plan. The *Contractor's* health and safety file is progressively populated with checks and inspections, as indicated in the *Contractor's* health and safety plan. Any drawings, designs, materials used, structural integrity testing and any other similar information applicable to the project shall be placed on the *Contractor's* health and safety file.

The *Contractor's* health and safety file must be available on request and should be handed over to the *Supervisor*, prior to the Completion Date (Refer Construction Regulations 5(7) and 5(8)).

Depending on the nature of the *works* and detail of the information on the *Contractor's* health and safety file, e.g., asbestos work where there is a requirement for medical surveillance of workers who shall be exposed to asbestos, it is recommended that the *Contractor* keeps these records for forty years, in terms of Asbestos Regulations 16(f).

Where the *Contractor's* employees / workers are exposed to hazardous chemical substances and where a medical surveillance was required, it is recommended that the *Contractor* keeps these records for thirty years, as stipulated under the Hazardous Chemical Substances Regulations 9(f).

The *Contractor* ensures that all other medical surveillance requirements in terms of the OHS ACT, where applicable, is complied with for the *Contractor* and Sub-contractor organisations.

The *Contractor's* health and safety file is audited by the *Supervisor* or his delegate, to ensure that work is being carried out and the necessary checks and inspections are conducted in accordance with the *Contractor's* plan.

The minimum contents of a SHE File are indicated in EPC 32-136.

2.4.7 Risk assessments

The *Contractor* appoints a competent risk assessor, in writing, to perform risk assessments (Construction Regulation 7(1)). The *Contractor* is however required to use the *Employer's* methodology and provide a project specific risk assessment with the *Contractor's* health and safety plan, submitted for review and acceptance by the *Supervisor*. The *Contractor's* risk assessment includes a monitoring and review plan as required by Construction Regulation 7(1). No work may commence on Site, until the *Contractor's* risk assessment has been accepted by the *Supervisor*.

The *Contractor* ensures that ergonomic hazards have been identified evaluated and addressed, as required by Construction Regulation 7(6). Hazards the *Contractor* must consider include:

- improper lifting techniques,
- continuous repetitive movements with body parts in extreme postures; and
- poor grips on tools or carrying containers with no handles.

Whenever changes to methods of working / manufacture or materials are introduced, the *Contractor's* risk assessment is reviewed, including controls and mitigation measures, and submitted to the *Supervisor* for review and acceptance. Following acceptance, the *Contractor's* risk assessment must be placed in the health and safety plan, for implementation.

The *Employer's* risk assessment chart is completed, by the *Contractor*, during the *Contractor's* pre-job briefs and displayed at the entrances to those areas of the Site. The template is available from the *Supervisor*.

The *Contractor* ensures that all *Contractor's* employees are informed, instructed, and trained by a competent person regarding the hazards, risks, and related work procedures. These employees must carry proof of such training, for the duration of the project. (Construction Regulation 7(9)).

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With regards to environmental considerations, the *Contractor* ensures that any aspect from a product or activity that might have an impact on the air, water, marine and soil or which may have the potential to cause harm to the environment is addressed in the *Contractor's* risk assessment, to avoid any environmental incidents while Providing the Works. Where such impact cannot be avoided, the *Contractor* ensures that the necessary steps are taken to minimise and remediate such impact. (Refer to Section 28 of National Environmental Management Act, 1998).

Lists of expected hazards and risks at the KOU have been referenced in EPC 32-136, as well as the Occupational Health Services Job Specification (reference KJV-SR-004) [96], outlining the required physical attributes and personal protective safety equipment. Some known hazards include:

- **Safety:** live electrical equipment, working at heights, moving vehicles, floor openings, slippery floors, unguarded machinery, sharp tools, exposed blades, suspended loads, overhead pipelines, floor level pipelines, faulty portable electric tools, strong winds, poorly maintained high pressure vessels, untrained staff doing hot work.
- **Health:** radiation exposure, dust, noise, snake/spider bites, bee stings, chemical fumes and splashes, asbestos lagging, prolonged awkward postures.
- **Environmental:** air emissions, marine spill, ionising radiation being released into environment, chemicals leaching into ground/soil, diesel/petrol spill, clearing of vegetation, disturbance of habitat.

2.4.8 Accident - Incident Reporting Protocol

The reporting of accidents/incidents is a legal requirement as outlined in the OHSAct, section14 (e)

The *Employer's* corporate procedure 32-95 (Rev 6) [17] addresses the process that must be followed by all Parties. The following table indicates the actions required and the timeframes in which to act.

Incident	Action	Timing
Near Miss	<ul style="list-style-type: none"> • Condition Report (Devonway). • Near Miss Card • Flash Report. No investigation required unless a trend develops or priority rating is high or extreme as per Procedure: 32-95, Rev 6 [17].	Report incident before end of shift.
Property Damage	<ul style="list-style-type: none"> • Condition Report (Devonway). • Flash Report. • 240-62989893 - Vehicle Accident Reporting form [9] No investigation required unless a trend develops or rating is high or extreme as per 32-95, Rev 6 [17].	Report incident before end of shift.
First Aid	<ul style="list-style-type: none"> • Condition Report (Devonway) • Flash Report. • Minor Injury form. • 240-77046688-<i>Employers</i> Investigation Report (Complete sections: 1, 2, 6, 7, and 10) [10]. Accident/Incident investigation required as per 32-95, Rev 6 [17].	<ul style="list-style-type: none"> • Report incident before end of shift. • Investigation completed within 7 days. • Investigation report to be completed within 30 days.

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Incident	Action	Timing
Medical Injury	<ul style="list-style-type: none"> • Condition Report (Devonway). • Flash Report. • 240-77046688-<i>Employer's</i> Investigation Report (complete sections: 1, 2, 6, 7, and 10) [10]. • <i>Employers</i> Report (WCL II). • Resumption Report. • Annexure 1 <p>Note: 1st medical, progress and final medical reports to be issued by medical practitioner</p>	<ul style="list-style-type: none"> • Report incident before end of shift. • Investigation completed within 7 days. • Investigation report to be completed within 30 days.
LTI's	<ul style="list-style-type: none"> • Condition Report (Devonway). • Flash Report. • 240-77046688-<i>Employers</i> Investigation Report (full document) [10]. • <i>Employers</i> Report (WCL II). • Resumption Report. • Annexure 1 <p>Note: 1st medical, progress and final medical reports to be issued by medical practitioner</p>	<ul style="list-style-type: none"> • Report incident before end of shift. • Investigation completed within 7 days. • Investigation report to be completed within 30 days.
Fatality or Occupational Diseases	<ul style="list-style-type: none"> • Condition Report (Devonway). • Flash Report. • 240-77046688-<i>Employers</i> Investigation Report (full document) [10] . • <i>Employers</i> Report (WCL II). • Resumption Report. • Annexure 1 <p>Note: 1st medical, progress and final medical reports to be issued by medical practitioner.</p>	<ul style="list-style-type: none"> • Report incident before end of shift. • Investigation completed within 7 days. • Investigation report to be completed within 30 days.

2.4.9 Work Stoppages

The *Employer* may from time-to-time issue stop work / use instructions to address OHS incidents, danger to health and safety or concerns. This would normally include a mass briefing or information that must be shared with the *Contractor's* workers. The *Contractor* caters for such interruptions as part of the *Contractor's* risk and includes for it under the Prices.

These instructions do not include the total clearance of the Site, which shall be accompanied with an instruction from the *Project Manager* under ECC Core Clause 34.1.

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2.4.10 Employer's lifesaving rules

The *Contractor* complies with the *Employer's* five rules as stipulated in the *Employer's* Management Directive 32-421[16]. The *Employer* takes a ZERO TOLERANCE stance to violation of these rules:

- Rule 1: Open, isolate, test, earth, bond, and/or insulate before touch.
- Rule 2: Hook up at heights.
- Rule 3: Buckle up.
- Rule 4: Be sober.
- Rule 5: Permit to work.

2.5 Environmental constraints and management**2.5.1 Environmental impact**

Environmental impact filtering is performed by the *Contractor* in accordance with the following. This filtering record is included as part of the Scheme Design.

Activity Description	Project Manager	Contractor	Requirements	Planning	Additional notes
Environmental Impact Assessment Filtering Phase.		X	<ul style="list-style-type: none"> • The <i>Contractor</i> completes the Environmental Impact Assessment Filtering in accordance with National Environmental Management Act 107 of 1998 • The EIA filtering is performed as part of the Scheme Design and submitted as an attachment to the Scheme Design. 	In accordance with Accepted Programme	
Acceptance by the <i>Project Manager</i>	X		<ul style="list-style-type: none"> • The <i>Project Manager</i> obtains acceptance from the <i>Employer's</i> Environmental Officer, with support from the <i>Contractor</i>. 	Within 2 weeks of submittal.	Acceptance by the <i>Project Manager</i> is subject to acceptance by the <i>Employer's</i> Environmental Officer. This acceptance is obtained as part of the Scheme Design acceptance process.
Environmental Impact Assessment Studies (where required)		X	<ul style="list-style-type: none"> • The <i>Contractor</i> provides the necessary input data to complete any additional EIA studies required for the relevant modification. 	In accordance with Accepted Programme	
Conclusion	X	X	<ul style="list-style-type: none"> • This activity is complete upon acceptance by the <i>Project Manager</i> of the EIA filtering. 	In accordance with Accepted Programme	Deliverable: Environmental Impact Assessment Filtering form/report.

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Section 3.3.1 (Environmental Conditions) of the *Employer's* works information specifies environmental requirements to be considered in the *Contractor's* design.

2.5.2 Plant and Materials

The *Contractor* ensures that all Plant and Materials, services and work supplied in terms of this contract conform to all applicable environmental legislation and in the *Contractor's* residing country and to the *Employer's* environmental specifications. The *Contractor* ensures that the *Employer's* chemical restrictions and controls at Koeberg (CRACK) programme (KAA-751) [74] are adhered to.

2.6 General Constraints

2.6.1 Laws and regulations to be complied with

Specific laws to be complied with include:

The *Contractor*, at its own expense, complies with:

- the Nuclear Energy Act 92 of 1982,
- the National Key Points Act 102 of 1980,
- the Protection of Information Act 84 of 1982,
- the Occupational Health and Safety Act 85 of 1993 and its regulations,
- the Basic Conditions of Employment Act 75 of 1997. The *Contractor* indemnifies the *Employer* against any claims, proceedings, compensation, and cost arising from the *Contractor's* transgression of the Act,
- the Labour Relations Act 66 of 1995,
- the Medicine and Related Substance Control Act 101 of 1965,
- the National Health Act 61 of 2003,
- the Compensation for Occupational Injuries and Diseases Act 130 of 1993, and
- all laws, regulations, bye-laws, and requirements of local and other authorities which may be applicable to the *works* and as amended or replaced.

Where applicable, the *Contractor* complies with the *Employer's* Radiological Safety Regulations Programme, and in general, the whole framework of plant rules and regulations, which may be in force at the *Employer's* facilities from time to time.

While on the Site, the *Contractor* is always under the authority of the *Employer's* Power Station Manager for the purpose of giving effect to the provisions of the above. However, this does not in any way relieve the *Contractor* of his obligation to comply with the relevant legislation. Failure of the *Employer's* Power Station Manager to act in any specific manner does not make him or the *Employer* liable to the *Contractor* in any manner for any matter which may arise because of such failure to act.

2.6.2 Nuclear safety culture

Achieving continuous improvement in nuclear safety requires a culture that encourages setting and maintaining high standards; identifying and resolving problems and deficiencies; openness to criticism and recommendations for improvement; and mutual respect and effective communication and independent oversight.

This culture can only be established if the *Contractor* is fully committed to its nuclear safety responsibilities. It is the *Employer's* requirement that the *Contractor* establishes and maintains such a culture.

2.6.3 Confidentiality and publicity

The exchange between the Parties or the disclosure to third parties of information is subject to the provisions of the Nuclear Energy Act 92 of 1982, the National Key Points Act 102 of 1980, and the Protection of Information Act 84 of 1982. The *Contractor* agrees that neither the *Contractor* nor its employees, agents or sub-contractors make any public statements or release to any third party (including the *Adjudicator*) any information concerning the performance of any work without first obtaining the written approval of the *Project Manager*. Requests to release information are co-ordinated by the *Project Manager* through the designated

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Employer's Commercial Manager or the *Employer's* Power Station Manager. The *Contractor* ensures adherence of its employees, agents, and sub-contractors to this restriction.

2.6.3.1 Reporting culture

The *Contractor* is required to have a process or means by which the workers (all organisational levels) can report issues and incidences that negatively (or have the potential to) affect performance, without fear of retaliation or punitive action.

The *Contractor's* process must be such that the information is captured, analysed and the resulting corrective actions taken because of the reports are identified and tracked, for implementation and improvement. All such reported issues are shared with the KOU, for purposes of capturing in the KOU Corrective Action Programme (CAP).

2.6.3.2 Observation programme

It is desired (not expected) that the *Contractor* can perform initial investigations into human performance events to determine the contributing factors (error precursors and organisational weaknesses). The *Contractor* must however support and co-operate with any such investigation by KOU.

The *Contractor* is required to have a process whereby workers' at-work behaviours in the field are observed and coached against a set of formalised best practice criteria. This is to reinforce the desired standards and behaviours expected on the job site and to provide assurance that the *Contractor's* workers and supervisors are adhering to standards. The *Contractor's* workers must be coached where deviations from standards and expected behaviours are detected.

This information is captured, by the *Contractor*, in a means that allows review of previous observations performed for the identification of potential trends in worker behaviours that could potentially lead to an event. Actions are to be developed and implemented to address such trends. The *Contractor's* process must have an auditable trail.

2.6.4 *Employer's* Site access control

2.6.4.1 Fitness for duty management

The *Contractor* adheres to the *Employer's* procedure fitness for duty requirements for vendors and contractors who are required to perform work inside the owner-controlled areas of KNPS (335-68). This document is not applicable to visitors. Accesses for visitors are dealt with in KAA-777 [76].

The objective of the *Employer's* FFD programme is to provide reasonable assurance that the *Contractor's* plant workers shall perform their tasks in a reliable and trustworthy manner and are not under the influence of any substance or suffer from any health impairment which in any way adversely affects their ability to perform their duties safely and competently. The FFD programme also gives reasonable assurance that the workforce has been trained and their technical competence has been assessed.

The *Employer's* FFD process is designed to only allow the *Contractor's* employees to perform work if they:

- Have valid identification documents.
- Have been declared free of drugs and alcohol.
- Have been declared healthy, physically able, and free of any medical condition that could impair their ability to perform the work they have been appointed for.
- Have valid work permits.
- Have completed the security background verification process.
- Have the qualifications required for the task.
- Have the minimum plant access training required to work on site.
- Have been declared competent and authorised to perform the work they have been appointed for.
- Have received specific training required for the work they shall be required to perform; and
- Have signed a non-disclosure agreement to protect the *Employer's* information, they encounter.

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2.6.4.2 FFD requirements before registration takes place.

Information the *Contractor's* employee must supply:

- Identification document.
- Work permit (non-SA citizens).
- Qualifications.
- Curriculum Vitae (CV).
- Criminal record history; and
- Proof of residential address.

Forms that the *Contractor's* employee must sign:

- Pre-placement medical examination.
- Baseline questionnaire for audiometry.
- Medical declaration.
- Security permit application.
- Consent to disclose criminal information (if the *Employer* is performing the criminal check).
- SAPS enquiry; and
- Non-disclosure agreement (protection of information).

Activities to be performed before the *Contractor's* arrival at the Site:

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Recruitment & Selection		X		<i>Contractor's</i> own planning	
ID Document		X	Proof of identification is required before that the <i>Contractor's</i> employee is allowed to register on the FFD system.	<i>Contractor's</i> own planning	The following identification documents are the only documents that shall be accepted as proof of identification. <ul style="list-style-type: none"> • South African Identification Book issued by the Department of Home Affairs. (Green ID) or • Valid Official Passport or • Valid Temporary Identification Document issued by the Department of Home Affairs.
Proof of Residential Address		X	Proof of residential address is required before that the <i>Contractor's</i> employee is allowed to register on the FFD system.	<i>Contractor's</i> own planning	The proof may not be older than 3 months when the <i>Contractor's</i> employee is enrolled on the FFD system.

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
CV and Qualifications		X	Authenticated qualifications to be presented before registration takes place.	<i>Contractor's</i> own planning	<ul style="list-style-type: none"> • CVs of <i>Contractor</i> employees are included in the documents where this is required by the procedure. • The <i>Contractor's</i> employees must be in possession of his/her CV when he/she arrives on site to start the FFD process. • The <i>Contractor</i> is required to verify the authenticity of the qualifications that is required for the work that is to be performed on Site. The <i>Employer</i> retains the right to verify any tertiary qualification that an applicant is required to have to work in a specific discipline. • The <i>Contractor</i> ensures that his employee has the original (or certified copy) of the qualifications when he/she is registered on the FFD system. • Persons not in possession of the qualifications required by the <i>Employer</i> are not considered for employment by the <i>Contractor</i> (in that discipline).
Criminal History		X	Assessment of criminal history.	<i>Contractor's</i> own planning	<ul style="list-style-type: none"> • Terminate Process Hold Point • The criminal history of an applicant shall be assessed before access to the Site is considered. • SA citizens obtain their criminal history reports from the South African Police (SAPS). The report may not be older than 3 months when the <i>Contractor's</i> employee is enrolled on the FFD system. This service is also available from the <i>Employer's</i> Security section. South African applicants are required to give their consent to the <i>Employer</i> to obtain the relevant information from the SAPS. • Non-South African citizens are required to provide proof of their criminal history. The criminal history report from their country's law enforcement agency or INPO (USA citizens only) is dated within three months of their required access date. • Persons with a criminal background that is deemed to be a security risk to the Site are not to be considered for employment by the <i>Contractor</i>. • The <i>Contractor's</i> employee shall be in possession of the proof of criminal history when he/she arrives on site to start the FFD process.

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Complete Man Job Spec Form	X	X	Contractor to complete with <i>Project Manager</i> .	<i>Contractor's</i> own planning	<ul style="list-style-type: none"> • The <i>Contractor</i> ensures that an occupational health services job specification form is completed, in conjunction with the <i>Project Manager</i>, for each of his employees and all signatures are obtained before the health assessment is arranged. • These forms are obtainable from the <i>Employer</i> at Koeberg. The form identifies the work scope, the occupational hazards that the <i>Contractor's</i> employee shall be exposed to and the physical attributes that are required for the execution of the tasks. • The <i>Contractor's</i> employee shall be in possession of the completed and signed occupational health services job specification form when he/she arrives on site to start the FFD process.
Drug Test		X	Negative drug test to be presented before registration takes place.	<i>Contractor's</i> own planning	<ul style="list-style-type: none"> • Terminate Process Hold Point • <i>Contractor</i> ensures that their employees have been tested for drugs before they arrive on site to start the FFD process. Persons with a positive drug test result are not considered for employment by the <i>Contractor</i>. • Persons with positive drug tests shall not be allowed to register for the FFD process. • The <i>Contractor's</i> employees must be in possession of the drug test results when he/she arrives on site to start the FFD process.

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Health Assessment		X	Medical examination to be presented before registration takes place.	<i>Contractor's</i> own planning	<ul style="list-style-type: none"> • Terminate Process Hold Point • The <i>Contractor</i> ensures that all his employees complete a health assessment before they arrive on site to start the FFD process. The occupational health services job specification form is required by the occupational health practitioner for the health assessment. • Applicants that are not declared fit to do the work specified in the occupational health services job specification form are not allowed to register on the FFD system. • Health assessments are only performed by <i>Employer</i> registered Occupational Health Practitioners. • The health assessment report is not older than 3 months when the <i>Contractor's</i> employee is enrolled on the FFD system. • Persons that are not declared fit to perform the work specified in the occupational health services job specification form are not considered for employment by the <i>Contractor</i>. • The <i>Contractor's</i> employee must be in possession of the medical assessment results and other relevant documentation when he/she arrives on site to start the FFD process.
Work Permit		X	Work permits to be obtained before registration takes place.	<i>Contractor's</i> own planning	<ul style="list-style-type: none"> • Terminate Process Hold Point • Non-South African Citizens are required to be in possession of the relevant Work Permit as required by the Immigration Act before access is considered. • Persons not in possession of a valid work permit is not considered for employment by the <i>Contractor</i>. • The <i>Contractor's</i> employee must be in possession of the original work permit when he/she arrives on site to start the FFD process.

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Registration on FFD System	X	X		Contractor's own planning	<ul style="list-style-type: none"> • Contractor's employees are registered on the Employer's FFD system by a person appointed by the Employer. This could be an employee of the Contractor, if appointed by the Employer. The Project Manager is responsible to arrange this activity. Registration is only performed if the Contractor's employee is in possession of all the documentation required for registration. • If the Contractor's employee is in possession of all the required documents, the individual shall be registered and issued with a bar coded form.
Training Requirements Form	X	X	Project Manager and Contractor to supply.	Contractor's own planning	<ul style="list-style-type: none"> • The scope of each Contractor employee's work requirements is to be assessed to identify the training and/or technical assessments that are required before work may commence. • All Employer training sessions includes an assessment at the end of each session. Persons that do not pass any training assessments and/or technical assessments as identified for the scope of work are not allowed to continue with the FFD process and shall be required to leave the Site. • The Project Manager identifies any specific training needs of each individual or group of individuals (based on the planned work scope) and ensures compliance to the training requirements identified for the specific duties before access to Site is considered. • The Contractor's employee must be in possession of the training requirements form when he/she arrives on site to start the FFD process.
FFD Bookings	X	X		Contractor's own planning	<ul style="list-style-type: none"> • Contractor's employees are booked on the Employer's FFD system by a person appointed by the Employer. This could be an employee of the Contractor, if appointed by the Employer.
Asbestos Training		X	Training that the Contractor's employee must complete (only if required)	Contractor's own planning	<ul style="list-style-type: none"> • Only if required.
Confined Space Training		X	Training that the Contractor's employee	Contractor's own planning	<ul style="list-style-type: none"> • Only if required.

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
			must complete (only if required)		
Basic Rigging Training		X	Training that the <i>Contractor's</i> employee must complete (only if required)	<i>Contractor's</i> own planning	<ul style="list-style-type: none"> Only if required. The <i>Contractor</i> verifies the validity of prior learning.
Non-Disclosure Agreement		X	All <i>Contractor</i> employees are required to sign a non-disclosure agreement	<i>Contractor's</i> own planning	<ul style="list-style-type: none"> The <i>Contractor</i> ensures that a non-disclosure agreement is signed form is signed by each employee before the person is registered to start the FFD process. These forms are obtainable from the <i>Employer</i> at Koeberg.
Security Permit Application	X	X	<i>Project Manager</i> and <i>Contractor</i> to supply	<i>Contractor's</i> own planning	<ul style="list-style-type: none"> The <i>Contractor</i> ensures that a security permit application form is completed for each employee before the person is registered to start the FFD process. These forms are obtainable from the <i>Employer</i> at Koeberg. It is important that the form is completed by the <i>Contractor</i> in conjunction with the <i>Project Manager</i>. The form identifies the security areas that the <i>Contractor's</i> employee is required to enter for the execution of the tasks. The <i>Contractor's</i> employees must be in possession of the security permit application when he/she arrives on site to start the FFD process.

2.6.4.3 Fraudulent Documents

The *Contractor's* employees that have presented fraudulent documentation are permanently denied access to the *Employer's* Koeberg site.

2.6.4.4 False Declarations

The *Contractor's* employees that have made false declarations are permanently denied access to the *Employer's* Koeberg site.

2.6.4.5 FFD requirements after registration takes place.

Activities to be performed after the *Contractor's* arrival at the Site:

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Enrolment on FFD System	X	X	<i>Contractor's</i> employees shall be enrolled on the <i>Employer's</i> FFD system by the	10 min	<ul style="list-style-type: none"> A <i>Contractor's</i> employee shall not be allowed to attend any further FFD activities if he/she is not enrolled on the FFD system and issued with a bar coded form.

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
			Security Group when they arrive on site.		
Drug Test	X	X	All the <i>Contractor's</i> employees are required to perform a drug test administered by the <i>Employer</i> . This test shall be done notwithstanding the test done by the <i>Contractor</i> .	30 min	<ul style="list-style-type: none"> The <i>Contractor's</i> employees that fail the drug test are not allowed to continue further on the FFD process and shall be required to leave the Site and shall be denied access for at least 12 months.
Criminal History Verification	X	X	All <i>Contractor</i> employees that apply for a security permit to access the Site are required to give consent to the <i>Employer</i> to verify their criminal background. This activity is performed on site by the <i>Employer's</i> Security staff for South African citizens by the taking of a set of fingerprints and forwarding same to the SAPS for verification.	30 min	<ul style="list-style-type: none"> South African citizens who have obtained their criminal records direct from the South African Police are only required to provide the <i>Employer's</i> Security staff with a set of fingerprints, for record purposes. <i>Contractor</i> employees with a criminal background that is deemed to be a security risk to Koeberg are denied access to the Site.
Health Verification	X	X	<i>Contractor</i> employees are required to report to the <i>Employer's</i> Health Services section where the medical examination performed off-site shall be verified to ensure that all requirements have been met.	30 min	<ul style="list-style-type: none"> The duration of this activity is approximately 30 minutes.

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Induction Training including: <ul style="list-style-type: none"> • SAT • PIT • FME (Generic) • Human Performance 	X	X	<ul style="list-style-type: none"> • Site Access Training (SAT) <i>Contractor</i> employees that are required to work outside the protected area of KNPS are required to complete the SAT course before work may commence. • Plant Induction Training (PIT) <i>Contractor</i> employees who are required to work inside the protected area of KNPS are required to complete the Plant Access Training (PAT) course before work may commence. • Foreign Material Exclusion Training (FME) <i>Contractor</i> employees coming to site that require access to FME zones or shall perform any hands-on work on the plant are required to complete this training. • Human Performance Training (HPT) <i>Contractor</i> employees that are required to work inside the protected area of KNPS shall complete the Human Performance Training (HPT) before work may commence. 	8 hours	<ul style="list-style-type: none"> • Site Access Training (SAT) The SAT course is designed for persons working only in the OCA. Their security permits shall not allow them access to the protected area of KNPS. <i>Contractor</i> employees that do not successfully complete the SAT course shall not be allowed access to the Site. • Plant Induction Training (PIT) <i>Contractor</i> employees that do not successfully complete the PIT course are not allowed access to the Site. <i>Contractor</i> employees required to perform work in the intake basin are required to pass the PIT. • Foreign Material Exclusion Training (FME) <i>Contractor</i> employees that do not successfully complete the FME course are not allowed access to FME zones. Personnel required to perform hands-on work on the plant and for which FME was identified as part of the training requirements that do not complete the FME course successfully are not allowed access to the plant. • Human Performance Training (HPT) <i>Contractor</i> employees that do not successfully complete the HPT course are not allowed access to Site. <i>Contractor</i> employees required to perform work in the intake basin are required to pass the HPT course.

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Induction to Working at Heights / Material Handling	X	X	<ul style="list-style-type: none"> Contractor employees are required to successfully complete the required Working at Heights/ Material Handling training before working at heights or handling material is considered. 	8 hours	<ul style="list-style-type: none"> Only if required. Failure to successfully complete the Working at Heights / Material Handling training shall result in restriction to work at heights or handling material being prohibited.
Radiation workers Training	X	X	<ul style="list-style-type: none"> Contractor employees are required to successfully complete the required radiation worker training before access to radiation zones is considered. 	3 days	<ul style="list-style-type: none"> Only if required. Failure to successfully complete the radiation training shall result in access to radiation zones being restricted.
Induction to Confined Space	X	X	<ul style="list-style-type: none"> Contractor employees are required to successfully complete the required confined space training before access to confined space is considered. 	2 hours	<ul style="list-style-type: none"> Only if required. Failure to successfully complete the confined space training shall result in access to confined space being restricted.
Induction to Asbestos Training	X	X	<ul style="list-style-type: none"> Contractor employees are required to successfully complete the required Asbestos training before access to Asbestos zones is considered 	1 hour	<ul style="list-style-type: none"> Only if required. Failure to successfully complete the Asbestos training shall result in access to Asbestos zones being restricted.
Induction to Basic Rigging	X	X	<ul style="list-style-type: none"> Contractor employees are required to successfully complete the required Rigging training before rigging work is considered. 	8 hours	<ul style="list-style-type: none"> Only if required. Failure to successfully complete the Rigging training shall result in rigging work being prohibited.

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Supervisor Training	X	X	<ul style="list-style-type: none"> Contractor employees are required to work as supervisors must successfully complete the required supervisor training before work is considered. 	2.5 days	<ul style="list-style-type: none"> Only if required. Failure to successfully complete the supervisor training shall result individual being prohibited to do supervision.
Technical assessment <ul style="list-style-type: none"> Mechanical Machining MC&I Electrical Welding Pipe Fitting Civil TA 4 I&T MSS 	X	X	<ul style="list-style-type: none"> Contractor employees who are required to perform work of a technical nature inside the protected area of Koeberg are required to perform technical assessments and be authorised to perform the work that they have been assessed for. 	4hrs - 16p 12hrs - 3p 16hrs - 16p 8hrs - 4p 4hrs - 6p 6hrs - 4p 6hrs - 4p 8hrs - 4p	<ul style="list-style-type: none"> Only if required. The <i>Project Manager</i> is responsible to indicate the work that the <i>Contractor's</i> employee shall be performing on the Site. Contractor employees that do not successfully complete the technical assessment shall not be allowed to perform work on the Site. The duration of this activity depends on the type of work discipline and scope and is between 4 hours and two days.
Final acceptance and Issuing permit.	X	X	<ul style="list-style-type: none"> All required FFD requirements are completed successfully before final acceptance is processed and a security permit is issued by the Security Group. 	30min	

2.6.4.6 Medical examinations

Medical examinations are done by *Employer* approved external medical practitioners. These are:

Occupational Health Practice	Contact Person	Telephone	e-mail address
Life Occupational Health	Magda van Zyl	0215917050	Magda.VanZyl@lifehealthcare.co.za
Incon	Benita Du Preez	021 975 2694 ext. 2001	benita@incon.co.za
OCSA	Sibusiso Ngubane	0219810141	sibusison@ocsa.co.za
EOH	Pam Kinnock	0212527750	Pam.Pinnock@eoh.co.za
Fair Care Health	Colleen Paul	021 552 1377	hmalaka@msn.com

The *Contractor* is responsible for the cost and completion of the medical examination by his personnel prior to them coming to Site.

The *Contractor* is liable for payment of medical examinations and COVID -19 screening of staff.

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2.6.4.7 Criminal record check verification service provider

For all background screenings and qualification verifications.

4 Denne Ave, Panorama, Cape Town, 7506

Office Number 021 911 5011 / 021 911 5338

Fax: 086 750 2734

Cell: 084 8500 432, e-mail: call@nevetec.co.za

www.nevetec.co.za

2.6.4.8 Covid-19 controls

- Mask shall be provided by the *Contractor* and employees shall always wear it while at the Affected Property
- Temperature screening must be done outside of FFD centre in the allocated location, before proceeding to the Medical Centre reception desk.
- Hand sanitisers are in place and the practicing of social distancing shall be strictly adhered to.

2.6.4.9 Exit procedure.

The *Contractor* ensures that permit holders that no longer require access to the Site follow the *Employer's* FFD exit procedure. Failure to do so may result in the *Contractor's* or his Subcontractor's employee being denied access to the Site in future.

The duration of the exit activity is approximately 90 minutes and includes an exit medical examination.

2.6.4.10 Security check points

Prior to access to Site, the *Contractor* passes through various security check points, via entrance at the R27 access gate, entrance at the Duynfontein entrance and at Access Control Point 1 (ACP-1). All temporary workers/visitors permit are issued at ACP-1.

2.6.4.11 Access to Radiological Areas "Controlled Zones" and Reactor Building

Where work is to be performed in a radiological area (Controlled Zone), the *Contractor* needs to pass through a dosimetry-issue check point.

General access for inspections and measurements in the reactor buildings are not allowed during the operation of the plant and are limited during the refuelling outages with access limitations in accordance with KSA-062.

Access to radiological areas is subject to all training and verifications being completed as stated in this Works Information.

2.6.4.12 Prohibited/unauthorised items on site.

In terms of the National Key Point Act 102 of 1980, Koeberg Operating Unit is a declared National Key Point (NKP). The National Key Point Act requires and empowers the owner of the National Key Point (Power Station Manager), to implement measures that shall ensure the security of the National Key Point. The National Key Point area at the power station is the area within the protected area barrier (ACP 2 inwards).

One such security measure is procedure KAA-777 Revision 4 (Process for access to Koeberg Nuclear Power Station) [76]. The procedure stipulates that the following items are prohibited from being brought onto site, unless specifically authorised:

- explosives or components thereof,
- habit forming drugs,
- alcohol,
- mercury,
- acids,
- cellular phones,
- firearms, ammunition, or any part thereof, and

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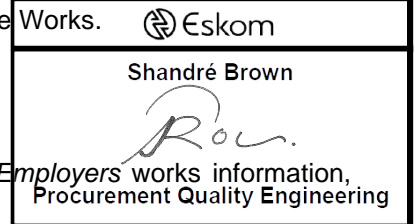
- cameras

Contractor personnel violating the procedure shall be investigated and may result in action being instituted against such individuals and possible removal from site.

To keep the *Contractor* informed, pictograms of the items are placed at all ACP 2 access points, and it is also addressed in the Plant Induction Training (PIT). It is the responsibility of each of the *Contractor's* employees to ensure compliance and to refrain from bringing prohibited/unauthorised items onto site.

2.6.4.13 Vehicles and tools/Equipment

All Equipment and tools are subject to a security screening before they are allowed on the Site. All Equipment and tools must be listed and specified before they are brought on Site. This list shall serve as evidence for removal permits upon Completion of the *works*. Vehicles are only allowed on Site if justification is provided to the *Project Manager* that such a vehicle is essential to Provide the



2.7 Quality Assurance and Control

2.7.1 Quality assurance requirements

- The engineering classification assigned to the works is contained in the *Employers works information*, section 3.3.2 (Classification).
- At least one of the *Contractor* engineering personnel required to sign as Compiler, Reviewer and Approver of documents and drawings, for the required processes in KAA-501 [61] and 331-86 [21], shall be a registered professional engineer or equivalent, as approved by the *Employer* in accordance with ECSA guidelines.
- The *Contractor's* QMS shall be certified to ISO 9001:2015 and is subject to review and acceptance by the *Employer*.
- The *Contractor* shall implement and maintain a Quality Management System (QMS) that complies with the *Employer's* Quality Specification DSG-318-087 [44].
- Within 30 days after contract award, the contractor submits a Contract Quality Management Plan (CQMP) for the *Employer's* review and acceptance, which meets the requirements of DSG-318-087 [44]. The *Contractor* shall notify the *Employer* of any deviations or discrepancies regarding the Contract Quality Management Plan implementation.
- The *Contractor* shall identify, in purchase documents to subcontractors, all applicable quality and QA requirements imposed by the *Employer's* specification on the *Contractor* and shall ensure compliance thereto. The *Contractor* ensures that any subcontractor employed by him has and implements a Quality Management Programme to meet the requirements of the *Employer*.
- The *Contractor* shall provide Quality Control Plans (QCP's) as well as Inspection and Test Plans (ITP's) to the *Employer* for review and acceptance for various phases of all works carried out prior to commencement of the works. The *Employer* reserves the right to add hold and witness points.
- The *Contractor's* QCP for the installation of the new KIS system shall be based on proven OE.
- Installation of the new KIS system shall be done by the *Contractor* or Sub-Contractor with verifiable experience.
- The *Employer*, the *Employer* Quality Control (QC) representative and the *Contractor* shall review these QCP's/ITP's jointly and the actual scope of quality control and inspection required for the *Contract* agreed upon.
- The *Contractor* shall submit an updated copy of the QCP's and ITP's.
- The *Contractor* is hereby informed that any work product arising from this specification may be submitted to the National Nuclear Regulator or other regulatory bodies as required by South African laws and regulations.
- *Contractor* personnel performing the design and installation work shall be qualified by means of formal technical qualifications and have sufficient experience with work of similar nature. Qualifications and experience of key staff shall be provided by the *Contractor* during any tendering processes.

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- The Contractor shall provide proof of previous projects in the nuclear industry, or as a minimum in highly regulated industries.
- The Contractor shall supply all test certificates and documentation in English, using SI units.
- The *Contractor* controls and supervises his subcontractor's quality plans (including manufacturing quality plans). The *Contractor* reviews and accepts all plans, prior to submission to the *Project Manager*, for his acceptance. All subcontractor components are verified by the *Contractor's* technical representative(s) before use or installation.
- If the subcontractor must perform work in terms of the *Contractor* compiled quality plans, the subcontractor also reviews and accepts the use thereof.
- The *Employer* reserves the right to, at any time, audit and/or monitor the control between the *Contractor* and subcontractor, as well as the performance of the *Contractor's* subcontractor. Such audits are done by prior notification and in liaison with the *Contractor*.
- The duly authorised representative of the *Employer* and *Employer's* Appointed Inspection Authority (AIA) or the regulatory body is offered access to the *Contractor* and its subcontractor's premises at reasonable times to monitor compliance with quality management requirements and to participate in final inspections.
- The *Contractor* ensures that his staff and subcontractors are conversant with the content of the works as defined by the Works Information, quality control plans/work plans and work instructions.
- *Contractor's* authorisation of personnel (including subcontractor personnel), applied for Providing the Works, is made available to the *Project Manager* prior to the start of the work for which the authorisation is done.
- The *Contractor* retains records of internal reviews performed by its personnel. The records provide objective evidence of who performed the review and the level of detail of the review. This requirement is also applicable to review of subcontractor deliverables. Where considered necessary, the *Project Manager* may request such review records and the *Contractor* provides such information without limitation.
- Where considered necessary, the *Project Manager* may request the root cause analysis and associated corrective action plan that the *Contractor* has established to deal with non-conformances / issues and / or Defects related to providing the Works. The *Contractor* provides such information without limitation.
- For mechanical projects, the *Contractor* demonstrates compliance to ASME III 2001 [37] (for works affecting safety class piping and components), ASME B31.1 [36] (for non-safety class piping) and ASME VIII (for pressure vessels).
- The *Contractor* shall provide proof of previous projects in the nuclear industry, or as a minimum in highly regulated industries.

2.7.2 Quality Control Requirements

- The *Contractor's* and subcontractor's quality control programmes are subject to the acceptance by the *Employer*.
- The *Contractor* ensures that all specifications and requirements are communicated to the relevant parties in his organisation and does not deviate from it.
- All *Contractor's* Quality Control Plans (QCP)s are accepted by the *Project Manager*, the *Contractor*, and the *Employer's* Appointed Inspection Authority/QA representative (as applicable) prior to the commencement of work. Only after acceptance of these documents by the *Project Manager* and the *Employer's* QA representative / AIA as applicable, may the work proceed.
- The *Contractor* ensures that all work (*Contractor* and subcontractor work) is carried out in accordance with the QCPs or any other specifications through written instructions from the *Project Manager*. All documentation has a clearly stated revision number and previous similar documentation is revoked.
- All quality related problems/issues are reported and resolved as Defects in terms of Core Clause 42.2. All completed work is signed off in the QCPs as the work progress and all the relevant signatures are made on the documentation. The *Contractor* and his subcontractor employ's quality control representatives, with appropriate proven experience.

2.7.3 Contractor's Quality Control Plans (QCPs)

The QCP typically consist of the following as a minimum:

- A cover page that includes and makes provision for the following:
 - Document unique number
 - Revision number
 - Page number
 - Provision to incorporate all inspection report numbers.
 - Plant/system worked on
 - High level description of work execution
 - Provision for review and acceptance signatures by the *Contractor*, the *Employer* and the *Employer's* AIA/QA representative (where applicable).
 - Provision for final release signatures by the *Contractor*, the *Employer* and the *Employer's* AIA/ QA representative (where applicable).
- A page which includes a high-level logical sequence of work execution
- A page which includes:
 - Drawing numbers
 - Abbreviations
 - Records numbers
 - Procedures numbers
 - Reference document numbers
 - Certificate numbers and references
- The work execution logic and sequence.
- Hold and witness points,
- A Materials summary that includes:
 - Material quantities and dimensions
 - Material certificate numbers or receipt inspection reference numbers with adequate traceability to material/other certificates.
- A thickness test report where thickness tests are carried out on components. The thickness test results are recorded, and the positions of the measurements are traceable to the specific area of testing against the records.

If the subcontractor must perform work in terms of the *Contractor* compiled quality plans, the subcontractor also reviews and accepts the use thereof.

The *Employer* reserves the right to, at any time, audit and/or monitor the control between the *Contractor* and subcontractor, as well as the performance of the *Contractor's* subcontractor. Such audits are done by prior notification and in liaison with the *Contractor*.

The duly authorised representative of the *Employer* and *Employer's* Appointed Inspection Authority (AIA) or the regulatory body is offered access to the *Contractor* and its subcontractor's premises at reasonable times to monitor compliance with quality management requirements and to participate in final inspections.

The *Contractor* ensures that his staff and subcontractors are conversant with the content of the *works* as defined by the Works Information, quality control plans/work plans and work instructions.

Contractor's authorisation of personnel (including subcontractor personnel), applied for Providing the Works, is made available to the *Project Manager* prior to the start of the work for which the authorisation is done.

The *Contractor* retains records of internal reviews performed by its personnel. The records provide objective evidence of who performed the review and the level of detail of the review. This requirement is also

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applicable to review of subcontractor deliverables. Where considered necessary, the *Project Manager* may request such review records and the *Contractor* provides such information without limitation.

Where considered necessary, the *Project Manager* may request the root cause analysis and associated corrective action plan that the *Contractor* has established to deal with non-conformances / issues and / or Defects related to providing the Works. The *Contractor* provides such information without limitation.

For mechanical projects, the *Contractor* demonstrates compliance to ASME III 2001 [37] (for works affecting safety class piping and components), ASME B31.1 [36] (for non-safety class piping) and ASME VIII (for pressure vessels).

2.7.4 Inspections

- *Employer* shall have the right to establish inspection and hold points for which the *Contractor* shall give advance notification. In addition, the *Employer* can establish temporary notification points to ensure resolution of temporary quality problems.
- Mandatory hold points shall be considered to be those tests, inspections, and operations which require witnessing by the *Employer's* Quality Representative (EQR) and beyond which operations shall not proceed without written consent of the *Employer*.
- Witness points shall be critical steps in manufacturing and testing where the *Contractor* and subcontractors shall be required to notify the *Employer* in advance of the activity so it can be witnessed. The *Contractor* and subcontractors can proceed with work past the activity if the EQR is not available at the designated time.
- Shop inspection performed by the *Employer* shall not relieve the *Contractor* of its obligation to maintain an adequate test, inspection, and documentation program or any other obligation under this specification. Furthermore, the fact that the EQR might inadvertently overlook a deviation from some requirement of this specification shall not constitute a waiver of that requirement nor the *Contractors* obligation to correct the condition when it is discovered nor any other obligation under this specification.

2.7.5 Non-conformances

- No deviation from applicable codes and standards is acceptable. Furthermore, no deviation or departure from any requirement of this specification shall be acceptable without written approval from the *Employer*.
- The *Contractor* shall promptly document and notify the *Employer* of all non-conformances from the specification and proposed remedial actions.
- Non-conformance shall be identified as correctable or uncorrectable by the *Contractor*. Uncorrectable nonconformances are conditions that cannot be corrected within the specification requirements by rework or replacement.
- Non-conformances shall be submitted to the *Employer* for review by the *Contractor* and approval by the *Employer's* Engineering Representative.
- The *Employer* shall have the right to reject a component following the assessment of any non-conformance.
- The non-conformance register and all closed non-conformances, inclusive of all engineering work, justifications, corrective actions history and *Contractor* and *Employer* approvals, shall be part of the End of Manufacturing Report submitted by the *Contractor*.
- All subcontractor non-conformances shall be reported, addressed, and managed as stated above by the *Contractor*.

2.8 Programming constraints

2.8.1 Programme constraints and requirements

The *Contractor* prepares and submits at the stated intervals, all programming documentation described in this section, the layout of which is subject to the *Project Manager's* acceptance.

All work performed at KOU are planned and scheduled in accordance with the requirements stated in:

- KLA-023 [99] for outage related *works*
- KAA-721 [72] (for non-outage related *works*) – including pre-outage installation *works*.

Note that the above makes specific reference to the timelines to be adhered to for scheduling the work. As a general guide, outage work must be finalised and detailed SAP notifications, orders and operations raised on the *Employer's* SAP system at 6 months prior to the start of the outage; and for non-outage work, the SAP notifications, orders, and operations must be raised 12 weeks prior start of work. "Finalised" means that the work plans, and test procedures are completed, which include any related risks assessments associated with the work to be performed.

2.8.1.1 The programme

The programme shows all the information required by Clause 31.2 of the ECC3.

In addition, the programme shows:

- the services and work (programmes) of the subcontractors,
- interfaces between subcontractors as well as the interfaces between subcontractors and the *Contractor*,
- all activities defined in the *activity schedule*,
- dates for placement of orders for critical / major Plant, Material and Equipment,
- on Site delivery dates for Plant, Materials and Equipment,
- the programme's revision number.

The contractor complies with AACE RP on CPM schedule.

Manually applied constraints such as "must start" or "must finish" fixed dates, "zero float" and other programming techniques, that can have the effect of inhibiting the programme from reacting dynamically to change, is not acceptable.

A separate programme (Outage Implementation Programme) detailing pre-outage implementation and outage implementation may be compiled for each refuelling outage, as an extract from the Accepted Programme. This shall facilitate integration of the *Contractor's* outage programme into the *Employer's* overall outage plan. The *Contractor* ensures that the start and finish dates of the "Outage Implementation Programme" corresponds to the Outage Implementation dates of the Accepted Programme.

The Minister of Public Enterprises and Presidential Infrastructure Coordinating Committee (PICC) requested that all government entities and SOCs use Primavera computerised planning software. For the sake of compatibility, the *Contractor* therefore prepares his programme on Primavera version 6.7 (.xer file format) computerised planning software and utilises it for all planning, progress monitoring and reporting.

2.8.1.1.1 Reporting on progress and remaining duration

Rules of Credit for progress measurement to be based on recommended practice for the specific work package. Methodology to be detailed in the Schedule basis document.

2.8.1.1.2 Actual dates

When Completion of any activity is confirmed by quoting document numbers, these numbers are given in the notes and are appended, e.g., letters of acceptance, suborders, drawings, inspection certificates, delivery notes, etc. The actual start and finish of all activities are reported and included in the programme.

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2.8.1.1.3 Time Now Date

The 'Time Now Date', unless otherwise agreed between the *Project Manager* and the *Contractor*, is the assessment date of each month.

2.8.1.1.4 Stress Test

The *Contractor* performs the following stress test prior to submission to the *Project Manager* for acceptance:

Stress Test	Name	Description
1	Logic links	<p>Every activity must have a predecessor and successor:</p> <ul style="list-style-type: none"> Each Activity should have at least one predecessor (connected to its Start) and one successor (connected to its Finish). This includes checking for 'dangling Activities' that have only a 'start predecessor' relationship or only a 'finish predecessor' relationship but not both. Incorrect and missing logic shall result in the Critical Path and likely completion date being inaccurately calculated considering the progress achieved.
2	Negative Lag	<p>There must be no logic links carrying Negative Lag:</p> <ul style="list-style-type: none"> Predecessor/successor relationships in the Programme need to be checked to see that there is no Negative Lag (i.e., overlap by way of a Duration of less than zero) present against the Logic Links. The Critical Path analysis is made more difficult or distorted through use of Negative Lag as it hides detail in the Programme.
3	Lead	<p>There must be no Finish-Start Logic Links carrying Lead between Activities:</p> <ul style="list-style-type: none"> Predecessor/successor relationships in the Programme need to be checked to ensure that there is no Lead (i.e., overlap by way of a Duration of greater than zero) present against Logic Links. Lead makes it is hard to plan for or measure progress against. This distorts and complicates the Critical Path.
4	Logic type	<p>There must be no Start-Start and Finish-Finish Logic Links</p> <ul style="list-style-type: none"> Predecessor/successor relationships in the Programme need to be checked to ensure that no use of Start-Start and Finish-Finish Logic Links and that Finish-Start logic is employed. These links hide detail in the Programme and their use also create issues when Activities are subsequently progressed out of sequence with the remaining planned sequence and Critical Path distorted and complicated.
5	Hard Constraints	<p>There must be no hard Constraints:</p> <ul style="list-style-type: none"> Each Activity should be driven by Programme logic. A hard Constraint is an artificial date applied to an Activity that blocks the logic within the Programme, manipulates the Critical Path and introduces Negative Lag. It also prevents delays from properly impacting subsequent (successor) Activities within the Programme.
6	Float	<p>The (total) Float present should be less than twice the reporting period or 44 working days:</p>

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Stress Test	Name	Description
		<ul style="list-style-type: none"> • There must be no Activities or Milestones with total Float greater than twice the reporting period or 44 working days (two working months) within the Programme. • High Float values indicate that the Programme has not been broken down to a sufficient level of detail, sequencing has not been properly defined or that the Programme has not been properly logic-linked. • Programme logic and any resultant Float generated need to be considered properly since understanding the relative criticality of Activities and Milestones is essential to ensure timely delivery, and it affects any Critical Path analysis.
7	Negative Float	<p>All Float present in the Programme must be zero or above:</p> <ul style="list-style-type: none"> • There should be no Activities or Milestones with negative Float (i.e., less than zero total Float) within the Programme. • Negative Float within the Programme highlights that dates defined against Activities or Milestones cannot be achieved as currently planned and that the sequence, as defined, is unable to be achieved in line with the Completion Date(s). • Negative Float may also indicate that a delay is present against a hard Constraint which has been applied to the Programme.
8	Long Durations	<p>Activity Durations present must be less than twice the reporting period or 44 working days:</p> <ul style="list-style-type: none"> • There must be no Activities with Duration longer than 44 working days. • High-Duration Activities are to be broken into several shorter Activities. • Excessive Durations can make it difficult to accurately record progress and it distorts the Critical Path
9	Invalid dates	<p>Progress and remaining <i>works</i> must be accurately set out with no invalid dates present:</p> <ul style="list-style-type: none"> • There must not be any invalid dates in the Programme where, based on the data/ progress/status date, planned <i>works</i> are shown to be in the past or actual <i>works</i> as having been completed in the future. • This can result in the Programme being inaccurate and if progress is not accurately or correctly recorded, it can also be in delay. • This criterion relates both to an initial Baseline Programme and to project performance tracking to ensure that the Programme is deliverable, and the as-built dates are accurate.
10	Missed detail	<p>Detail set out in the Programme must be reflective of the full scope of <i>works</i>:</p> <ul style="list-style-type: none"> • The <i>works</i> breakdown structure and detail set out in the Programme should be reflective of the full scope of the project and any sections where applicable. • The applicable scope needs to be identified from contract documents and suitably incorporated into the Programme. • A failure to correctly include the relevant <i>works</i> or detail / interfaces within the Calendars can result in a planned sequence being incorrect, an intrinsic delay being present or the forecast completion dates being unachievable.

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Stress Test	Name	Description
11	Key dates	<p>Key Dates and Completion Dates forecast in the Programme must be reflective of obligations set out in the Contract Data:</p> <ul style="list-style-type: none"> • Key Dates and Completion Dates detailed and forecast in the Programme must be reflective of the Sections of <i>works</i> and any commencement, access, intermediate or completion dates as and when applicable. • Failure to properly include Key Dates and Completion Dates for each section of the project shall affect the accuracy of the Critical Path shown, the planned sequence being incorrect and the forecast dates being unachievable.
12	Calendars	<p>Detail set out in the Programme must be reflective of any Calendars and/or restrictions:</p> <ul style="list-style-type: none"> • Activities and Milestones set out in the Programme must be reflective and planned to be delivered utilising the relevant Calendars and working restrictions where applicable. • Any applicable Calendars or working restrictions need to be identified from contract documents and suitably incorporated into the Programme. • Failure to correctly allocate Activities and Milestones within the Programme to the correct Calendars or consider any working restrictions can result in an intrinsic delay being present and the forecast completion dates being unachievable.
13	Unique identifiers	<p>There must be no duplication in the assigned Activity Names and Activity IDs:</p> <ul style="list-style-type: none"> • The description and ID of each Activity and Milestone in the Programme must be different to ensure ease of identification. • Duplication and repetition of Activity Names make it harder to differentiate between <i>works</i> when analysing the Programme and undertaking logic and Critical Path traces as well as application of filters.
14	Rescheduling	<p>Programme can be rescheduled without any of the planned dates moving:</p> <ul style="list-style-type: none"> • Rescheduling (or straight-lining/time analysing) the Programme results in the planning software calculating, based on the Logic, Durations and progress present, planned dates and Critical Path. • Programme must be able to be rescheduled without any dates moving as a means of demonstrating that it is properly logic-linked and dynamic. • This criterion relates both to an initial Baseline Programme and to project performance tracking to ensure that the Programme is deliverable and as-built dates are accurate. • Only when planned dates previously shown in the baseline prior to Rescheduling are maintained, with zero variance to each of the start and finish dates for each Activity/Milestone, is this Test deemed to have been successfully achieved.
15	Critical path	<p>There should be a Critical Path to each relevant Completion Date:</p> <ul style="list-style-type: none"> • The Critical Path is the path with the least amount of total float to the Completion Date(s) through the Programme. • Programme must be demonstrated to have a Critical Path to each relevant Completion Date.

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Stress Test	Name	Description
		<ul style="list-style-type: none"> Lack of a Critical Path (or Critical Paths) through the Programme indicates that inadequate logic is present, resulting in the Programme not being dynamic in nature.

The result of the test is submitted with each Programme submitted for acceptance.

2.8.1.2 Planning constraints

The *Contractor* makes allowance for incorporation of *Employer* acceptance review comments for documents delivered to the *Project Manager* for his acceptance.

The *Contractor* does not plan for any *Employer* activities during the period of week 51, week 52 and week 1 of each year unless such a period falls within the implementation window of the *works*. Should any reviews be planned during this period, then the review periods need to be agreed, upfront, with the *Project Manager*.

During refuelling outages, the *Employer's* resources may be limited to perform acceptance reviews, and should any reviews be planned over outage periods, then the review periods need to be agreed, upfront, with the *Project Manager*.

2.8.1.2.1 Outage planning and integration.

Outage work is limited to the *works* which can only be performed during the outage and *works* considered of too high risk (based on its accepted risk assessment) to be performed on-line (prior to outage).

On-line work is performed prior to the outage and the *Contractor* includes the activities on the Programme as well as makes the necessary planning allowances for it. On-line work shall only be approved subject to a *Supervisor* (and where applicable, *Employer*) accepted risk assessment.

To manage the occupancy of the Working Areas during implementation, the *Contractor* attends the "Table Top" meetings with the *Employer's* Outage representative to discuss area workload and to integrate and schedule the *Contractor's* activities as such as to allow sufficient space for implementation.

2.8.1.2.2 Outage dates

The *Employer* may change the proposed outage implementation dates due to any reason with no impact on the Prices within the framework described below:

- For *Employer* proposed delays to outage start dates more than 30 days, the *Employer* give 120 days' notice.
- For *Employer* proposed delays to outage start dates more than 15 days, the *Employer* give 60 days' notice.
- For *Employer* proposed delays to outage start dates between 7 and 15 days, the *Employer* give 45 days' notice.
- For *Employer* proposed delays to outage start dates between 1 and 7 days, the *Employer* give 30 days' notice; and
- For *Employer* proposed expediting (bringing forward) an outage start date, the *Employer* give 30 days' notice for each week (7 days) from the start date on the accepted programme.

The *Employer* may also change the proposed outage implementation dates, with no impact on the Prices, if the *Contractor* is late and is the cause of the change or if not ready in terms of KLA-023.

2.8.1.2.3 Outage readiness review

At 2 months prior to the allocated implementation Outage, the *Employer* performs a readiness review and if the *Contractor* is proven to not be ready in terms of KLA-023 [99], the *Employer* has the right to allocate the work to another outage, with no cost impact to the *Employer*.

The *Project Manager*, in conjunction with the *Employer* holds a readiness review to assess the *Contractor's* overall readiness to implement the *works*.

Specific items that form part of this review includes (but are not limited to):

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- Documentation (design, site implementation file acceptance)
- Planning (detailed planning including resources and working times)
- Resources (qualification, training plan and mobilisation progress)
- Plant and Materials (delivered to Site and accepted/receipt inspected)
- Safety (risk assessments, mitigation and prevention, construction regulations)

Should the review conclude that the *Contractor* has substantially failed to meet the required Key Dates or have failed to take subsequent corrective action to demonstrate a high level of confidence in terms of its readiness to implement the *works*, the *Employer* retains the right to reschedule the implementation of the *works* to the next opportune outage with no additional compensation due, by the *Employer*. It is hence critical that the *Contractor* ensures that Key Dates as stated in the Contract Data are adhered to and where deviations exist, that effective corrective action is taken to resolve any issue/delay.

2.8.1.3 Planner requirements

The *Contractor's* planner is a key person, and his name is included in the Contract Data – Part Two, data provided by the *Contractor*. This key person must have intimate knowledge of ECC Core Clause 3 and specifically the requirements as set out in ECC Core Clause 31.2.

2.8.1.4 Monthly progress reporting

The *Contractor* submits to the Project Manager a monthly report following the assessment date, but by no than the last day of each month. The report contains the following information as a minimum requirement:

- Executive summary. (Narrative identifying major movement within the reporting period.)
- Revised programme in paper and software copy (.pdf and .xer file format) for *Project Manager's* acceptance indicating, actual progress of work against last Accepted Programme.
- Updated "List of Applicable Documents" which is a list (table) indicating the "current accepted" revision as well as the status of any later revisions of documents considered key in the control of Providing the Works and include the following as a minimum:
 - Contract Quality Management Plan
 - Scheme Design
 - Installation Design
 - Work Plan
 - Test Procedures
 - Safety Evaluation (Screening/Evaluation/Justification)
 - Safety Case
- List of Activities which:
 - were completed during current reporting period per discipline, (including the activities of the *Employer* and Others).
 - are in progress.
 - activities of the *Employer* and Others.
 - are to be undertaken during the next reporting period per discipline, including the activities of the *Employer* and Others.
 - are behind schedule together with an action plan on how the delays are to be rectified.
- A schedule of all material procurement activities, including time for fabrication and delivery of manufactured products. The interdependence of procurement and construction activities is included in the schedule.
- Proposed monthly assessment information which is based on the list of activities that were completed during the current reporting period.
- Revised activity schedule which indicates projected future cashflow
- Key issues / Items of concern and corrective actions.

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- Progress curves
- Early warning log
- Compensation event log
- Critical activities

2.8.1.5 Outage control / work control interface

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Provision of <i>Employer</i> outage schedule	X		<ul style="list-style-type: none"> • The <i>Employer's</i> outage schedule indicates sufficient detail for the <i>Contractor</i> to effectively determine installation windows for various modifications and/or phases of modifications. 	In accordance with Accepted Programme	Provision of <i>Employer</i> outage schedule
Modification isolation plan / requirements and determination of relevant implementation window(s).		X	<ul style="list-style-type: none"> • The <i>Contractor</i> provides the required information and supports the <i>Supervisor</i> with interfaces to OCC / work control and operations. 	In accordance with Accepted Programme	
Modification implementation schedule (including testing).		X	<ul style="list-style-type: none"> • For high priority work, the planning requirements for implementation are agreed outside the requirements of KLA-023, KAA-501 and KAA-721. 	In accordance with KLA-023 and KAA-721.	KLA-023: Outage works. KAA-721: non-outage works – including pre-outage works.
Inclusion of implementation schedule in overall outage schedule / weekly plan.	X		<ul style="list-style-type: none"> • Physical linking and inclusion into overall outage schedule / production plan. 	In accordance with Accepted Programme	
Verification of implementation schedule in overall outage schedule / weekly plan.		X	<ul style="list-style-type: none"> • The <i>Contractor</i> verifies and confirms that the outage schedule / weekly plan is correct. 	In accordance with Accepted Programme	
Modification documentation release plan		X	<ul style="list-style-type: none"> • The <i>Contractor</i> compiles the document release plan. For a single modification, this is the document in the DCIF indicating when the documents are to be released during the modification implementation. • In exceptional cases it may be required to create temporary operating instructions (TOIs), etc. until all other modifications on the system are completed and the system procedure is released. • The document release plan shall indicate and reference all TOI's, and other strategies implemented to ensure that the operators always have correctly updated information in the control room. For TOIs, this service is supplied by the <i>Employer's</i> OPG group. • It is the <i>Contractor's</i> responsibility to provide inputs and assistance in 	In accordance with Accepted Programme	<i>Contractor</i> shall identify TOIs. TOIs to be managed by the <i>Employer</i> .

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
			assuring that the document release plan is realistic and up to date.		
Permit to work (PTW's) and sanction for test (SFT) and test applications (TA).		X	<ul style="list-style-type: none"> The request is completed by a responsible person (RP), supplied by the <i>Contractor</i> in accordance with <i>Employer's</i> plant safety regulation (PSR) procedures. Permit to Work and Sanction for Test requests needs to be raised on the <i>Employer's</i> PTW system. Isolation plans are referenced in the PTW request. PTW are raised in accordance with <i>Employer</i> procedure KAA-667 	In accordance with Accepted Programme	A responsible person in terms of the OH&S Act is authorised to take out PTW's and SFT's to perform/supervise work and tests on the <i>Employer's</i> plant.
Management and scheduling of interfaces between outage control centre (OCC) / work control (WC) and the <i>Contractor</i> .	X		<ul style="list-style-type: none"> The <i>Contractor</i> provides the implementation planning. The <i>Employer</i> integrates the planning in the overall outage schedule. The <i>Contractor</i> supports the <i>Employer</i>. Interface in liaison with the <i>Project Manager</i>. 	As required	Planning as per KLA-023 and KAA-721 are regarded as fixed (ruling timeline).
Notification to <i>Contractor</i> of any changes to schedule.	X		<ul style="list-style-type: none"> The <i>Employer</i> notifies the <i>Contractor</i> of any changes to the implementation schedule due to the <i>Employer</i> activities. 	As required	
Outage meeting / production meeting progress feedback.	X		<ul style="list-style-type: none"> During planning stage of project, the <i>Contractor</i> must be available to support the <i>Project Manager</i> during feedback at these meetings. Where required the <i>Contractor</i> attends the meetings. 	As required	The meetings are held weekly.
Daily outage / production feedback during implementation and problem resolution.	X		<ul style="list-style-type: none"> During installation and testing the <i>Contractor</i> is available to support the <i>Project Manager</i> during feedback at daily outage and production feedback meetings. Where required the <i>Contractor</i> attends the meetings. 	As required	
Conclusion	X	X	<ul style="list-style-type: none"> This activity group is part of the management function provided by the <i>Contractor</i> and extends over the duration of the project until Completion of the whole of the <i>works</i>. 	In accordance with Accepted Programme	Deliverable: <ul style="list-style-type: none"> Detailed modification implementation schedules (integrated with OCC plans) Documentation Release Plan Permit to Work and Sanction for Test Applications.

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2.8.1.6 General

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Site organisation chart and roster (<i>Contractor</i>)		X	<ul style="list-style-type: none"> Names, Main Responsibilities, Telephone numbers / Pagers / Mobile 	In accordance with Accepted Programme	
Support activities chart and roster		X	<ul style="list-style-type: none"> Names, Main Responsibilities, Telephone numbers / Pagers / Mobile 	In accordance with Accepted Programme	
Site representatives' chart and roster (<i>Employer</i>)	X		<ul style="list-style-type: none"> Names, Main Responsibilities, Telephone numbers / Pagers / Mobile 	In accordance with Accepted Programme	
Kick-off meeting Implementation (Outage / non-outage)	X		<ul style="list-style-type: none"> The <i>Project Manager</i> arranges the meeting; the <i>Contractor</i> ensures that relevant personnel of the Site implementation team as well as project management team are present at the meeting. The venue for the meeting is on Site. 	In accordance with Accepted Programme	
List of <i>Contractor's</i> Sub- <i>Contractors</i>		X	<ul style="list-style-type: none"> To be supplied to <i>Project Manager</i> for <i>Employer's</i> PQA representative approval. 	Minimum 8wks prior to start.	
List of Applicable Documents for Outage Implementation		X	<ul style="list-style-type: none"> The List of Applicable Documents summarises the documentation to be used as reference during the implementation and testing phase of the modification. 	In accordance with Accepted Programme	
Acceptance of vehicle access to Site	X		<ul style="list-style-type: none"> Permission for access of a vehicle on the Site must be obtained from the <i>Project Manager</i> Vehicles are not allowed on Site unless specific approval is obtained from the <i>Employer</i> and shall only be considered for exceptional cases. 	As required	
Site access permit applications		X	<ul style="list-style-type: none"> <i>Contractor</i> to complete forms himself. 	As required	
Site access authorisation	X		At completion of all required access training.	5 days duration	
Arranging training and related competency tests / assessments.		X	<ul style="list-style-type: none"> Booking by <i>Contractor</i> - to fit in with normal routine course or <i>Contractor</i> to arrange a separate course for large number of people. <i>Employer</i> requirements relating to training of personnel are detailed in KSA-119 (As required	
Provide training and related competency tests/assessments.	X			As required	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Qualification and authorisation verification of all personnel to perform construction work for the <i>Contractor</i> for the works.		X	<ul style="list-style-type: none"> • In accordance with the <i>Contractor's</i> quality procedures and: • for performing welding activities, the <i>Contractor</i> ensures that all its welders comply with the requirements of KNM-001 (• for performing non-destructive testing, the <i>Contractor</i> ensures that all its personnel are qualified in compliance with the requirements of KSA-037 • for performing scaffolding works, the <i>Contractor</i> ensures that all its personnel are qualified in compliance with the requirements of KSM-031 • for performing rigging works, the <i>Contractor</i> ensures that all its personnel are qualified in compliance with the requirements of KSA-132; and • for performing lagging works, the <i>Contractor</i> ensures that all its personnel are qualified in compliance with the requirements of KSM-032 	As required	
Checks for Sub-Contractors agreement		X		As required	
Calibration of equipment	X		<ul style="list-style-type: none"> • Where the <i>Employer</i> is required to calibrate equipment, the <i>Contractor</i> ensures that: • SAP orders are raised for the <i>Employer</i> to perform the calibrations. These SAP orders specifies in detail all the relevant calibration requirements. • Equipment for calibration is supplied to the <i>Project Manager</i> at 3 months prior to start of the refuelling outage / implementation (for non-outage modifications) 	To-3 months	To = Start of refuelling outage / implementation window.
Conclusion	X	X	<ul style="list-style-type: none"> • This activity group is part of the management function provided by the <i>Contractor</i> and extends over the duration of the project until completion of the whole of the works. 	In accordance with Accepted Programme	Deliverable: <ul style="list-style-type: none"> • Site Organisational Chart [Implementation] • List of Sub Contractors • List of applicable documents • Office requirements • Records of authorised personnel involved with construction.

2.9 Contractor's management, supervision, and key people

2.9.1 People restrictions on Site; hours of work, conduct and records.

2.9.1.1 People

The *Employer's* standard for management and control of supplemental workers at KOU is document in KSA-119 Rev 2.

The *Contractor* employs in and about the Provision of the Works only such persons that are careful, competent and efficient in their several trades and callings, to achieve nuclear safety, and the *Employer* reserves the right to object to and require the *Contractor* to remove from the *works*, forthwith, any person employed by the *Contractor* in or about the Provision of the Works who, in the opinion of the *Project Manager*, misconduct's himself or is incompetent or negligent in the proper performance of his duties and such person is not again employed for the *works* without the written permission of the *Project Manager*.

The *Contractor*, in and about the Provision of the Works, provides evidence of skills assessment (including qualifications) for all its staff. *Contractor* project manager, QC and supervisors are required to present SAQA approved certificates (or equivalent), for the position that they fulfil. The *Contractor's* project manager is trained on the NEC ECC3 prior the *access date*. Any personnel that do not meet the panel requirements shall have their access to site revoked.

The *Contractor* ensures that the *Contractor's* employees are reasonably fluent in the language of the contract.

The *Contractor* always maintains a harmonious relationship with and co-operates with the *Employer* and all its suppliers and sub-suppliers or their employees who may be involved.

All radiation workers comply with such radiation protection standards as is required by the *Employer*.

2.9.1.2 Supervision

South African Construction Regulations require the *Contractor* to appoint a full-time competent employee to supervise the performance of construction work. The *Contractor* (as principal *contractor* in terms of the OHS Act Construction Regulations) therefore appoints, in writing, a competent full time construction supervisor and where required an assistant supervisor, clearly stipulating all duties relating to the supervision of the project.

The *Contractor's* construction supervisor must be registered as a professional construction manager in terms of the Project and Construction Management Act, 48 of 2000

The *Contractor* may appoint additional people (assistant construction supervisor) to assist the construction supervisor to perform certain of his functions, but this does not relieve the construction supervisor of his or her responsibilities under the regulations. If the *Contractor* has not appointed additional people to assist the construction supervisor, and an inspector determines that the construction supervisor needs assistance, he can instruct the *Contractor* to do so, at no additional cost to the *Employer*.

No work may be performed, by the *Contractor*, unless in the presence of the *Contractor's* construction supervisor or assistant construction supervisor.

The *Contractor's* construction supervisor and assistant construction supervisor shall be fully conversant with the contents of the *Contractor's* health and safety plan including the following and shall stop any or all work which is not in line with these provisions:

- Risk assessments,
- Method statements, and
- Fall protection plan.

2.9.1.3 Construction health and safety practitioners

The *Contractor's* construction health and safety agent (as a specified category in terms of section 18 (1) (c) of the Project and Construction Management Professions Act No. 48 of 2000) is appointed to ensure that the *Contractor* complies with its statutory duties under the Occupational Health and Safety Act (Act No. 85 of 1993) and applicable regulations such as the Construction Regulation, etc.

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2.9.1.4 The Contractor's designer

All engineering work is performed by suitably qualified and experienced individuals. The *Contractor's* design engineer, the seismic analyst as well as the independent reviewer(s) must be registered as professional engineers (in terms of Engineering Profession Act No.46 of 2000) with the Engineering Council of South Africa (or equivalent international body).

The *Contractor's* designer:

- (a) must take steps to ensure that the applicable requirements of the Works Information and the National Regulations are complied with in the design.
- (b) must perform all actions, including site visits, to ensure dangers or hazards and as found conditions and installation constraints, relating to the *works*, are identified. Where sections of the site are inaccessible for inspection, this must be stated in his design, with the resultant assumptions / constraints.
- (c) must take into consideration the health and safety specification submitted by the *Employer*, as well as the applicable legislation and regulations related to the *works*.
- (d) must make available to the *Employer* all relevant health and safety information about the design.
- (e) must inform the *Supervisor* and the *Contractor's* personnel, in writing, of any known or anticipated dangers or hazards relating to the *works* and make available all relevant information required for the safe execution of the *works* upon being designed or when the design is subsequently altered.
- (f) must follow the requirements of the nuclear design standard for Koeberg Nuclear Power Station (Ref: KSU-008), applicable to all on-site plant systems, structures and components and off-site plant systems, structures and components that affect the safe and reliable operation of Koeberg Nuclear Power Station.
- (g) must compile the design in accordance with 331-86 (Design to Plant, Plant Structures or Operating Parameters)
- (h) must, subject to the provisions of paragraphs (a) and (c), ensure that the following information is included in a report and made available to the *Supervisor* and the *Contractor's* personnel:
 - For civil works:
 - A geo-science technical report where appropriate.
 - the loading that the structure is designed to withstand; and
 - the methods and sequence of construction process.
 - For mechanical works:
 - Service or maintenance manual(s).
 - Finite element analysis
 - Stress analysis report indicating material strength and code/specifications; and
 - the methods and sequence of construction process.
 - For electrical / control and instrumentation works:
 - Service or maintenance manual(s).
 - PID drawings.
 - Wiring diagrams; and
 - the methods and sequence of construction process.
- (i) may not include anything in the design necessitating the use of dangerous procedures or materials hazardous to the health and safety of persons, which can be avoided by modifying the design or by substituting materials.
- (j) must consider the hazards relating to any subsequent maintenance of the relevant *works* and must make provision in the design for that work to be performed to minimise the risk.
- (k) must, carry out the necessary inspections at appropriate stages to verify that the construction of the relevant design is carried out in accordance with his design.

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- (l) must when mandated by the *Contractor* to stop the *Contractor* from executing any construction work which is not in accordance with the relevant design's technical, health and safety aspects.
- (m) must in his or her final inspection of the completed *works* in accordance with the National Regulations include the health and safety aspects of the *works* and declare the *works* safe for use, prior to the *Project Manager* issuing the Completion; and
- (n) must ensure that during design process, cognisance is taken of ergonomic design principles to minimise ergonomic related hazards in all phases of the life cycle of a *works*.

2.9.1.5 Key personnel

The *Contractor* ensures that all key personnel requiring access to Site meet the requirements of the *Employer's* security and medical qualifications as well as training and experience generally required by similar utilities elsewhere in respect of similar work. Where required, these staff members also meet such requirements as the National Nuclear Regulator may stipulate from time to time.

The *Contractor* provides orientation and technical training for all key personnel requiring access to Site in accordance with the requirements of the *Employer's* Radiological Safety Regulations, the *Employer's* Industrial Safety Programme, and, in general, the whole framework of plant rules (as applicable) and regulations which may be in force at the *Employer's* Site from time to time, which is available on request.

The following are considered key persons by the *Employer* and the *Contractor* submits a brief CV with associated records of qualification and related experience at the Contract Date:

- *Contractor's* project manager
- *Contractor's* planner
- Design engineer
- Construction and installation supervisor(s)
- Quality Management representative
- Quality control inspector(s)
- Health and safety representative

2.9.1.6 Emergency mustering, accountability, and evacuation

Due to the nature of the Site, the *Contractor* shall always have full accountability of all his/her personnel. The *Contractor* shall maintain an updated status and accountability list of all his personnel on Site (the areas associated with the *works*, within the boundaries of Access Control Point 2 (ACP 2) at Nuclear Operating Unit 1). The updated and status and accountability list is handed to the *Project Manager* each time a change occurs.

The *Contractor* ensures that his site representative takes full responsibility for requirement and that the *Contractor* and his personnel are fully conversant with the mustering requirements as detailed in the *Employer's* procedure KAA-611 Revision 5.

2.9.1.7 Site hours

2.9.1.7.1 Non shift staff.

Employer working hours are 24 hours a day, 7 days a week during outage periods.

Normal working hours during non-outage periods are:

Mon-Thu: 07h30 – 16h35

Fri: 07h30 – 13h35

On the last Friday of each month however, working hours shall be from 7h30 until 12h00.

2.9.1.7.2 Shift staff:

In accordance with official, approved shift rosters.

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2.9.1.7.3 Flexitime

Employer's employees who have a written agreement entitling them to work flexitime, the "Core Time" during which time cannot be flexed is from 09h00 to 15h00, whilst no employee may flex prior to 06h00 (Monday to Friday) nor after 18h00 (Monday to Thursday).

The *Contractor* takes due cognisance of the *Employer's* working hours whilst Providing the Works and performs regular reporting of person hours worked monthly to the *Project Manager*.

2.10 Invoicing and payment

Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice showing the amount due for payment equal to that stated in the *Project Manager's* payment certificate.

The *Contractor* shall address the tax invoice to Eskom Holdings SOC Ltd and include on each invoice the following information:

- Name and address of the *Contractor* and the *Project Manager*.
- The contract number and title.
- *Contractor's* VAT registration number.
- The *Employer's* VAT registration number 4740101508.
- Description of service provided for each item invoiced based on the Price List.
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT.
- (Add other as required)

Add procedures for invoice submission and payment (e. g. electronic payment instructions)

2.10.1 Assessments

The *Contractor* includes in the Monthly Planning Report the proposed assessment information. Failure to submit such information on the assessment date shall result in the *Project Manager* making his own assessment, based on available information.

The *Contractor* submits, separately, all documentation and certification in support of the proposed assessment information.

2.10.2 Invoices and payment arrangements

The *Contractor* ensures that the requirement in terms of Section 20(4)(C) of the Value Added Tax Act 89 of 1991 as amended by the Revenue Laws Amendment Act 45 of 2003, that the VAT registration number of the recipient of the tax invoice, appears on the said tax invoice in order for the invoice to fully comply with the requirements of a valid invoice for VAT purposes as contained in the said Section 10(4)(C), is adhered to. No payment shall be made on tax invoices not fully meeting this requirement.

- **All invoices are marked for the attention of:**

The Accounts Payable Section
Koeberg Operating Unit
Private Bag X10
Kernkrag 7440
South Africa

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• Particulars to be included on the Contractor's Tax Invoice:

- The name and address of the *Contractor*
- The date of the invoice
- An invoice number.
- *Contractor's* VAT registration number (if applicable)
- *Employer's* VAT registration number
- Reference to Contract and/or SAP Task Order number
- The amount paid to date.
- The price adjustment for inflation (where clause X1 is applicable)
- The value of the invoice split into payments as per the *activity schedule*.
- A descriptive title of the service covered by the Invoice and/or the Contract's assessment number.

To enable payment against each applicable SAP generated Task Order the *Project Manager* and the *Contractor* must sign next to each line acceptance of the service, Plant and Materials or goods delivered on the applicable SAP generated Task Order. The signed copy of this SAP generated Task Order is promptly returned to the *Project Manager*.

Payment is made by means of electronic transfer. The *Contractor* therefore provides his banking details to the *Project Manager* within one week of the Contract Date.

2.10.2.1 Compensation events**2.10.2.2 Concurrent delay**

If the *Contractor* incurs additional costs that are caused both by *Employer* delay and concurrent *Contractor* delay, then the *Contractor* may only recover compensation to the extent the *Contractor* is able to separately identify the additional costs caused by the *Employer* delay from those caused by the *Contractor* delay. If the *Contractor* would have incurred the additional costs in any event because of *Contractor* delays, the *Contractor* is not entitled to recover those additional costs.

2.10.2.3 Mitigation of delay

The *Contractor* has a duty to mitigate the effect, of *Employer* risk events, on the *works* and the *Contractor* does all it reasonably can to avoid an impact on the Prices. The duty to mitigate does not extend to the *Contractor* to adding extra resources or to work outside its planned working hours.

2.10.2.4 Notification of Compensation Event

When a Compensation Event is notified, the *Contractor* must provide sufficient and sufficiently detailed information illustrating the exact or near to exact impact the Compensation Event has or shall have on the *Contractor*, to enable the *Project Manager* to assess whether to call for a quotation or not. Adding to this the *Contractor* must state which Compensation event under NEC3 ECC Clause 60.1 he believes it to be.

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2.10.2.5 Quotation

A quotation is an assessment of the cost entitlement of a valid Compensation Event claim and a consequence of the *Project Manager* having agreed that the event is a Compensation Event.

The *Contractor* provides quotations for compensation events detailing the following items as a minimum:

- Introduction
- Executive summary
- Contractual basis of compensation event (Refer to ECC Core Clause 60.1)
- Details of the compensation event
- Assessment of compensation event (ECC Core Clause 63)
- Conclusion
- Accepted programme showing impact of delay ((ECC Core Clause 62.2) – If the programme for remaining work is altered by the Compensation Event
- Appendices:
 - Early Warning (ECC Core Clause 16.1) - if applicable
 - Notification (ECC Core Clause 61.3)
 - Instruction to submit quotation (ECC Core Clause 61.1 or 61.2)
 - Instruction to submit alternative quotation (ECC Core Clause 62.1) or to submit a revised quotation (ECC Core Clause 62.4) - if applicable
 - Any extension of time under (ECC Core Clause 62.5) - if applicable
 - Any other document(s) the *Contractor* may consider applicable.

For compensation events to be implemented, the *Employer* requires the *Contractor* to sign a compensation event register form. For any payments required because of the compensation event, the *Contractor* is required to submit the signed compensation event register form, at latest, prior to the 15th of the month in which any associated amount should be assessed. This is to allow sufficient time for the *Employer* to load the associated costs onto its SAP system.

It is specifically stated that the *Employer* shall not accept any forecasted payments relating to “compensation event acceptance”.

2.10.2.6 Verification

The contract is administered in a spirit of mutual trust and co-operation (see ECC Core Clause 10.1). To this end the *Contractor* should collaborate, with the *Project Manager*, through all stages of the assessment and verification of Defined Costs. This contract requires that the *Contractor* keep financial, project and other records and accounts. The *Contractor* also provides the *Employer*, the *Project Manager*, and their delegates with the right to carry out audits and verify that the payments of Defined Cost are fully supported by those records and accounts to ensure that the *Contractor* fulfils its obligations under the contract. The requirement for access thereto is passed down to Subcontractors as appropriate and where relevant. This is one of the requirements for acceptance of Subcontractors.

2.11 Insurance provided by the *Employer*.

Insurance shall be applicable as per applicable insurance reference and clauses in the Contract Data.

2.12 Contract change management.

The *Contractor* is responsible to document and resolve any required changes on his design/equipment. The approval process indicated in this Works Information is adhered to, by the *Contractor*.

2.13 Provision of bonds and guarantees.

The form in which a bond or guarantee required by the *conditions of contract* (if any) is to be provided by the *Contractor* is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

The *Employer* may withhold payment of amounts due to the *Contractor* until the bond or guarantee required in terms of this contract has been received and accepted by the person notified to the *Contractor* by the *Project Manager* to receive and accept such bond or guarantee. Such withholding of payment due to the *Contractor* does not affect the *Employer's* right to termination stated in this contract.

2.14 Records of Defined Cost, payments & assessments of compensation events to be kept by the Contractor.

The *Contractor* keeps all records, for presentation to the *Project Manager*, for compensation events.

2.15 Training workshops and technology transfer

Operational, Maintenance, and Engineering training is to be provided in accordance with the requirements stated below:

2.15.1 Transfer of skills to the Employer's personnel

The *Contractor* assists the *Employer* in the skills development of the *Employer's* personnel by accommodating such personnel, as mutually agreed, in the offices of the *Contractor* for the purposes of gaining an understanding of the system/technology.

If in the opinion of the *Contractor* the existing skills of the *Employer's* personnel can be utilised to the benefit of the contract, this can be mutually arranged. Additional costs shall be for acceptance by the *Project Manager* prior to it being incurred, as part of the ECC Compensation event procedure.

2.15.2 Training Requirements

- Discipline specific training shall be provided by *Contractor* for the *Employer* personnel responsible for the operation and maintenance of the equipment that shall include at least two persons from the following groups: Maintenance, Systems Engineering, Civil Engineering, Operating Training, and Design Engineering.
- Training supplied by the *Contractor* shall include:
 - Design principles,
 - Equipment selection criteria when designing the System,
 - System overview,
 - System functionality,
 - Operating parameters,
 - Monitoring parameters,
 - Fault finding,
 - Operation, testing and requalification of the system,
 - Alarm interpretation,
 - Maintenance procedures
 - Analysis methods of recordings
 - System reset and
 - Optimal versus non-optimal setting up of the System.
- The *Employer* shall provide a list of names of the trainees on request from the *Contractor*.
- Furthermore, the *Employer* shall provide a classroom or other suitable medium for the purposes of the training.

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2.15.3 Training: operators, maintenance, and engineering

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Provision of specific system / component training material (i.e., should the <i>Contractor</i> provide training on the system, the training material is included in the scope of supply) and completion of the Training Change Request.		X	<ul style="list-style-type: none"> • Training Change Requests (TCRs) are compiled in accordance with KAA-959. • <i>Contractor's</i> training material is provided with the TCR. 	In accordance with Accepted Programme	Notification to be made by official communication. <i>Employer</i> to follow own process for TCRs.
Submittal of TCR to TMG	X		<ul style="list-style-type: none"> • Operations and maintenance training initial impact assessment performed by the Training Management Group (TMG) 	In accordance with Accepted Programme	
Interface with operating and maintenance teams	X		<ul style="list-style-type: none"> • The <i>Project Manager</i> arranges the training 	As required	
Training on nonstandard / new components / systems to KOU		X	<ul style="list-style-type: none"> • Where training is required for nonstandard components, the <i>Contractor</i> provides a resource (on Site) to perform a once-off specialised training course to the Operations, Maintenance as well as Engineering personnel. • The training is performed to a level where at least one <i>Employer's</i> team, consisting of 5 individuals, is capable to adequately maintain and operate the new component / system. • Training of maintenance personnel is completed prior to completion of <i>works</i> installation. • Training of operations personnel is completed prior to start of implementation. • Training of engineering personnel is completed prior to start of implementation. 	6 weeks prior to the start of the outage unless otherwise agreed.	Normally, operator training is performed during the training weeks of each shift and therefore shall take at least six weeks to complete (there are six shifts).
Conclusion	X	X	<ul style="list-style-type: none"> • This activity is complete once the <i>Employer's</i> Training Management Group issued a letter to the <i>Project Manager</i> confirming that training is completed. 	In accordance with Accepted Programme	Deliverables: <ul style="list-style-type: none"> • Training Change Request (TCR) • Training material for nonstandard / new components to KOU

3 Engineering and the *Contractor's* design

The *Contractor* complies with all the requirements of the *Employer's* works information. For all designs required by the *works*, the *Contractor* complies with the *Employer's* procedure 331-86 [21]. The *Contractor* also complies with the requirements of RD-0034 [131] and the NNR position paper PP-0012 [127].

3.1 *Employer's* design

The *Employer* shall not be performing the design as this is included as part of the *Contractor's* scope for *works*, referring to section 3.4 of the *Employer's* works information

3.2 Nuclear safety

Contractor adherence to appropriate national and international standards in the design, construction, operation, and decommissioning, as part of the *works*, is necessary for the successful implementation of the *Employer's* nuclear safety requirements.

The *Contractor* critically assesses the standards specified, by the *Employer*, to assure that they remain consistent with the latest information arising from operational experience and developments in science and engineering. Where specified standards do not suffice, an appropriate nuclear safety standard is proposed to the *Project Manager*, for acceptance.

3.3 Parts of the *works* which the *Contractor* is to design.

The design requirements are based on eliminating the current obsolescence from the existing KIS system, and therefore the functionality is primarily the same as the current system. A description of the existing installation, equipment and functionality is provided in of the *Employer's* works information section 1 (Description of the works).

3.3.1 Environmental Conditions

The KIS System shall remain operational during all plant operating states.

The centralised recording and analysing seismic equipment shall be installed in Room L609, Electrical building Unit 1.

The seismic sensors are installed in various locations within the plant. Refer to Figure 1-1: Existing KIS System Layout.

The Angular Position and Linear Displacement sensors are installed within the seismic vault next to columns R1 and R28.

An additional seismic sensor shall be installed at the CSB to record the seismic activity where the fuel casks are stored.

3.3.1.1 Centralised Recording and Analysing Seismic Equipment:

- **Normal Operating Conditions** [45]

Radiation:	Background
Pressure:	Atmospheric
Temperature:	20°C to 24°C
Relative humidity:	45% to 55%

(NB: Total loss of ventilation function results in a slow temperature rise of 5°C/hr under worst conditions)
- **During and After Seismic Event** [138]

The equipment is required to operate during and after a seismic event but not under nuclear accident conditions.

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3.3.1.2 Seismic Monitoring Sensors

- **Radiological Environment (for sensor with highest exposure)**

- **Normal Operating Conditions**

[46][47][52]

Radiation: Yellow (>25 µSvh & <1000 µSvh)

Pressure: Atmospheric

Temperature: 15°C to 55°C

Relative humidity: 15% to 95%

- **During and After Seismic Event**

[138]

The equipment is required to operate during and after a seismic event but not under nuclear accident conditions.

- **Marine Environment**

- **Normal Operating Conditions**

[121]

Radiation: Background

Pressure: Atmospheric

Temperature: 2°C to 40°C

Relative humidity: 74% to 92%

NB: This is a highly corrosive environment.

- **During and After Seismic Event**

[138]

The equipment is required to operate during and after a seismic event but not under nuclear accident conditions.

3.3.1.3 Angular Position and Linear Displacement Sensors (raft)

- **Normal Operating Conditions**

[32]

Radiation: Background

Pressure: Atmospheric

Temperature: 12°C to 25°C

Relative humidity: 30% to 82%

- **During and After Seismic Event**

[138]

The equipment is required to operate during and after a seismic event but not under nuclear accident conditions.

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3.3.2 Classification**3.3.2.1 Component Classification**

Trigramme	Item Description	Classification number	Safety Class	Seismic Class	Quality Level	Environmental Category	Importance Class
1KIS001AR	Seismic Instrumentation Cabinet	I0015/21C	NSF	1A	Q3	0	SR
1KIS001LZ	Peak Accelerometer	I0015/21C	NSF	1A	Q3	0	SR
1KIS001MZ	Triaxial Accelerometer	I0015/21C	NSF	1A	Q3	0	SR
1KIS002AR	Seismic Instrumentation Cabinet	I0015/21C	NSF	1A	Q3	0	SR
1KIS002LZ	Peak Accelerometer	I0015/21C	NSF	1A	Q3	0	SR
1KIS002MZ	Triaxial Accelerometer	I0015/21C	NSF	1A	Q3	0	SR
1KIS003LZ	Peak Accelerometer	I0015/21C	NSF	1A	Q3	1	SR
1KIS003MZ	Triaxial Accelerometer	I0015/21C	NSF	1A	Q3	0	SR
1KIS004LZ	Peak Accelerometer	I0015/21C	NSF	1A	Q3	1	SR
1KIS004MZ	Triaxial Accelerometer	I0015/21C	NSF	1A	Q3	1	SR
1KIS005LZ	Peak Accelerometer	I0015/21C	NSF	1A	Q3	0	SR
1KIS005MZ	Triaxial Accelerometer	I0015/21C	NSF	1A	Q3	1	SR
1KIS006LZ	Peak Accelerometer	I0015/21C	NSF	1A	Q3	0	SR
1KIS006MZ	Triaxial Accelerometer	I0015/21C	NSF	1A	Q3	0	SR
1KIS007LZ	Peak Accelerometer	I0015/21C	NSF	1A	Q3	0	SR
1KIS007MZ	Response Spectrum Recorder	I0015/21C	NSF	1A	Q3	0	SR
1KIS008LZ	Peak Accelerometer	I0015/21C	NSF	1A	Q3	0	SR
1KIS008MZ	Signal Conditioning Module	I0015/21C	NSF	1A	Q3	0	SR
1KIS009LZ	Response Spectrum Recorder	I0015/21C	NSF	1A	Q3	1	SR
1KIS009MZ	Linear Displacement Sensor	I0015/21C	NSF	1A	Q3	0	SR
1KIS010LZ	Response Spectrum Recorder	I0015/21C	NSF	1A	Q3	0	SR
1KIS010MZ	Linear Displacement Sensor	I0015/21C	NSF	1A	Q3	0	SR
1KIS011LZ	Response Spectrum Recorder	I0015/21C	NSF	1A	Q3	0	SR
1KIS011MZ	Angular Position Sensor	I0015/21C	NSF	1A	Q3	0	SR
1KIS012MZ	Angular Position Sensor	I0015/21C	NSF	1A	Q3	0	SR

3.3.2.2 Parts Classification

Trigramme	Item Description	Classification number	Safety Class	Seismic Class	Quality Level	Environmental Category
1KIS001AR	Electronic parts	I0016/21C	NSF	1	Q4	0
1KIS001LZ	Magnetic tape clips-KIS 001,002,005,006,007&008 LZ)	I0016/21C	NSF	1	Q4	0
1KIS002AR	Electronic parts	I0016/21C	NSF	1	Q4	0
1KIS003LZ	Magnetic tape clips-KIS 003 LZ and KIS 004 LZ	I0016/21C	NSF	1	Q4	1

3.3.2.3 Software Classification

Software	Classification number	Safety Class	Quality Level	Importance Class
KIS 001/002 AR	S0012/021C	NSF	Q3	NSA

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3.3.2.4 Design Engineering Service Classification

Services	Classification number	Quality Level	Importance Class	RD-0034 Level
Design service	D0017/21C	Q3	SR	L2

3.3.3 General Requirements

- The *Contractor* shall provide a detailed design for the KIS System at KNPS, in accordance with KNPS procedure 331-86 [21].
- The KIS system shall comply with nuclear industry regulations USNRC RG 1.12 [119], IEEE 344 [55] and ANSI/ANS 2.2 [35].
- The design shall describe the concept design, supply, installation, testing and commissioning aspects of the modified systems and shall be on the prescribed *Employer* template.
- The KIS System shall comply with all the requirements of the *Employer's* works information and all documents listed in the *Employer's* works information section 8.
- The KIS system shall be seismically qualified and shall envelope the seismic qualification of the plant (see DSG-318-033 [43] and 240-121010217 [4]).
- The KIS system sensors shall be physical protected against external factors such as bumping, flooding etc.
- As a minimum, the equipment and components specified herein shall be designed and manufactured in accordance with the edition and addenda of the codes, standards, and regulations identified in the *Employer's* works information. The *Contractor* shall not adopt case rulings, code interpretations, or exceptions to requirements listed in the referenced standards unless authorized by the *Employer*.
- The requirements of the *Employer's* works information shall take precedence if they are more stringent than the requirements specified in the codes, standards, and regulations.
- The modification shall not introduce additional risks to personnel or plant integrity. The requirements of the Occupational Health and Safety Act (85 of 1993) [124] and the *Employer's* lifesaving rules shall be always complied with by the *Contractor's* staff.
- If any conflict arises between this *Employer's* works information and other referenced documents, the *Contractor* shall not proceed and request clarification, in writing, from the *Employer*.
- Initial design drawings shall be submitted for review and acceptance by the *Employer* as part of the design. Manufacturing shall not proceed before these drawings are accepted.
- A complete set of post manufacturing "as built" drawings shall be provided by the *Contractor* as part of the QADP.
- The *Contractor* shall verify, by performing a detailed plant walk down before using the information, that the existing documentation represent the actual plant design layout. Any deviation shall be reported to the *Employer*. Inconsistencies shall be corrected through a revision of the documentation by the *Contractor*.
- P&IDs shall be comprehensively updated or new drawings with unique identifiers shall be issued by the *Contractor* to the *Employer* on the prescribed drawing template.
- In the interests of maintaining a safe working environment, installed equipment should be chosen to minimise employee's exposure to noise. Installed equipment should produce noise levels less than 85 dB(A). Where it is impractical to do so, control measures should be designed to reduce such noise levels to below 85 dB (A).
- To simplify spares holding and staff training requirements, any new equipment introduced to the power plant should as far as possible be standardised with existing equipment. Lists of existing plant equipment that may relate to this modification are available from the *Employer* on request.
- The *Contractor's* Scope includes the work and services which, although it may not be expressly noted herein, can reasonably be inferred from the *Employer's* works information, the only exclusion being that which are specifically stated to be excluded or otherwise to be provided by the *Employer* or Others.

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- The new KIS system shall use the latest technology that has a proven track record and is in line with the latest international trends. In addition, the new system should provide system enhancements and utilise operating practices that promote:
 - General ease-of-use
 - History of system interventions and alarm fault logging
 - Security levels to prevent unauthorised setting changes.
 - Testing and calibration functions
 - Indication of the inhibited or faulted channels
 - Continuous system health monitoring
 - Self-fault diagnostic capability
- All equipment installed shall have a 40-year life supported by the supplier/manufacturer.
- The *Contractor* shall specify the maintenance and calibration requirements.
- The *Contractor* shall provide a list of recommended spares, as well as a list of critical spares to maintain the system. Each list will include relevant OEM part numbers for procurement purposes.
- The *Contractor* shall include in the scope of supply such spares necessary to maintain the system in the short term of 2 years after installation.
- Existing components (i.e., cabling, sensors, etc.) that are current and compatible with the new system and not at risk of becoming obsolete within the foreseeable future shall be reused.
- All equipment marking and identification shall be in accordance with the relevant KNPS standards [83].
- Any equipment that does not have specific packaging, shipping, receiving, storage, and handling requirements covered by a specification shall comply with ASME NQA 1 Subpart 2.2.
- Equipment shall be under the supervision and insurance of the *Contractor* during all stages of packaging and shipping of the equipment.
- No shipment of equipment shall take place without an associated factory release authorised by the *Employer* or its appointed representative.
- The *Contractor* shall ensure that the manufacturer's recommendations regarding shipping and packaging are adhered to. The *Contractor* shall advise the *Employer* of any special provisions regarding storage.
- The KIS System shall be designed in full compliance with standard ISO 9001 [59].
- The design shall include:
 - Calculations and justifications showing that the design meets the modification objectives.
 - Specifications for installed items.
 - Updating of all affected existing KNPS documentation to reflect the new installations, including, but is not limited to:
 - (a) DSE documents,
 - (b) Electrical and Instrumentation documents, including, but not limited to, drawings, diagrams, and isometrics,
 - (c) Specifications,
 - (d) Maintenance documents,
 - (e) Safety analysis reports,
 - (f) Operating technical specifications,
 - (g) Procedures,
 - (h) Licensed documents,
 - (i) Programmes.
- The design shall in all respects comply with the requirements of SANS 10142-1: The wiring of premises Part 1: Low-voltage installations [136].

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- Where the *Employer* has provided design requirements and a contradiction occurs, the most stringent requirement applies.
- All documentation, as specified herein, forms part of the services, and is supplied to the Project Manager by the *Contractor*. The *Employer* reserves the right to issue the *Contractor's* design or drawings to other contractors for purposes of construction, erection, maintenance, spares, verifications, modifications in future or any other purposes required by the *Employer*. The *Employer* has total rights to use the design as the *Employer* requires. The *Contractor* notes that all drawings and other documentation supplied to the *Employer* become the property of the *Employer* upon completion of the services.

3.3.4 Functionality

The new KIS system shall provide at least all the functionality of the existing installation as described in Section 1 (Description of the works).

The following components of the KIS system are to be considered in the scope of the upgrade.

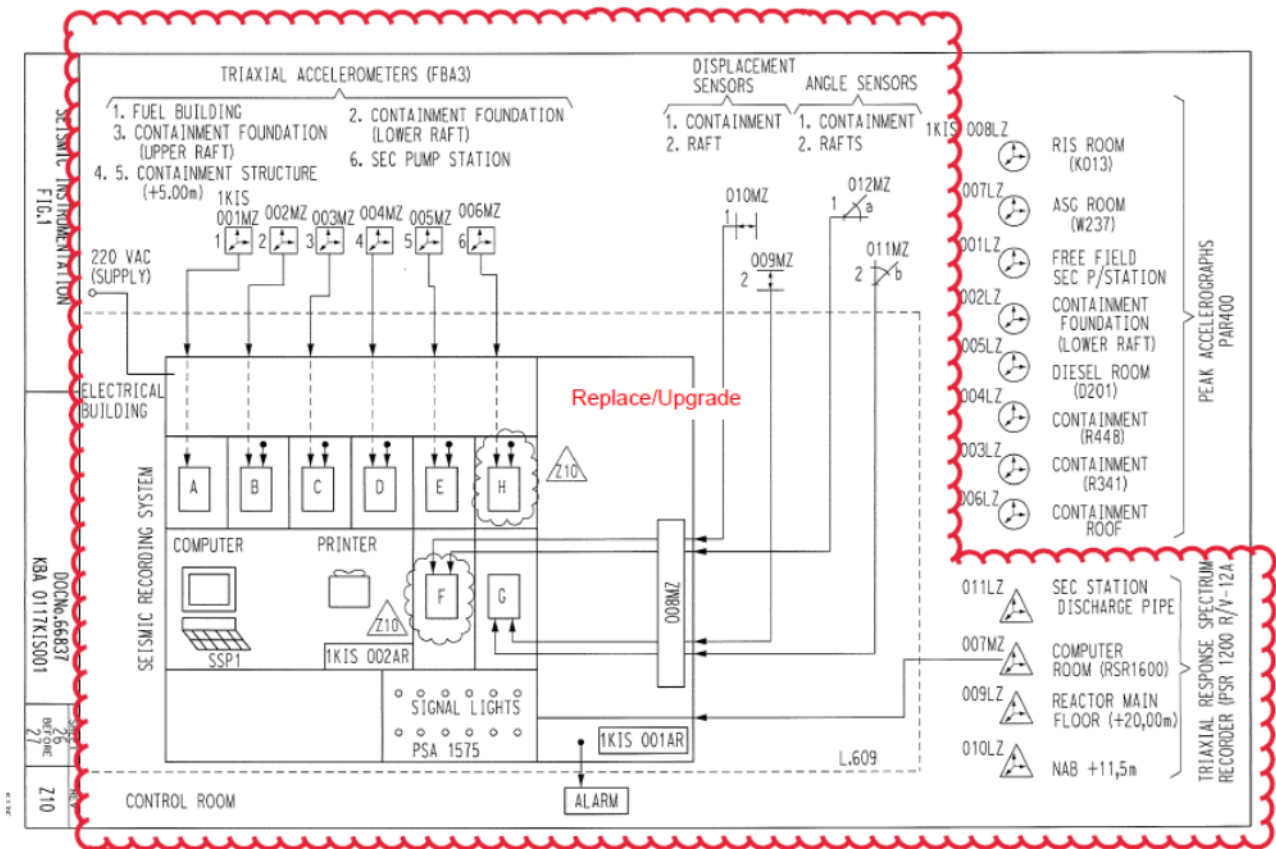


Figure 3-1: KIS System Upgrade Scope

3.3.4.1 Centralised Recording Cabinets

Refer to the *Employer's* works information, section 1.1 (Background) for information on existing design.

- The cabinets housing all the equipment shall fit within the following spaces respectively: 700 x 1100 x 2280 (mm) (WxDxH) and 700 x 1100 x 1920 (mm) (WxDxH). The existing cabinets are 585 x 830 x 2280 (mm) (WxDxH) and 585 x 815 x 1400 (mm) (WxDxH).
- Castor wheel interface points shall be designed on the base of the new cabinet frame to allow for the attachment of temporary castor wheels for easy manoeuvring of new equipment during installation. The supply of the castor wheels shall be in the scope of the *Contractor*.
- The cabinets shall be able to be tilted horizontally while being transported on the site for installation.
- These cabinets shall be upgraded with the latest technology components. An industrial PC with a printer shall be provided by the *Contractor* with the following:

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- The necessary software providing the capability of computing and displaying the response spectra for each monitored location, for each axis together with the trigger-and OBE/SSE alarm levels.
 - (a) Calculation and presentation of the cumulative absolute velocity (CAV) from each triaxial accelerometer.
 - (b) All recordings and displaying of measurements shall be done using the appropriate SI unit (g, degrees, or mm). If the measurements in g, degrees, or mm cannot be displayed, detail shall be provided on how these measurements will be presented.
 - (c) A licensed client copy of the analysis software package shall also be provided for installation on a remote Engineering workstation.
 - (d) This software package shall also have the functionality of simulating a seismic event which shall be utilised for training purposes.
- Dual redundant communication ports to interface KIS with the station DCS system (Ovation) using MODBUS TCP protocol over Ethernet.
- Capable of adjustable pre and post recording times of a seismic event, at a minimum, 60 seconds of low-amplitude motion prior to seismic trigger actuation and a minimum of 60 seconds beyond the last exceedance of the seismic trigger threshold.
- Capability to link to the station GPS clock system to provide time synchronisation using NTP over Ethernet.
- The recorders shall have a battery backup supply of 24 hours minimum. The UPS rating to the analysis station shall be at least 30 minutes.
- The recorder shall have an expansion/spare capacity for 4 additional sensors.
- Capability to download recorded data for remote analysis.

3.3.4.2 Linear Displacement Sensors

Refer to the *Employer's* works in formation section 1.1 (Background) for information on existing design.

- These sensors shall be replaced with similar specified and qualified components.
- The signal conditioning unit is obsolete and shall be replaced.

3.3.4.3 Angular Position Sensors

Refer to of the *Employer's* works in formation section 1.1 (Background) for information on existing design.

- These sensors together with its signal conditioning units are obsolete and shall be replaced with similar specified and qualified components.

3.3.4.4 Time History Triaxial Accelerometers

Refer to of the *Employer's* works in formation section 1.1 (Background) for information on existing design.

- These sensors shall be replaced with sensors that satisfy nuclear industry regulations USNRC RG 1.12 [119], IEEE 344 [55] and ANSI/ANS 2.2 [35].

3.3.4.5 Peaking Accelerometers (PAR 400 and PRA 103)

Refer to of the *Employer's* works in formation section 1.1 (Background) for information on existing design.

- These sensors are not within the scope of this project.

3.3.4.6 Triaxial Response Spectrum Recorder (PSR 1200 and RSR 1600)

Refer to of the *Employer's* works in formation section 1.1 (Background) for information on existing design.

- The existing sensors together with associated PSA 1575 warning light panel in 1 KIS 001 AR are obsolete and shall be replaced.
 - The sensors 1 KIS 007 MZ, 009 LZ, and 010 LZ shall be replaced as follows:
 - (a) These sensors shall each be replaced with a standalone time history triaxial accelerometer with local recorder, powered by a stable and reliable power supply,

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- (b) These sensors shall remain operationally independent of the centralised solid state seismic monitoring system of 1 KIS 001 AR,
 - (c) These sensors' statuses, including but not limited to, the exceedance of preset thresholds and health status shall be annunciated in the centralised cabinet 1 KIS 001 AR,
 - (d) A touch screen computer with application software loaded shall be installed at or in proximity of each sensor to view and download recorded data in-situ,
 - (e) Each sensor/recorder/touch screen shall have at least a 1-hour battery backup supply,
 - (f) The capability to download recorded data for remote analysis shall be included,
 - (g) These sensors do not have to meet the requirements of Section 3.3.4.4.
- The sensor 1 KIS 011 LZ, located at an elevation in a seismic category 1 structure where the response is different to that of the containment structure, shall be replaced as follows:
 - (a) This sensor shall be replaced with a time history triaxial accelerometer and be recorded in the centralised cabinet 1 KIS 001 AR.
 - (b) This sensor shall meet the requirements of Section 3.3.4.4.
 - An additional time history triaxial accelerometer shall be installed in the CSB to record the seismic activity where the fuel casks are stored.
 - (a) This sensor shall be a time history triaxial accelerometer and be recorded in the centralised cabinet 1 KIS 001 AR.
 - (b) This sensor shall meet the requirements of Section 3.3.4.4.

3.3.4.7 Interfaces

- The *Contractor* shall ensure that all design interfaces are fully compatible with the existing plant and systems in use. Deviations shall be reported and presented to the *Employer* for acceptance.
- The existing interfaces of the KIS system with other plant systems shall be retained. In particular, the interface with the Unit 1 control room alarm [85], KIT system and KNPS database (InSQL) shall be maintained.
- The seismic event alarm signal, KIS 001 IA, shall be recorded on the KIT system as a KIT digital input (EC).
- Existing interface with electrical boards is to be maintained as far as possible. The electrical load on the affected electrical board and circuit shall be re-evaluated. Volt drop requirements between point of supply and loads shall be adhered to.
- The design shall evaluate the possibility of reusing existing cabling.
- Input and output signals shall be compatible with the requirements of the KIT system.
- The data generated by the instrumentation shall be accessible and be stored as historical data.
- The control system and instrumentation shall not cause electrical interference and/or signal distortion.
- The new system shall be capable of continuously monitoring the system state-of-health (functionality of the whole measuring chain including sensors, cables, recorders, and the centralised cabinet) and issue an alarm any time an error occurs.

3.3.5 Testing

- The *Contractor* shall be responsible for the performance of all tests in accordance with applicable Codes and Standards plus all additional requirements specified herein. The *Contractor* shall be responsible for furnishing all facilities necessary for the performance of such tests.
- The *Contractor* shall be responsible for the performance of factory acceptance test (FAT) and site acceptance test (SAT).
- The *Contractor* shall produce full FAT and SAT procedures.

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- Prior to the performance of any test, the *Contractor* shall submit copies of the FAT and SAT procedures to the *Employer* for review and approval. Testing shall not commence until the *Contractor* has received a copy of the procedure that has been approved by the *Employer* and all the *Employer's* comments have been incorporated.
- Testing milestones shall include FAT and SAT.
- The *Contractor* shall invite the *Employer* to witness any testing being performed. Sufficient notice shall be provided to the *Employer* to accommodate this.
- All Non-Destructive Testing (NDT) done shall comply with the following *Employer* standard. 240-83539994: Standard for Non-Destructive Testing (NDT) on Eskom Plant [12].
- All instrumentation and equipment used for the performance of any test shall be calibrated. The calibration standard shall be traceable to the National Bureau of Standards. Furthermore, the instrumentation shall be of the appropriate range and shall be certified to have the accuracy required by the procedure. The calibration and accuracy shall be marked on the instrument, and full documentation shall be available for review.
- Material test certification and reports as specified in the *Employer's* works information shall be included as part of the End of Manufacturing Report (EOMR).
- The following tests shall be required as a minimum for all material supply:
 - (a) Chemical analysis,
 - (b) Tensile testing. This is not required at temperature unless the applicable material or design code requires it,
 - (c) Ultrasonic testing as required by material code,
 - (d) Liquid penetrant testing or magnetic particle inspection (MPI) testing.

3.3.6 Installation

- The design shall consider all installation-related constraints.
- The Permit to Work (PTW) to perform/supervise work is completed by a responsible person (RP), supplied by the *Contractor* in accordance with the *Employer's* plant safety regulation (PSR) procedures.
- PTWs are raised and processed in accordance with the *Employer* procedure KAA-667 [68]
- The *Contractor* shall ensure that mitigations are in place that shall minimise the installation time to comply with OTS requirements [126] regarding inoperability of instrumentation channels.
- The *Contractor* is responsible for the successful installation of the new KIS system. This includes but is not limited to:
 - The preparation of installation and verification procedures.
 - The identification and disconnection of cables connected to the old equipment to be dismantled.
 - The identification, dismantling and removal of the obsolete equipment to the scrap yard. (The *Employer* shall be responsible to transport the equipment off site).
 - Supply of the installation and assembly on site.
 - Supply of new cabling and connections between the new pieces of equipment and plant interfaces.
 - The installation and connection of new cables connected to the cabinets of the *Contractor's* supply.
 - Wire-to-wire verification of new and existing cables.
 - The *Contractor* shall provide all the required material.

3.3.7 Commissioning

- It is the *Contractor's* responsibility to perform the commissioning in accordance with the approved commissioning procedures in the design document and conform to the *Employer's* works information.
- The *Contractor* shall produce a comprehensive testing and re-qualification procedure of the proposed KIS system. The purpose of the testing will be to verify correct operation as per the design.

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- The *Contractor* shall provide all the test equipment for testing, the sub-assemblies and the functional groups for site testing, commissioning, and performance testing.
- The *Contractor* shall submit a full commissioning plan in accordance with KFA-006 [91] and KAA-648 [66] and shall be submitted to the *Employer* for acceptance.
- The *Contractor*, with the assistance of the *Employer's* commissioning team, is responsible for commissioning.
- It is the *Contractor's* responsibility, with the assistance and input from the *Employer's* commissioning team, to establish project commissioning policies and plans which cover:
 - Approval of commissioning programs and procedures,
 - The coordination of the *Contractor's* commissioning interfaces,
 - The scheduling and progressing of commissioning activities,
 - The availability of manpower, plant, material, and equipment resources,
 - Safety assurance and statutory requirements,
 - The completion of contractual obligations,
 - Any other relevant commissioning issues,
 - Review and integration of the *Employer's* existing commissioning programs and procedures,
 - Development of appropriate check lists,
 - Plan, implement and control the applicable commissioning activities,
 - Conduct inspections necessary for the issue of a completion certificate,
 - Ensure that Defects are timely rectified.
- The commissioning of the new KIS system includes but is not limited to the following:
 - Applying power to the various pieces of equipment that make up the supply,
 - Start-up of the sub-assemblies of the supplied equipment,
 - Individual checking and testing of these sub-assemblies,
 - Setting up, calibration and adjustment of equipment,
 - Functional tests on the new KIS system,
 - Performance tests on site,
 - The alarm to the control room is checked for correct output and compared to the plant computer (KIT),
 - Verification of equipment and validation of test procedures,
 - Provision of test reports.

3.3.8 Maintenance

- Maintenance requirements for the KIS System shall be minimised and shall consider access constraints due to location of components and possess the following characteristics:
 - Accessibility
 - Modular system construction, expandability, and standardised system configuration and hardware.
 - Supports on-line maintenance.
 - Diagnostic tools and the easy identification of faults
 - Within the design requirement limits, environmental conditions should not increase maintenance requirements.
 - The maintenance regime shall be achievable within KNPS's planned maintenance and outage programs.
- The *Contractor* shall supply all special tools and equipment required to perform the prescribed maintenance on the proposed KIS system, considering that certain testing equipment, e.g., tilting tables shall be used within the controlled zone and outside of the controlled zone respectively.

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3.3.9 Cyber Security

- The system shall be tested for cyber security invasion, anti-virus protection, and prevention of unauthorised access to the computer system and terminals.
- A list shall be compiled of all MAC addresses.
- All servers shall be configured in such a way that all brute force attacks and all multiple single password attempts shall be logged.
- “Backdoor”. The developer shall agree to disclose all backdoors created for software testing purposes, or any other purpose, with an understanding to remove all backdoors before commissioning. The *Employer* shall deem the non-disclosure or non-removal of these backdoors as hostile and shall take appropriate action.
- All data tables and data objects shall be accessible through the normal Database Management System (DBMS) functionality, i.e., no private or proprietary tables and / or objects shall be used.
- Each user shall have a unique account on the system, (i.e., username and password).
- User account passwords shall be in line with Eskom standards on passwords for OT systems in accordance with 240-55410927 [8].
- System administrator shall have the ability to be able to create, disable, and remove user accounts as need be, however changes to this degree shall also be logged in an unaltered file for auditing purposes.
- Inactive user accounts shall automatically be disabled after a reasonable specified time.
- User accounts shall automatically be locked if there are multiple failed login attempts, which shall be logged for retrieval.
- Users shall not have any access to functionality other than that required to perform their duties.
- The interface shall perform under all expected operating conditions, irrespective of server load, network load or any other condition normally expected of a system of this nature.
- The system shall automatically recover from any loss in communication between any of its components and external interfaces.
- All actions of users shall be logged with full detail of their action. The logs must also indicate values before and after actions, and these logs shall be used for auditing purposes.
- All non-used ports on network devices shall be blocked electrically and physically.
- All network equipment shall keep a log of events and changes to their configurations.
- All devices shall operate on static IP addresses.
- A list shall be compiled of all IP addresses.
- Unused IP address shall be blocked on the system and shall have to be manually unblocked.
- There shall be a single connection to the *Employer* business LAN. The connection shall not be a direct connection but run through a DMZ connection as described in 240-79669677 Demilitarised Zone (DMZ) Design for Operation Technology [11] , section 3.1.1 which shall be used for the network design.
- There shall be a hardware, firmware, and software configuration management program proposed which shall form part of the NOU processes for updating digital systems.
- A program shall be developed on how software will be updated.
- A program shall be developed on how the system will be backed up. If the back-up is to be stored at a non-secure location, then the backup shall be encrypted.
- Disaster recovery and contingency plans must be developed and tested where possible.
- No data should be stored on portable devices. If such data does need to be stored on the system, then all the data shall be encrypted.
- The system shall have malware protection software and there shall be a program for updating this software, Windows updates and Antivirus software shall be covered.

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- The system shall detect and manage a DoS attack automatically.
- The system shall have intrusion detection and prevention software.
- All cabinets and equipment boxes shall have physical access control. Physical locks on the system cabinets shall be different from other systems on the site.
- All unused ports on computers and servers shall be disabled in software and physically disabled for use.
- The system shall be designed to handle the loss of environmental control for durations as defined in the detailed design.
- The protocols used on the network shall be encrypted.
- The systems shall perform integrity checks and data flow controls on all data in the network.

3.3.10 Service Life

- The KIS System shall have a design life sufficient for the remainder of the design life of the plant, including the life extension time frame, i.e., the System shall have a service life of at least 40 years.
- Maintenance requirements, to achieve the 40-year service life, shall be identified. (Refer to Section 3.3.8 for Maintenance Requirements).
- The KIS System shall use equipment that shall as far as possible negate the likelihood of obsolescence during the 40-year service life.
- A list of spares that are deemed important to ensure the 40-year life span of the KIS system shall be included in the design.
- Operating and lifetime cost shall be minimised.

3.3.11 Engineering and Implementation Strategy

The Engineering and Implementation Strategy clearly shows how the *Contractor* plans to deliver the *services*. This plan is submitted as part of the tender and shall be resubmitted according to the accepted program after contract award to the *Employer* for his acceptance.

As a minimum, the Engineering and Implementation Strategy shall elaborate on the following:

- A design and implementation narrative demonstrating how the *Contractor* plans to carry out the *services* and meet the *Employer's* requirements.
- A detailed list with accompanying descriptions of the *services*, including, but not limited to:
 - Setting out the boundaries of the technical effort,
 - Possible challenges or risks regarding the *services*,
 - Design interfaces,
- A list of exclusions and deviations from the Scope. This list explains the proposed exclusion/deviation, the rationale for the exclusion/deviation, any technical data supporting the exclusion/deviation and historical experience supporting the exclusion/deviation.
- A risk register which addresses the key risks and constraints of the Scope. The register includes a clear description of the risk, the root cause, a risk ranking and a mitigation plan, including a rating on the effectiveness of the mitigation plan.
- A programme, listing all the various components of the *services*, with associated durations and respective accountable persons.
- Engineering design team list and organogram.
- A description of the tools and systems that shall be used to carry out the engineering design work.
- How training shall be carried out.

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3.3.12 Equipment Qualification Requirements

The *Contractor* shall supply a quality assurance data package (QADP) for the replacement of the KIS system.

The QADP shall include, but not limited to, the following documentation:

- Certificate of conformance.
- Certificate of manufacture.
- Completed and signed-off FATs and SATs,
- Copy of Eskom order.
- Copy of the specifications.
- Manufacturing QCP.
- Material certificates.
- Welder qualification and certificates.
- Weld qualifications.
- NDE/NDT reports.
- The *Employer* waivers (if applicable).
- Non-conformance reports.
- Final supplier QA release; and
- Seismic qualification report.
- Installation QCP.
- End of Manufacturing Report

3.3.13 Plant Computer Interface (KIT) Requirements

- The *Contractor* shall design, configure, and install the KIS system ready for KIT interfacing. This includes but not limited to physical changes, cabling, hardware, programming, testing, and commissioning associated with providing such interface.
- The existing interfaces of the KIS system with KIT shall be retained [85]Monitoring enhancements i.e., additional digital/analogue points shall be submitted by the *Contractor* for review and approval by the *Employer's* Engineering Representative.
- The KIS system shall use the MODBUS TCP protocol over Ethernet to interface to the KIT (Ovation) system.
- The *Contractor* shall provide the mapping (addressing) for the MODBUS variables to be transmitted to KIT.

3.3.14 Human Factor Engineering

Human Factor Engineering (HFE) changes shall be evaluated by the *Contractor*. Refer to 331-87 [22] for relevant guides on reviewing Human Engineering aspects of the design.

3.3.15 Design for Safety**3.3.15.1 Nuclear Safety**

A safety screening and/or evaluation shall be performed by the *Contractor* in accordance with KNPS procedures 240-143604773 [7] and 240-142639998 to [6] to show that nuclear safety is not degraded by the design and installation of the KIS system. Where the *Contractor* does not have authorised safety evaluators, the *Employer* shall provide such authorised safety evaluators to assist the *Contractor* with performing the safety screening and/or evaluation.

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3.3.15.2 Conventional Safety

- The modification shall not introduce additional risks to personnel or plant integrity.
- Applicable civil codes/building regulations must be identified and complied with.

3.4 Procedure for submission and acceptance of Contractor's design

The *Employer's* process for designs which the *Contractor* must comply with is detailed 331-86. The *Contractor* enters this process at step D.

The *Contractor's* design complies with all technical requirements as documented in the *Employer's* scope of work section 3.3 as well as the requirements stated below;

The *Contractor's* design, as a minimum, addresses Parts A, B, C and D of the *Employer's* internal Design Template Revision 30. To allow a phased approach for the acceptance of the *Contractor's* design, the *Contractor's* design may be submitted in two parts:

3.4.1 Scheme Design document (Contractor's Design – 1st Phase)

The *Contractor's* Scheme Design addresses all requirements stated in Part A of the *Employer's* internal Design Template and includes the following additional items:

- Assessment of impact on security
- Assessment of impact on civil structures
- Failure Modes and Effects Analysis
- Environmental Impact Filtering
- Quality Assurance Requirements
- Project Team Concurrence Sheet (Part D attachment of the design template)

The *Contractor's* Scheme Design is sufficiently detailed to addresses the elements identified in the *Employer's* Review Report – KFU-026 Latest rev.

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Authorisation of designers		X	<ul style="list-style-type: none"> • The designers are authorised in accordance with the <i>Contractor's</i> quality system design procedures. 	In accordance with the Accepted Programme	The <i>Project Manager</i> may request proof of the authorisations which the <i>Contractor</i> then supplies.
Compilation of the Scheme Design and independent review		X	<ul style="list-style-type: none"> • The <i>Contractor</i> compiles the Scheme Design in accordance with his quality process. • The <i>Contractor</i> submits the independent review report performed in accordance with the <i>Employer's</i> Detailed Design Review Report. 	In accordance with the Accepted Programme	<p>Any calculations included in the Scheme Design are those essential for the justification of the design.</p> <p>Detailed calculations that shall not impact the design concept (i.e., pipe layout drawings and associated support calculations etc. can be provided as part of the Installation Design.)</p>

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Notification of recommended plant identifiers with proposed classifications		X	<ul style="list-style-type: none"> The <i>Contractor's</i> request includes, as a minimum, the following information for the <i>Employer</i> to verify the trigrammes and classification numbers: The unit number. (i.e., 0/1/2/6 or 9). (If it is 9, then the unit number where the parent trigramme is located is also provided). A detailed part functional description including the recommended bigramme. The location which specifies building and room number. The recommended classification for each trigramme allocation. The plant identifier's child/parent relationships (as per the hardware breakdown structure – to be developed as part of the Installation Design.) 	In accordance with the Accepted Programme	Plant codification (trigramme numbers) and their associated classifications are recommended by the <i>Contractor</i> and accepted by the <i>Employer</i> . There may be iterations on this request i.e., one request for the Scheme Design and a second request when compiling the Installation Design.
<i>Contractor</i> Scheme Design approval and submittal for 1 st <i>Employer</i> acceptance review.		X	<ul style="list-style-type: none"> Any design document submitted for acceptance reviews are approved by the <i>Contractor</i> in accordance with the <i>Contractor's</i> quality system design control procedure. 	In accordance with the Accepted Programme	Submitted to the <i>Project Manager</i> .
1 st Acceptance review from <i>Employer</i>	X		<ul style="list-style-type: none"> For the Scheme Design, the concurrence and specialist concurrence reviews are performed in parallel with the <i>Employer's</i> review. The <i>Project Manager</i> may arrange a Scheme Design review meeting with the <i>Contractor</i>. The <i>Contractor</i> attends this meeting. 	Within 2 weeks of submittal.	The review meeting aims to ensure that the <i>Employer</i> review comments are well understood by the <i>Contractor</i> .
Address <i>Employer</i> review comments and submit for 2 nd <i>Employer</i> acceptance review.		X	<ul style="list-style-type: none"> The <i>Contractor</i> addresses all the agreed and accepted review comments of the <i>Employer</i>. 	In accordance with the Accepted Programme	Submitted to the <i>Project Manager</i> .
2 nd Acceptance review from <i>Employer</i>	X		<ul style="list-style-type: none"> The <i>Employer</i> may raise additional review comments not identified during the first review. A Scheme Design review meeting may be requested, at the discretion of the <i>Project Manager</i>, depending on the number and nature of comments identified / resolved. 	Within 2 weeks of submittal.	
Finalisation of Scheme Design and submittal for <i>Project Manager</i> acceptance.		X	<ul style="list-style-type: none"> <i>Contractor</i> finalises the Scheme Design and submits to <i>Project Manager</i> for acceptance 	In accordance with the Accepted Programme	Submitted to the <i>Project Manager</i> .

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Final acceptance review and acceptance	X		<ul style="list-style-type: none"> Acceptance of the Scheme Design is subject to all previous review comments of the <i>Employer</i> being adequately addressed. 	Within 1 week of submittal.	
Verification of plant identifiers and SAP linking.	X		<ul style="list-style-type: none"> Verification of plant identifiers and SAP linking are performed in terms of <i>Employer's</i> own requirements 	Within 2 weeks of notification	
Conclusion	X	X	<ul style="list-style-type: none"> This activity group is complete upon the <i>Employer's</i> acceptance of the Scheme Design. 	In accordance with Accepted Programme	Deliverables: <ul style="list-style-type: none"> Scheme Design

3.4.2 Installation Design document (*Contractor's* Design – 2nd Phase)

The *Contractor's* Installation Design addresses the remaining requirements relating to Parts B, C, and D of the *Employer's* internal Design Template and ensures that all requirements of the Scheme Design are met. The *Contractor's* Installation Design consists of, but is not necessarily limited to, the following:

- Detailed calculations (including seismic qualification calculations)
- Detailed layout drawings
- Installation specifications
- Design commissioning requirements
- Configuration management file; and
- Procurement specifications consisting of classifications and the bills of material including the overall hardware breakdown structure (HBS).

The Configuration Management File consists of the *Employer's* DCIF form including all mark-ups of associated documents referenced there-in. The submission of the configuration information is performed in accordance with the table below:

Stage:	Configuration File Updates: DCIF plus:
Installation Design 1 st submission for acceptance	All DDRs and operating procedure mark-ups
Installation Design 2 nd submission for acceptance	As above plus SAR and OTS mark-ups
Installation Design final submission for acceptance	As above plus maintenance procedure mark-ups

The functional description of the modification is sufficiently detailed to describe the overall impact of the modification on the plant i.e., it should not be required to consult logic diagrams etc. to interpret and understand the overall change and how the plant shall operate following the change.

The *Employer's* logo is added on all design reports. The *Contractor* may add his or his subcontractor's logo to the documents.

The design demonstrates that all OH&S Act requirements have been met.

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Compilation of the Installation Design and independent review		X	<ul style="list-style-type: none"> The Installation Design includes any detailed design calculations not covered in the Scheme Design. 	In accordance with Accepted Programme	The Installation Design includes (but is not limited to) the following:

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
			<ul style="list-style-type: none"> • The Documentation Identification Change Form (DCIF) lists all drawings, documents, and procedures (operational, maintenance etc) including the Safety Analysis Report (SAR) and Operational Technical Specifications (OTS) affected by the modification. • The <i>Contractor's</i> designer discusses the potential OTS and SAR changes with the applicable <i>Employer</i> representative. • All document change mark-up requests are to be registered for update (DDR No's, SAR & OTS Change No's) upon submittal of the Installation Design to the <i>Project Manager</i>. • The <i>Employer</i> may, as part of its acceptance reviews, identify additional documents and drawings to be added to the DCIF following which the <i>Contractor</i> provides the mark-ups of those additional drawings and documents at the next submission for design acceptance review. • The <i>Contractor</i> provides a comprehensive overview of the hardware breakdown structure for the overall modification with reference to associated part numbers and parent/child relationships and (where applicable) associated trigrammes. The lowest level of the hardware breakdown structure is that of the individual component that is commercially available as a spare from the recommended supplier. The <i>Contractor</i> provides a numbering methodology for numbering the components. The component numbering should be traceable to specific part numbers referenced in the Bills of Materials with all associated information required for the spares management. The hardware breakdown structure is included in the same report as the BOM. • The BOM list all components identified in the hardware breakdown structure and show whether the component is a recommended or critical spare as well as the procurement lead time of each component. In addition to the <i>Employer's</i> template provided, the BOM also contains a "Receipt Inspection Reference Number" 		<ul style="list-style-type: none"> • Qualification of piping, plant (mechanical, electrical and instrumentation) for normal operating, accident, and installation conditions, • System flow drawings, • General arrangement drawings, • Equipment layout drawings, • Piping isometric drawings • Cable routes and wiring diagrams, • Logic diagrams, • Component maintenance manuals, • Component assembly drawings, • Component seismic calculations and test reports. • Component supplier recommended spare parts listing. • Component sectional drawings with identification. Comprehensive spare parts listing related to the component sectional drawings. • Operations manual for the complete <i>works</i> and for individual Equipment, Plant and Material items. • Spares lists including part numbers for each component and accordance with the hardware breakdown structure, • Plant and Material, manufacturing and installation specifications and drawings. • Software (including firmware and configuration) files and applicable revisions.

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
			<p>column where the <i>Contractor's</i> receipt inspection report as well as the <i>Employer's</i> surveillance report numbers are recorded during the receipt inspection process, and which shall be completed and submitted to the <i>Employer</i> as part of the "AS-BUILT" submission of the design.</p> <ul style="list-style-type: none"> The relevant design report specifies commissioning, testing and in service periodic testing once the modification has been installed. Plant conditions for the tests and associated acceptance criteria are stated in the relevant design report. New performance/in-service tests and changes to existing <i>Employer's</i> performance/in-service test procedures are identified by the <i>Employer</i> and listed in the DCIF by the <i>Contractor</i>. The <i>Employer</i> shall be responsible for the mark-ups. The <i>Contractor</i> provides any technical inputs as required by the <i>Employer</i>. The <i>Contractor</i> submits the independent review report performed in accordance with the <i>Employer's</i> Detailed Design Review Report. 		
Contractor Installation Design approval		X	Any design reports submitted for acceptance reviews are approved by the <i>Contractor</i> in accordance with the <i>Contractor's</i> quality system design control procedure.	In accordance with Accepted Programme	
Installation Design submittal for 1 st <i>Employer</i> acceptance review		X	<ul style="list-style-type: none"> The <i>Contractor</i> clearly states which design report is submitted for review. 	In accordance with Accepted Programme	Submitted to <i>Project Manager</i> .
1 st Acceptance review from <i>Employer</i>	X		<ul style="list-style-type: none"> The <i>Project Manager</i> may arrange a design report review meeting with the <i>Contractor</i>. The <i>Contractor's</i> attends this meeting. 	Within 3 weeks of submittal.	The review meeting aims to ensure that the <i>Employer</i> review comments are well understood by the <i>Contractor</i> .
Address <i>Employer</i> review comments and submit for 2 nd <i>Employer's</i> acceptance review.		X	<ul style="list-style-type: none"> The <i>Contractor</i> addresses all the agreed and accepted review comments of the <i>Employer</i>. 	In accordance with Accepted Programme	Submitted to <i>Project Manager</i> .
2 nd Acceptance review from <i>Employer</i>	X		<ul style="list-style-type: none"> 2nd <i>Employer</i> review comments are limited to clarifications and corrections to 1st review comments. 	Within 2 weeks of submittal.	
Finalisation of Installation Design and submittal for <i>Project Manager</i> acceptance.		X	<ul style="list-style-type: none"> Installation Design is finalised by the <i>Contractor</i> and submitted for <i>Project Manager</i> acceptance. 	In accordance with Accepted Programme	Submitted to <i>Project Manager</i> .

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Final acceptance review and acceptance	X		<ul style="list-style-type: none"> Acceptance of each design report is subject to all previous review comments of the <i>Employer</i> being adequately addressed. 	Within 1 week of submittal.	
Conclusion	X	X	<ul style="list-style-type: none"> This activity group is complete upon the <i>Project Manager's</i> acceptance of the relevant design reports that comprises the <i>Contractor's</i> design. 	In accordance with Accepted Programme	Deliverables: <ul style="list-style-type: none"> Installation Design Design Reports Configuration Updates Trigramme and Classification verification request OTS Update Request (Where applicable) SAR Change Notification Request (Where applicable) Procedure Change Request DDR's

3.4.3 Safety evaluation

Where there is a possible interface with / impact on safety related equipment, the *Contractor's* design complies with the applicable design codes as described in the KOU Safety Analysis Report (ASME, IEEE etc...).

The *Contractor's* design is such that it does not introduce any additional risk to the safety and/or operation of the plant and/or its people and/or the environment.

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Authorisation of individuals in accordance with KTA-001.		X	<ul style="list-style-type: none"> All safety screenings, evaluations and justifications are performed by authorised individuals in accordance with KTA-001. 	N/A	
Compilation of a Scheme Design document / Installation Design document and independent reviews		X	<ul style="list-style-type: none"> Process in accordance with KAA-709. 	In accordance with Accepted Programme	Although not obligatory, it is encouraged that the compiler of the design may not be the compiler of the Safety Evaluation documentation.
Probabilistic Safety Assessments (PSA) evaluation.	X		<ul style="list-style-type: none"> The <i>Employer</i> performs the PSA. The <i>Contractor</i> to supply all relevant input information when requested to furnish information 		

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Incorporate PSA results into safety evaluation and confirm applicability of PSA to detailed design	X		<ul style="list-style-type: none"> The <i>Contractor</i> notifies the <i>Project Manager</i> of any discrepancies in the PSA study. The <i>Contractor</i> corrects any safety concerns highlighted by the Safety Evaluation / PSA in its design. 	In accordance with Accepted Programme	
Presentation of safety evaluations, justifications, and cases to KORC for approval.	X		<ul style="list-style-type: none"> The <i>Project Manager</i> arranges with KORC for an opportunity to present information at KORC. Both the <i>Project Manager</i> and the <i>Contractor</i> attends the meeting. The <i>Project Manager</i> performs the presentation. 	In accordance with Accepted Programme	Regular meetings are scheduled every Monday but arrangement of special KORC meetings is possible for urgent issues.
Approval of safety evaluation documents.	X		<ul style="list-style-type: none"> <i>Project Manager</i> acceptance is subject to the requirements of the safety evaluation process being met. 	In accordance with Accepted Programme	Employer's KORC Chairman approves the documents
Originals in Scheme Design and copies to TD & RM, copy to RRM, copy on LAN.	X		<ul style="list-style-type: none"> The <i>Project Manager</i> submits the approved Safety Evaluation documentation to the <i>Contractor</i>. 	In accordance with Accepted Programme	
Conclusion	X	X	<ul style="list-style-type: none"> This activity group is 90% complete upon <i>Employer's</i> acceptance of the safety evaluation and 100% complete upon authorisation of the safety case for implementation by the NNR. 	In accordance with Accepted Programme	Deliverables: <ul style="list-style-type: none"> Safety screening document (where applicable), Safety evaluation (where applicable), Safety justification (where applicable) and Safety case for implementation (where applicable). KORC presentation

3.5 Other requirements of the Contractor's design

3.5.1 Design services activity matrix

3.5.1.1 Investigation phase

The *Contractor* shall comply with all requirements defined in the *Employer's* works information section 3.3 (Parts of the works which the Contractor is to design).

3.5.1.2 Design phase

3.5.1.2.1 Employer licensing support with National Nuclear Regulator (NNR)

The *Contractor* provides support and does all rework necessary on or in connection with the design change packages until the *Employer* has obtained approval from the National Nuclear Regulator (NNR) for the design change.

For clarification, NNR responses are categorised into four categories, namely:

- Subjective: These do not affect or impact on the safety case or the technical intent of the modification. Rework resulting from these requests is not included in the scope of work.
- Objective: These are changes due to a Defect in the safety case or the technical intent of the modification. Rework resulting from these requests is included in the scope of work.
- Configuration Control: Changes requested to any documents or procedures identified by the NNR for update. Rework resulting from these requests is included in the scope of work.
- Conceptual: These comments are applicable to the conceptual intent of the modification which is described in the Technical Requirement Specification (TRS). The *Employer* is responsible for the TRS, and any rework required because of changes in the conceptual intent is not included in the *Contractor's* scope of work.

3.5.2 Supportability

The *Contractor* confirms that technical support of the installed system is available for the remaining life of the plant from the Completion of the *works*. The *Employer* is immediately informed, in writing, of obsolete components and their equivalent replacements.

3.6 Use of *Contractor's* design

The *Employer* owns the rights and uses all documents and data for the sole purpose of all its needs at KOU.

The *Employer* may submit, without restriction, all documentation to:

- The South African National Nuclear Regulator, or its nominated third party, for information and licensing purposes. The *Contractor* shall be informed in writing if the NNR makes use of a third party for review.
- Others employed or contracted by the *Employer* and who have duly signed a confidentiality and non-disclosure agreement with the *Employer*.

3.7 Design of Equipment

The *Contractor* shall comply with all requirements defined in the *Employer's* works information section 3.3 (Parts of the works which the Contractor is to design)

3.8 Equipment required to be included in the *works*.

The *Contractor* shall comply with all requirements defined in the *Employer's* works information section 3.3 (Parts of the works which the Contractor is to design).

3.9 As-built drawings, operating manuals, and maintenance schedules

3.9.1 Documentation to be supplied by the *Contractor*.

Operating manuals and maintenance schedules are provided as part of the Configuration Management File of the Installation Design. The information is customised to the KOU. The *Contractor* provides any additional support information required by the *Employer's* Maintenance Basis and In Service Inspection and Testing groups, to assess related interventions during the life of the Plant.

As-built drawings are provided as part of the *Contractor's* as-built design submission as defined below:

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Compilation and submission of End of Implementation Report (Per Unit)		X	<ul style="list-style-type: none"> • In accordance with <i>Contractor's</i> quality management system. • The End of Implementation Report provides all the completed installation records and certification per KOU unit as required by the Work Plan and testing procedures and consists of (as a minimum, but necessary limited to) of: <ul style="list-style-type: none"> – all completed and signed off Work Plan documentation and test procedures, – all associated NDE reports and (where required) staff qualification records, – signed certificates (COCs, CSCs, SCCs), – non-conformance reports – referenced receipt inspection as well as <i>Employer</i> surveillance report numbers with associated material and component quality assurance data packages), – signed off DRs as well as signed off Design Field Changes (including all associated configuration control update requests) – Any other implementation records required by the specified Quality Assurance requirements i.e.: Updated system software and configuration files etc.) • The <i>Contractor</i> provides objective evidence that an internal quality assurance review was performed on the completed package prior to submission to the <i>Employer</i>. 	Within 2 weeks from PTW clearance.	Equipment and Component QADP typically includes the following documentation: Manufacture Quality Plan Material Certificates. Non-Destructive Examination Records (if applicable). Test Records. Weld Specifications (if applicable). Non-Conformances. Authorised component drawings and specifications. Seismic report (if applicable). Conformance Certificates. Certificates of Compliance Disconnection / Re-connection sheets. Construction Status Certificates. Clearance Certificates.
Resolution of outstanding items		X	<ul style="list-style-type: none"> • It is required that all outstanding items are resolved as to not prevent the <i>Employer's</i> use of the works 	As required	
Plant take-over		X	<ul style="list-style-type: none"> • The plant shall be taken over per unit only when the <i>Contractor</i> has completed all his obligations in terms of the contract. • Take-over is co-ordinated by the <i>Contractor</i>. 	In accordance with Accepted Programme	
Signing of the Hand Over Certificates and Finalisation of overall modification QADPs	X			As required	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Conclusion	X	X	<ul style="list-style-type: none"> Completion is upon authorisation of the project hand-over certificate - KFU-PE-008 in accordance with KAA-501. 	Within 2 weeks from PTW clearance.	Deliverable: Modification QADPs Hand-over certificate - KFU-PE-008 duly signed by the <i>Employer</i> .

It is the responsibility of the *Contractor* to plan his supply of documentation according to requirements and to indicate dates on the Accepted Programme.

3.9.2 Maintenance manuals

Maintenance manuals must form part of the Configuration Management File submitted as part of the Installation Design. As-built changes affecting the maintenance manuals are submitted as part of the as-built design submission.

3.9.2.1 Number of manuals

Full and comprehensive maintenance manuals are supplied by the *Contractor*. Two (2) complete printed copies of all documentation are supplied. One copy is marked 'Master Copy' and one 'Reference Copy'. The aforementioned are also handed over in a searchable electronic format.

3.9.2.2 Modifications (during the period to the Defects Date)

The *Contractor* provides any additional and amended pages, sufficient for all copies of manuals, to ensure that they are complete with details of final settings and modifications made up to the Defects Date. Such information is forwarded to the *Project Manager* progressively and promptly following receipt of agreement to equipment or system design modifications. The materials used for updated pages are the same as that used for the original documentation.

3.9.3 "AS BUILT marked up" plant hand over documentation.

Submission of the "As Built" documentation, which is subject to acceptance by the *Project Manager*, is a pre-requisite for Completion.

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Compilation and submission of As-Built design documentation and drawings.		X	<p>The process for maintaining the design status shall be as follows:</p> <ul style="list-style-type: none"> After 1st Unit implementation, the <i>Contractor's</i> design is updated to consider the first unit design changes – approved by means of DRs and DFCs – reference is made in the design with regards to which DRs and DFCs are incorporated into the design revision. Where required, the Work Plan and test procedures associated with the 2nd unit implementation are updated as well. After 2nd Unit implementation, the <i>Contractor</i> provides a final design revision update following implementation and testing. 	Within 2 weeks from PTW clearance.	Acceptance process for updated design, Work Plan and test procedures may be simplified for these submissions as it is assumed that all changes were already approved by means of the DR and DFC processes.

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3.9.4 Final documentation

Submission of the "End of Implementation Report" documentation, which is subject to acceptance by the *Project Manager*, is a pre-requisite for Completion.

3.9.5 Document control

The *Contractor* implements a comprehensive document management system for control of all documents including but not limited to drawings, procedures, and manuals. The document management system provides information on the document revision status and of document status in relation to the 'as built' and 'as designed' status on each plant group or sub-group. The system is part of the Quality Management programme identified in the Quality Management Manual, supplied by the *Contractor*.

3.9.6 Configuration control

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Provision of Completed Spares Assessment Input Sheet and supporting data		X	In compliance with KAA 614. The <i>Contractor</i> provides the required input data for every new component that is installed on the plant. Should the <i>Contractor</i> need support to clarify whether equipment is standard or not, he clarifies with the <i>Project Manager</i> .	In accordance with Accepted Programme	All input data to be provided by official communication. The <i>Employer</i> shall complete the required spares registration process.
Provision of Maintenance Basis programme requirements and supporting data.		X	<ul style="list-style-type: none"> In accordance with KAA 614 and KSU-006. 	In accordance with Accepted Programme	All input data to be provided by official communication. The <i>Contractor</i> provides a detailed description of the required <i>Employer</i> tasks including their frequency, detailed description and objective of each task required to maintain the installed Plant and Material. This information is provided after the <i>Contractor's</i> design has been accepted and prior to installation. The <i>Employer</i> shall complete the required maintenance bases updates.
Identification, compilation and review of document change requests and submission to the <i>Employer</i> .		X	<ul style="list-style-type: none"> DDR, SAR, and OTS Change notifications and proposed procedure (operations and maintenance) changes. 	In accordance with Accepted Programme	Submitted to the <i>Project Manager</i> .
Processing of document changes as per relevant process procedure.	X		<ul style="list-style-type: none"> As referenced in KAA-501. 	As required	
Process custodian interface and support	X		<ul style="list-style-type: none"> The <i>Contractor</i> provides all required information and supports the <i>Supervisor</i> with the interface. 	As required	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Presentation of SAR and OTS changes to relevant committees.	X		<ul style="list-style-type: none"> Contractor to support. 	As required	
Document release for UPDATING (DDT)		X	<ul style="list-style-type: none"> For discrepancies: "As-built" changes are only submitted for update upon Employer acceptance of each Discrepancy Report. 	To - 3 months	This is the formal action given to the Employer to commence with updating of the Master documents.
Updating of Masters	X			3 months – pre-outage submittals 1 month - for as-builts	
Verification of Master Updates (Confirmed correct)		X	<ul style="list-style-type: none"> Verification is limited to the scope of the change because of the modification. Where discrepancies impact on DDR's and the DDR is to be changed, red-line mark-up shall be provided. The updated DCIF forms part of the Design update (following 1st unit implementation) or Design Field Change (2nd unit implementation). 	As required	
Approval for RELEASE of documents		X	<ul style="list-style-type: none"> Operational documentation is released prior to PTW suspension for testing (i.e., prior to the plant being made live). Non-operational documentation is released prior to Permit to Work clearance. 	As required	This is the formal request to release the updated documents to the various documentation centres and operations control room.
Distribution of documents to documentation centres	X			As required	For immediate availability, Contractor to co-ordinate and arrange. For within three days - Employer can provide the function.
Conclusion			This activity group is complete upon release of all affected documents to the Station (including "As-Builts".	As per Accepted Programme	Deliverables: <ul style="list-style-type: none"> DDRs SAR Change Notification OTS Update Request Procedure Change Requests "As Built" drawings. Updated DCIF form

4 Procurement

4.1 BBEE and Preferential Procurement Policy Framework Act (PPPFA) Minimum requirements of people employed on the Site.

Minimum requirements

The *Contractor* must be in possession of valid BBEE status level of contribution. Suppliers shall be further evaluated in terms of their price and B-BBEE status level of contribution using the 80/20 preference point system for procurement greater than R1 million:

- 80% Price; and
- 20% B-BBEE Status Level of Contribution.

An approach involving cross functional teams shall be taken during the evaluation of tenders to ensure that the best interests of the *Employer* are assured.

4.2 Tenderer's Supplier Development, Localisation, and Industrialisation (SDL&I) Undertaking

4.2.1 Skills Development

SDL&I role is to support government's objectives for socio-economic contribution, by ensuring alignment to national transformation imperatives that shall unlock growth, drive Industrialisation, and create employment and skills development. This shall be achieved through a coordinated and strategic focus to support transformation, localisation, and Industrialisation.

The SDL&I input shall be regarding the application of Regulation 9 (where it is feasible to sub-contract to either an EME or QSE) and Regulation 4 (where the B-BBEE Level Contribution of sub-contractor must be minimum Level 4). This shall form part of the mandatory prequalification criteria.

Skills development forms part of the contract's deliverables under the design requirement for this scope. The skills development requirement shall be Experiential training of I&C technicians is indicated in the SDL&I Undertaking.

Job retention and job creation shall be requested from the contractors in the enquiry which shall then form part of the contractual obligations.

4.2.2 Local Content and Production, Designated sectors (PPPFA 2017, regulation 8)

The Department of Trade and Industry (DTI) has designated certain sectors/products for local production and content. Where applicable stipulate which materials are identified as designated materials and what thresholds the tenderers must meet to be evaluated further.

The following designated sectors apply to this tender:

- Electrical and telecom cables - 90%
- PPE

Tenderers need to complete and submit Annexure F1-F4 hereto as evidence of compliance with this requirement. The DTI has appointed SABS as the official verification agency for local content in terms of designated products.

A tender that fails to meet the minimum stipulated threshold for local production and content shall be disqualified.

4.3 Subcontracting

4.3.1 Preferred subcontractors

As per the PPPFA regulations, if feasible to subcontract for a contract above R30 million, an organ of state shall apply subcontracting to advance designated groups.

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The condition of contract is that the contractor must subcontract a minimum of 30% of the value of the contract to:

- (a) an EME or QSE.
- (b) an EME or QSE which is at least 51% owned by black people.
- (c) an EME or QSE which is at least 51% owned by black people who are youth.
- (d) an EME or QSE which is at least 51% owned by black people who are women.
- (e) an EME or QSE which is at least 51% owned by black people with disabilities.
- (f) an EME or QSE which is 51% owned by black people living in rural or underdeveloped areas or townships.
- (g) a cooperative which is at least 51% owned by black people.
- (h) an EME or QSE which is at least 51% owned by black people who are military veterans; or
- (i) more than one of the categories referred to in paragraphs (a) to (h).

4.3.2 Subcontract documentation, and assessment of subcontract tenders

Preference is given to South African companies as possible subcontractors and where possible, local resources are utilised. Where it is feasible to sub-contract to either an EME or QSE) and Regulation 4 (where the B-BBEE Level Contribution of sub-contractor must be minimum Level 4) and this shall form part of the mandatory prequalification criteria.

The value attributed to such enterprises is monitored by the *Contractor* and submitted to the *Project Manager* by means of a 3-monthly statement of expenditure.

Preferred subcontractors for the externally owned sites are to be confirmed and coordinated by the *Contractor*.

4.3.3 Subcontract documentation, and assessment of subcontract tenders

All subcontractors are contracted on a back-to-back basis under appropriate NEC conditions of contract and are subject to acceptance by the *Project Manager*. Where NEC conditions of contract are not utilised, the proposed conditions of contract are submitted to the *Project Manager* for acceptance.

In terms of the Construction Regulations, the *Contractor* only appoints a subcontractor when the *Contractor* is satisfied that such a subcontractor has the necessary competencies and resources to perform the work falling within the scope of the subcontract safely.

The *Contractor* is required to:

- Stop any subcontractor from executing construction work which is not in accordance with the *Contractor's* or subcontractor's health and safety plan for the Site or which poses a threat to the health and safety of persons.
- Ensure that every subcontractor:
 - is registered and in good standing with the compensation fund or with a licensed compensation insurer prior to work commencing on the Site; and
 - have made provision for the cost of health and safety measures during the construction process.

4.3.4 Limitations on subcontracting

Subcontractors reporting relationships are such that quality outputs and independence is assured eg. a radiography subcontractor cannot report to the welding subcontractor. These relationships are such that the *Contractor* has full control of all subcontractor outputs. Subcontractors contracting to subcontractors are to be avoided as far as possible. Exceptions are only allowed with the explicit acceptance of the *Project Manager*.

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4.3.5 Nuclear safety

The *Contractor* establishes and maintains vigorous oversight over its subcontractors to assure adherence to this Works Information and its requirements and thereby achieve nuclear safety. The *Contractor* complies with RD-0034 in the selection, qualification, and management of his subcontractors.

4.4 Plant and Materials**4.4.1 Quality**

Quality requirements relating to Plant and Materials shall be developed and identified, by the *Contractor*, and accepted, by the *Project Manager*, as part of the Procurement Specification of the Installation Design – which shall include the Bill of Material.

4.4.2 Counterfeiting

The *Contractor* warrants that all items provided to Provide the Works is genuine, new and unused. The *Contractor* further warrants that all items used to Provide the Works, include all genuine, original or are otherwise suitable for the intended purpose.

Types of material, parts, and components, known to the *Employer*, to have been misrepresented internationally include (but are not limited to):

- fasteners.
- hoisting, rigging, and lifting equipment.
- cranes.
- hoists.
- valves.
- pipe and fittings.
- electrical equipment and devices.
- plate, bar, shapes, channel members, and other heat-treated materials and structural items.
- welding rod and electrodes; and
- computer memory modules.

The *Contractor's* warranty extends to labels and/or trademarks or logos affixed, or designed to be affixed, to items supplied or delivered to Provide the Works.

Falsification of information or documentation may constitute criminal conduct, the *Employer* may reject and retain such information or items, identify, and segregate such information or activities, at no additional cost to the *Employer*.

The *Employer* shall also report such information or activities to relevant South African governmental officials.

4.4.3 Plant & Materials provided “free issue” by the *Employer*.

None

4.4.4 *Contractor's* procurement of Plant and Materials

The *Employer* requires warranties from suppliers to be in favour of the *Employer* and not just to the *Contractor*. Where provided warranties from suppliers exceed the Defects Date, those warranties are passed on to the *Employer*. All *Contractor's* supplier data which the *Employer* may need after Completion of the whole of the *works* is supplied to the *Employer* at delivery.

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4.4.4.1 Procurement: Equipment, Plant and Materials and consumables

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Compilation and submittal of manufacturing quality plans to the <i>Project Manager</i> for indication of hold and witness points and approval.		X	<ul style="list-style-type: none"> Manufacturing quality plans are in accordance with the <i>Employer</i> Quality Requirements. 	In accordance with Accepted Programme	Not applicable to third party "off the shelf" Equipment, Plant and Materials.
Manufacturing Quality plans to be submitted to the <i>Employer's</i> PQE and QA/QC sections for indication of <i>Employer's</i> hold and witness points.	X		<ul style="list-style-type: none"> Indication of <i>Employer's</i> requisite "hold" and "witness" points and acceptance. 	Within 4 weeks of receipt of notification.	
Manufacturing and procurement of equipment, Plant and Materials.		X	<ul style="list-style-type: none"> In accordance with the requirements of the applicable codes, standards, and quality requirements of the accepted design. For long lead items, which require to be purchased prior to acceptance of the Installation Design, the <i>Contractor</i> obtains <i>Employer's</i> acceptance prior to placement of such orders and include such items in the Programme. 	In accordance with Accepted Programme	
Notification of <i>Employer's</i> hold and witness points.		X	<ul style="list-style-type: none"> Notification to <i>Project Manager</i> 	Local – 1 week Foreign – 2 weeks	
Equipment, Plant and Materials packaging.		X	<ul style="list-style-type: none"> In accordance with the requirements of the applicable codes, standards, and quality requirements of the accepted design. An itemised detailed packing list must be compiled for each shipment and sent to the <i>Employer</i> electronically in advance. The packing list must be made up using the following columns: <ul style="list-style-type: none"> Tracking devices & numbers for GPS Box number Item number Quantity Equipment Description SAP 45 Order No Storage Level 	In accordance with Accepted Programme	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Preparation of equipment, Plant and Materials for shipment (Packaging/Crating).		X	<ul style="list-style-type: none"> • Any items brought onto Site must be packaged in such a manner as to prevent damage during transportation and degradation due to environmental effects. • Each crate must be identified with a label stating: <ul style="list-style-type: none"> – Project Title – Koeberg Operating Unit – Attention: The <i>Supervisor</i> [specify name and tel. number] – The <i>Employers</i> modification number – SAP 45 Order No – Storage requirements • Inside the crate each box must be identified in accordance with the packing list. Items in the box to have all relevant documentation and certificates. 	In accordance with Accepted Programme	
Notification of shipment to be performed.		X	<ul style="list-style-type: none"> • The <i>Contractor</i> formally sends the following information to the <i>Project Manager</i>: <ul style="list-style-type: none"> – Shipping Agent Name – Description of items to be shipped. – Value of shipment – Weight of shipment – Port of shipment – The vessel/flight name – The departure dates. – The arrival date 	In accordance with Accepted Programme	
Transportation to storage facility at KOU and subsequent transportation to the point of implementation (including all related rigging and lifting equipment and activities).		X	<ul style="list-style-type: none"> • Incoterms: Delivered Duties Paid (where applicable). 	In accordance with Accepted Programme	Allow 2 weeks for customs clearance in South Africa (where applicable).

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Provision of equipment, Plant and Materials QADP's for customs clearance and receipt inspections		X	<ul style="list-style-type: none"> • The <i>Contractor</i> provides with each shipment a summary sheet which contains: <ul style="list-style-type: none"> – the bill of material for the shipment, – a description of the equipment and – the total price for each item on the bill. • The summary sheet also reflects the contract reference number and the name of the <i>Project Manager</i>. 	In accordance with Accepted Programme	Individual items are marked in accordance with the Contract and Works Information.
Unpacking on Site		X	<ul style="list-style-type: none"> • The <i>Contractor</i> coordinates this activity. • Crate opening to be witnessed by the <i>Supervisor</i> 	In accordance with Accepted Programme	
Verification of equipment, Plant and Materials to specification and preparation for marking by the <i>Supervisor</i> .		X	<ul style="list-style-type: none"> • Upon delivery, the <i>Contractor</i> prepares such Plant, Materials and Equipment that are identified for payment in the <i>activity schedule</i>, for the <i>Supervisor</i> to mark. • As part of preparation for marking (where applicable and as directed by the <i>Project Manager</i>) the <i>Contractor</i> shows title of such Plant, Materials, and equipment to the <i>Supervisor</i>. Demonstration by the <i>Contractor</i> of such title is a prerequisite to marking and payment. • Preparation for marking includes: <ul style="list-style-type: none"> – Marking for the attention of the <i>Supervisor</i> – Item Number – corresponding to that on the packing list. – Bill of Material number – The contract number and title – SAP 45 Order number – Level of storage requirements – Shelf life 	Notification 4 weeks prior to delivery to Site	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Receipt inspection / acceptance of equipment, Plant and Materials.	X		<ul style="list-style-type: none"> Surveillance report supplied by <i>Employer</i> PQA (Project Quality Assurance). The <i>Contractor</i> provides the <i>Employer's</i> PQE staff with the bill of material reference number(s) of the equipment, Plant and Materials inspected – these are to be included on the surveillance report. The <i>Contractor</i> ensures that the applicable surveillance report number is referenced in the “As-Built” BOM for traceability reasons. The surveillance report numbers are used as index for all QADPs submitted with equipment, Plant and Materials and are transmitted to the <i>Project Manager</i> as part of the End of Implementation Reports. 	1 day duration	The <i>Supervisor</i> marks the equipment, Plant and Materials after preparation for marking by the <i>Contractor</i> .
Procurement of all consumables excluding welding rods, filler wire and welding gas.		X	<ul style="list-style-type: none"> All consumables such as grinding discs, marking pens, dye penetrant, developer etc. used directly for the <i>works</i> are CRACK compliant in accordance with DSG-317-094 	In accordance with Accepted Programme	
Conclusion	X	X	<ul style="list-style-type: none"> This activity group is complete upon issuing of the “Surveillance Report” by the <i>Employer</i>. 	In accordance with Accepted Programme	Deliverables: <ul style="list-style-type: none"> Manufacturing Quality Plans Packing Lists All equipment, Plant and Materials and consumables with applicable quality assurance data packages and associated surveillance reports.

4.4.4.2 Procurement: Storage of equipment, Plant and Materials

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Provision of plans for laydown areas and conservation requirements for storage.		X		Notification 6 months prior to delivery to Site	
Arrange storage space and notify <i>Contractor</i> of storage available.	X		<ul style="list-style-type: none"> <i>Supervisor</i> arranges. 	Within 6 weeks of receipt of notification	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Notify <i>Project Manager</i> if storage space not suitable.		X		Within 2 weeks from <i>Employer's</i> response	To allow sufficient time for the <i>Employer</i> to arrange alternative facility.
Provision of suitable Storage Area	X			In accordance with Accepted Programme	
Moving of equipment, Plant and Materials and related support services (i.e., rigging) to and from receipt inspection area, storage facility, laydown areas and Site.		X		In accordance with Accepted Programme	
Tracking and control of equipment, Plant and Materials.		X		In accordance with Accepted Programme	
Conclusion	X	X	<ul style="list-style-type: none"> This activity group is complete upon agreement of a suitable storage area. 	In accordance with Accepted Programme	Deliverables: <ul style="list-style-type: none"> Laydown plans Allocated storage areas

4.4.5 Spares and consumables.

4.4.5.1 Spares

The *Contractor* supplies any spares which may be required for and during commissioning of the *works*. These spares, if unused, are handed over to the *Employer* at Completion.

The *Contractor* provides a recommended list of spares with each unit priced and the relevant support information as required by KAA-614 Revision 7, for at least 20 years of operation.

For the recommended list of spares, the *Contractor* provides the basis for spares inventory with specific reference to critical spares.

When applicable, the *Contractor* delivers spares to the Site stores and in liaison with the *Project Manager* and supplies the data necessary for booking spares into stores.

4.4.5.2 Consumables

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Welding Consumables Verification and Reservation		X	<ul style="list-style-type: none"> The <i>Contractor</i> shall <i>specify</i> the requirements in terms of welding consumables, limited to welding rods, filler wire and gas, and provide reservation request to the <i>Project Manager</i>. 	To-12 wks.	To: implementation starting date
Welding consumables	X		<ul style="list-style-type: none"> Welding consumables are provided by the <i>Employer</i>. 	In accordance with Accepted Programme	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Consumables handling and control		X	<ul style="list-style-type: none"> Hazardous substances and materials are handled in accordance with the <i>Employer's</i> relevant process procedure and are ensured by the <i>Contractor's</i> Responsible Person. 	As required	

4.5 Tests and inspections before delivery

Specific hold and witness points shall be assigned by the *Employer* as part of its acceptance review of the manufacturing and testing quality control plans prior to start of any tests and inspections.

The *Contractor* shall comply with all requirements defined in the *Employer's* works information.

4.6 Marking Plant and Materials outside the Working Areas

Not applicable

4.7 Contractor's Equipment (including temporary works).

The *Contractor* shall comply with all requirements defined in the *Employer's* works information section 5.5.2 (Spares and Special Tools)

4.8 Cataloguing requirements by the Contractor

Not applicable

5 Construction

The following sections provide additional requirements and constraints relating to construction.

5.1 Notification of construction work

The Construction Regulations require that the *Contractor*, as the main contractor, inform the provincial director of the Department of Labour before carrying out any work on the Site where the work:

- Involves the demolition of a structure exceeding a height of three meters, the use of explosives or the dismantling of fixed plant at a height greater than three meters.
- Exceeds 30 days or shall involve more than 300 person days of construction work and includes excavation work deeper than one meter: or working at a height greater than three meters above ground or a landing.

5.2 Work plan and test procedures

All construction activities shall be governed by means of an accepted Work Plan in accordance with the requirements stated below.

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Verification of all drawings and plant layout		X	<ul style="list-style-type: none"> • Applicable to accessible plant items, components, and systems only. • The <i>Contractor</i> performs walkdowns of all areas to identify all the risks. Photos are to be taken of the work areas and areas where the <i>Contractor</i> shall be tying into existing plant. • The inclusion of these photos into the Work Plan and/or SHE Risk Assessment is strongly recommended. 	In accordance with Accepted Programme	For instance, the <i>Employer</i> requires a photo when drilling a hole on both sides of the wall to ensure that nothing on the other side is damaged.
Raise SAP Requests for Notifications, Orders and Operations to be included in <i>Employer's</i> SAP planning system.		X	<ul style="list-style-type: none"> • SAP request notifications, orders and operations are raised in compliance with KGA-020. • The SAP request forms are completed by a person with detailed knowledge of exactly what work is to be completed for the specific request – reference to QCPs shall not suffice as the <i>Employer's</i> work controllers must understand the scope and nature of work to be performed. • Where limited conditions of operation (LCOs) are entered, these must be clearly stated on the SAP request. 	To-8 months	To integrate the <i>Contractor's</i> activities with the <i>Employer's</i> plans, it is required that SAP notifications, orders and operations be raised on the <i>Employer's</i> SAP system.
Raise SAP Notifications, Orders and Operations	X		<ul style="list-style-type: none"> • In accordance with <i>Contractor's</i> SAP Requests. • The <i>Contractor</i> provides the required updates, and the <i>Employer</i> maintains and updates the SAP orders, notifications, and operations. 	To-7 months	The SAP orders needs to be raised early enough to include the numbers in the Work Plan.

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<p>Compilation, independent review, and approval of the Work Plan together with Contractor's and Subcontractor's approved quality control plans (QCPs).</p>		<p>X</p>	<ul style="list-style-type: none"> • The Work Plan addresses all requirements stated in the <i>Employer's</i> Work Plan template – KFA-002. The Work Plan is sufficiently detailed and clearly shows all the work required to Provide the Works. Due to the nature of this specific project, the <i>Contractor</i> includes in its Work Plan a unit-specific: <ul style="list-style-type: none"> – Rigging Plan. – Scaffolding Plan • The <i>Contractor</i> completes the <i>Employer's</i> Work Plan template (KFA-002) and provides reference to the <i>Contractor's</i> and subcontractor's QCPs and installation plans. • All static testing - testing that does not require energisation of the system or components i.e., liquid penetrant, radiography, and wire-to-wire testing – is incorporated in the Work Plan. • The Work Plan is supplied with a detailed schedule to indicate main activities (in accordance with the Accepted Programme) with sufficient detail for integration into the <i>Employer's</i> outage plan. The detail required for integration within the <i>Employer's</i> outage plan are: <ul style="list-style-type: none"> – Plant state requirements and (any) system dependencies – Predecessors and successors – Physical duration of the main activity – Working times (calendar) and associated resources. • Risk and (where applicable) ALARA assessments, as required by the Work Plan is performed by authorised <i>Contractor</i> personnel only. • When working in relaying, switchboards, KRG, KIT the <i>Contractor</i> analyse the risk of tripping the whole board, as well as the cell above, below and on the sides of the areas where work is performed. • All SAP orders raised on the <i>Employer's</i> database for installation of the modification are included in the Work Plan. • All equipment, Plant and Materials listed for installation has a space for documenting the <i>Employer's</i> surveillance report numbers and/or the <i>Contractor's</i> receipt inspection number. This shall allow traceability of all Plant and Materials installed with its associated QADPs. • Intrusive work is classified and controlled in compliance with the 	<p>In accordance with Accepted Programme</p>	
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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
			<p><i>Employer's</i> Foreign Material Exclusion Procedure KAA-069.</p> <ul style="list-style-type: none"> The <i>Contractor</i> provides a record of the independent review performed. It is an <i>Employer's</i> requirement that the Work Plan be reviewed by the <i>Contractor's</i> engineering representative (the designer or one of the design reviewers), involved in the compilation, review and/or approval of the Installation Design; to confirm compliance with the accepted Installation Design. 		
<p>Compilation, independent review, and approval of test procedure(s) with <i>Contractor</i> and subcontractor's accepted procedures.</p>		<p>X</p>	<ul style="list-style-type: none"> The test procedure(s) addresses all requirements stated in the <i>Employer's</i> test procedure template – KFA-006 (. . .) The <i>Contractor</i> completes the <i>Employer's</i> template (KFA-006) and provides reference to the <i>Contractor's</i> and subcontractor's testing and commissioning procedures. Testing and commissioning shall verify component functional testing (e.g., motor directional tests, logic function tests, etc.) as well as overall system integrated commissioning test that shall verify that: <ul style="list-style-type: none"> the installation meets the functional and performance requirements and environmental specification of the accepted design. the installation functions correctly with all interfacing plant systems. The test procedure(s) is/are sufficiently detailed and clearly shows all the work required to Provide the Works. Each test procedure is supplied with a detailed schedule to indicate main activities (in accordance with the Accepted Programme) with sufficient detail for integration into the <i>Employer's</i> outage plan. The detail required for integration within the <i>Employer's</i> outage plan are: <ul style="list-style-type: none"> Plant state requirements and (any) system dependencies Predecessors and successors Physical duration of the main activity Working times (calendar) and associated resources. 	<p>In accordance with Accepted Programme</p>	<p>It is permitted that accepted <i>Contractor's</i> and subcontractor's procedures are attached/referenced in the test procedure(s).</p>

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
			<ul style="list-style-type: none"> All SAP orders raised for testing of the modification are referenced in the test procedure. The <i>Contractor</i> provides a record of the independent review performed. It is an <i>Employer's</i> requirement that the test procedures be reviewed by a <i>Contractor's</i> engineering representative (the designer or one of the design reviewers), involved in the compilation, review and/or approval of the Installation Design; to confirm compliance with the accepted Installation Design. 		
Submit the Work Plan and test procedures for <i>Employer</i> 1 st acceptance review.		X	<ul style="list-style-type: none"> All QCPs, installation plans and test procedures are to be submitted – including subcontractor documents. The <i>Project Manager</i> shall not accept the Work Plan and test procedures for <i>Employer's</i> review without all the supporting documentation being approved and available and submitted together. 	In accordance with Accepted Programme	Submitted to <i>Project Manager</i> .
1 st Acceptance review from <i>Employer</i>	X		<ul style="list-style-type: none"> The <i>Contractor</i> attends a review meeting (where applicable) to discuss <i>Employer</i> review comments. 	Within 3 weeks of submittal.	This is to ensure that the <i>Employer</i> review comments are well understood by the <i>Contractor</i> .
Initiate KAM-038 impact assessment review.	X		<ul style="list-style-type: none"> Internal activity 	Internal activity	
Address <i>Employer's</i> review comments		X	<ul style="list-style-type: none"> The <i>Contractor</i> addresses all the agreed and accepted review comments of the <i>Employer</i>. 	In accordance with Accepted Programme	
2 nd Acceptance review submittal for review		X		In accordance with Accepted Programme	Submitted to <i>Project Manager</i> .
2 nd Acceptance review from <i>Employer</i>	X		<ul style="list-style-type: none"> The <i>Employer</i> may raise additional review comments not identified during the first review. A review meeting may be requested, at the discretion of the <i>Project Manager</i>, depending on the number and nature of comments identified / resolved. 	Within 2 weeks of submittal.	
Address <i>Employer's</i> comments and submit for final acceptance.		X		In accordance with Accepted Programme	Submitted to <i>Project Manager</i> .
<i>Employer</i> acceptance of Work Plan and test procedures.	X		<ul style="list-style-type: none"> Acceptance is subject to all the <i>Employer's</i> comments being adequately addressed. 	Within 1 week of submittal.	Cover sheet needs modification to allow for signatures.

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Conclusion	X	X	<ul style="list-style-type: none"> This activity group is complete upon the <i>Employer's</i> acceptance of the installation plan and test procedure(s). 	In accordance with Accepted Programme	Deliverables: <ul style="list-style-type: none"> Work Plan (reviewed and approved with signatures) ALARA assessment (where applicable) Risk Assessment Unit specific Rigging Plans Unit specific Scaffolding Plans Isolation Plan SAP notifications, orders Implementation and Testing Schedules (including pre-outage work – where applicable) Test procedure(s).

5.3 Implementation approval

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Verification and completion of "Design Change Package Implementation Approval" form	X		<ul style="list-style-type: none"> In accordance with KFA-035. 	In accordance with Accepted Programme	
Preparation of KORC/KOSC presentation for implementation approval.		X	<ul style="list-style-type: none"> The KORC presentation covers the Safety Case and implementation approval. The <i>Contractor</i> compiles a KOSC presentation that details the Work Plan and includes all risks identified for the works and associated preventive/contingent actions are included for information as part of this presentation. The use of pictures to demonstrate that plant walk-downs were performed is compulsory. This shall also aid the <i>Employer's</i> KOSC members to fully understand the <i>works</i> to be performed. 		

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Presentation to <i>Employer's</i> approval authorities (KORC/KOSC)	X		<ul style="list-style-type: none"> The <i>Project Manager</i> arranges with KORC/KOSC secretaries, the opportunity to present information. The <i>Employer</i> performs the presentation. The <i>Contractor</i> supports the <i>Employer</i> in the presentation. 	In accordance with Accepted Programme	Regular meetings are scheduled every Monday but arrangement of special KORC meetings is possible for urgent issues.
Liaison with NNR	X		<ul style="list-style-type: none"> The <i>Contractor</i> responds to one round of questions raised by the National Nuclear Regulator (NNR). The <i>Contractor</i> supports the <i>Employer</i> in responding to questions. Clarifications regarding the 1st response are not considered as additional questions, but part of the 1st round of questions. The <i>Contractor</i> does not communicate directly to the NNR unless agreed, or in liaison, with the <i>Project Manager</i>. 	In accordance with Accepted Programme	The <i>Employer</i> interfaces with the NNR. <i>Contractor</i> addresses questions.
NNR approval	X		<ul style="list-style-type: none"> <i>Contractor</i> provides support 	16 weeks duration	
Conclusion	X	X	<ul style="list-style-type: none"> This activity is complete upon approval for installation from the NNR. 	In accordance with Accepted Programme	Deliverables: A duly signed "Design Change Package Implementation Approval" form - KFA-035 KORC/KOSC presentation NNR letter of approval for installation.

5.4 Temporary works, Site services & construction constraints

5.4.1 *Employer's* Site entry and security control, permits, and Site regulations.

Prior to access to Site, the *Contractor* passes through various security check points, viz. entrance at the R27 access gate, entrance at the Duynefontein entrance, Access Control Point 1 (ACP-1) as well as Access Control Point 2 (ACP-2) where security checks are performed.

All temporary worker/visitor permits are issued at ACP-1.

5.4.2 Restrictions to access on Site, roads, walkways, and barricades.

All Equipment and tools are subject to a security screening before they are allowed on the Site. All Equipment and tools must be listed and specified before they are brought on Site. This list shall serve as evidence for removal permits upon Completion of the *works*. Vehicles are only allowed on Site if justification is provided to the *Project Manager* that such a vehicle is essential to Provide the Works.

5.4.3 Health and safety facilities on Site

The *Employer* maintains a first aid and clinic facility which is available for treating minor medical problems. Contractors are permitted to make use of this facility at their own expense if they appear during prescribed consulting hours and are duly authorised by the *Contractor* supervisor. Emergency treatment is provided as needed. Casualty facilities are available at hospitals within a 25km radius.

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5.4.4 Site records

The *Contractor* maintains and submits current records of activities, including the work of Subcontractors.

These *Contractor's* records include:

- Identification of *Contractor* / Subcontractor work and the area of the Site (Work performed to date giving the location, description and by whom, and reference to the Accepted Programme).
- Equipment with hours worked, idle or down for repair.
- Test results and references to specification requirements. List deficiencies identified, together with the corrective action.
- Plant and Material received with statement as to its acceptability and storage.
- Job safety evaluations.
- Progress photographs.
- A list of instructions given and received and any conflicts in plans and/or specifications.
- Weather conditions encountered.
- The number of persons working on-site by trade, activity, and location (Visitors are highlighted separately).
- Information required from and by the *Employer* / *Project Manager* / *Supervisor*.
- Any delays encountered, identifying possible root cause.

5.4.5 Heat stress & confined space entries (where applicable)

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Supply of required protective clothing (coveralls, overshoes, etc.)		X	<ul style="list-style-type: none"> • Based in international experience feedback, it is strongly recommended that burnable clothing is not worn in a heat stress zone. • The <i>Contractor</i> is to propose the specific PPE to be used for workers for work 		
Respiratory protection	X		<ul style="list-style-type: none"> • Respirators, air-supply suits, SCBA, etc. • The <i>Contractor</i> issues a reservation request for said equipment. 	12 weeks prior to use	
Supply of calibrated and checked oxygen monitors		X		As required	
Supply of portable ventilation units		X		As required	

5.4.6 Title to materials from demolition and excavation

The *Contractor* has no title to materials from excavation and demolition.

5.4.7 Removal and disposal of redundant / replaced Plant and Materials (as applicable)

The *Contractor* removes and disposes, from Site, all redundant Plant and Materials on a regular basis and ensures the Site is clean and tidy.

5.4.8 Cooperating with and obtaining acceptance of Others

The *Project Manager*, in conjunction with the *Supervisor*, co-ordinates the work of Others on Site. The *Contractor* co-operates with and does not delay, impede, or otherwise impair the work of Others.

5.4.9 Publicity and progress photographs

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Written acceptance from the *Project Manager* is required prior to:

- The issue of photographs, even if included in a report or submission, to a third party,
- Any publication on notice boards, advertising, media relations, and photography and progress photographs.

5.4.10 Tools, test equipment & consumables

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Supply of standard tools as well as all specialised tools		X	<ul style="list-style-type: none"> • Specialised tools are supplied by the <i>Contractor</i>. • In the case where specialised tools are to be manufactured specifically for KOU, the <i>Employer</i> shall take ownership of the tools after Completion of the <i>works</i> on the last unit. • After implementation on the first unit, the <i>Contractor</i> makes available the specialised tools for any maintenance that might be required by the <i>Employer</i>. 	As required	
Supply of standard test equipment as well as all specialised test equipment (including specialised calibration tools and equipment).		X	<ul style="list-style-type: none"> • Specialised test equipment is supplied by the <i>Contractor</i>. • In the case where specialised test equipment must be manufactured specifically for KOU, the <i>Employer</i> shall take ownership of the tools after Completion of the <i>works</i> on the last unit. • After implementation on the first unit, the <i>Contractor</i> makes available the specialised test equipment for any testing that might be required by the <i>Employer</i>. 	As required	Any additional special equipment furnished by the <i>Contractor</i> , which cannot be recovered (whether decontaminated or not), shall be for the <i>Contractor's</i> account.
Conclusion	X	X	<ul style="list-style-type: none"> • This activity group is complete upon take over. 	In accordance with Accepted Programme	Deliverables: Tools and test equipment that may not be recoverable.

5.4.11 Special Equipment for irradiated areas (as applicable)

The *Contractor* must ensure that all arrangements for decontamination or disposal be taken care of in the event any Equipment cannot be decontaminated, as per regulations.

5.4.12 Control of radioactive Equipment, Plant or Material (as applicable)

Prior to Equipment, Plant or Materials that is to be used in the *Employer's* Site radiological control zones, being brought onto the *Employer's* Site, the *Contractor*.

- obtains the *Project Manager's* acceptance of a Radiological Surveillance Report, provided by the *Contractor*, which details the radiological conditions/cleanliness of the Equipment, Plant or Materials in terms of dose rate and contamination level (fixed/loose); and
- makes available such Equipment, Plant or Materials for scrutiny by the *Employer's* RP Group, when first unpacked/unfolded/uncontained from its original shipment packing.

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5.4.13 Contractor's Equipment

All Equipment and tools must be listed and specified before they are brought on Site. This list serves as evidence for removal permits upon Completion of the *works*.

5.4.14 Equipment provided by the Employer.

The *Employer* provides no Equipment.

5.4.15 Site services and facilities**5.4.15.1 Electric power supplies**

Electric power for construction is supplied free of charge, but connection fees are for the *Contractor's* account. All installations comply with the details set out under Construction Power Supplies, OH&SA (Act 85 of 1993).

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Electrical supply point	X		<ul style="list-style-type: none"> Power supply points shall be made available to which the <i>Contractor</i> interfaces for his power requirements. Three levels of power supplies are available: <ul style="list-style-type: none"> 220V AC rated at 15 A at various positions on Site, 380V AC three phase rated at 32 A without neutral at various positions on the Site, 6.6 KV AC three phase at various positions on the Site. 	As required	The <i>Employer</i> does not guarantee continuity of supply and no compensation events for standing time because of power failures shall be considered.
Electrical leads and adapters / connectors and (where required) distribution system.		X	<ul style="list-style-type: none"> All leads, plugs, connections and adapters shall be in good working order and comply with the requirements of the OH&S Act. All portable electrical equipment used by the <i>Contractor</i> is clearly marked; regularly inspected for safety and a register kept of these inspections as required by the OH&S Act. Defective Equipment is removed from Site until restored to a good working order by the <i>Contractor</i>. The <i>Contractor</i> provides and maintains an electrical distribution system (including temporary wiring, cabling, distribution boards, protection, metering etc.) to lead power from the <i>Employer's</i> supply point, to where it is required. On Completion the <i>Contractor</i> removes all such temporary distribution systems (included as part of the Work Plan). 	As required	The <i>Project Manager</i> reserves the right to stop the <i>Contractor's</i> use of any electrical equipment or appliance that in the <i>Project Manager's</i> opinion does not conform to the foregoing.

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5.4.15.2 Lighting

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Temporary local lighting		X	<ul style="list-style-type: none"> Where applicable, the <i>Contractor</i> provides temporary local lighting in accordance with the safety requirements of the Occupational Health and Safety Act. 	As required	The <i>Employer</i> provides no additional lighting other than the local lighting installed and does not guarantee the serviceability or the availability of these installations.

5.4.15.3 Water

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Water supply point	X		<ul style="list-style-type: none"> Potable water is supplied at standard tapping points. 	As required	The <i>Employer</i> takes no responsibility for disruptions in the supply of water.
Water supply hoses, connectors, piping and temporary plumbing and pumps.		X	<ul style="list-style-type: none"> All devices shall be in good working order and comply with the requirements of the OH&S Act. The <i>Contractor</i> provides and maintains all pipework and temporary plumbing and pumps necessary to lead the water from the <i>Employer's</i> points of supply to the various points where it is required. On Completion the <i>Contractor</i> removes such pipework, temporary plumbing, and pumps (included in the Work Plan). 	As required	

5.4.15.4 Sanitary facilities

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Sanitary facilities	X		<ul style="list-style-type: none"> The <i>Contractor</i> is allowed access to and use of the <i>Employer's</i> existing sanitary facilities. The <i>Contractor's</i> personnel maintain a clean condition of these facilities. Should temporary sanitary facilities be required, the <i>Contractor</i> provides these. 	Not applicable	

5.4.15.5 Office accommodation and/or yard

The *Contractor* is held liable for any damage to the *Contractor's* facility during the period of occupation. It is imperative that the *Contractor's* facilities checklist be verified prior to occupation and upon departure, as this remains proof of any damage to the facility, which needs to be repaired by the *Contractor*. All expenses

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incurred by the *Employer* in the event of having to perform repairs are at a fee that is in line with the current building tariffs and be charged for the *Contractor's* account.

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Indication of site office requirements for various stages of the project including the office services required.		X	<ul style="list-style-type: none"> Request to be for services in accordance with the requirements of this contract. 	12 weeks' notice	
Review of request and indication of offices available and container lay-down areas available.	X			2-week duration	The <i>Contractor</i> shall be allocated an area on a concrete slab within the security area for establishment of his site office facility.
Supply of connection points for phone, fax, network, and electrical supply.	X		<ul style="list-style-type: none"> Co-ordination and scheduling by <i>Contractor</i>. 	As required	
Supply of containers / Office space		X	<ul style="list-style-type: none"> <i>Contractor</i> to co-ordinate. 	2 months' notice	This is for temporary container laydown area which the <i>Project Manager</i> shall designate. The <i>Contractor</i> to furnish his specifications.

5.4.15.6 Garbage collection

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Garbage collection	X		<ul style="list-style-type: none"> A central garbage collection point is provided on the Site and is pointed out by the <i>Project Manager</i> on request from the <i>Contractor</i>. No facilities are provided for the removal of construction debris. The <i>Contractor</i> is responsible for the removal of all construction debris/scrap from Site to the central garbage collection point. 	Not applicable	

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5.4.15.7 Compressed air supply

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Compressed air supply point	X		Compressed air is supplied at 6 to 8 bar(g) at standard air supply points on the plant. All air points at the Site are equipped with staubli quick connecting valves. The <i>Contractor</i> provides and maintains all connections and fittings (male staubli connector to be fitted to <i>Contractor's</i> equipment by the <i>Contractor</i>).	N/A	The <i>Employer</i> takes no responsibility for disruptions in the supply of compressed air.
Air supply hoses and connectors		X	All air hoses and connections shall be in good working order and comply with the requirements of the OH&S Act.	As required	

5.4.15.8 House keeping

The *Contractor* is responsible for any damage to buildings, floors and plant incurred during the Provision of the Works. The worksites are to be kept clean, neat and free of waste at all time. The *working areas* and material storage areas are barricaded off and sign-posted to prevent access to anyone not involved with the job. The plant is left in the same or better condition, after Completion, than it was found.

5.4.15.9 Personal computers

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Supply of phones, faxes and computers including the microwave or radio link for connection to the external internet networks.		X	N/A	In accordance with Accepted Programme	No cellular or mobile phones are allowed on Site.

5.4.15.10 Canteen and snack bar

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Canteen, snack bar and vending supplies	X		<ul style="list-style-type: none"> The <i>Employer's</i> canteen and snack bar may only be used on a cash basis. The <i>Contractor</i> supplies vending machines if required. 	Not applicable	

5.4.15.11 Telephones

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Telephone and Fax account payments and LAN account payments		X	<ul style="list-style-type: none"> • <i>Contractor</i> to provide his own communication tools and equipment 	As required	

5.4.16 Facilities provided by the Contractor.

The *Contractor* provides all facilities to Provide the Works. Facilities provided by the *Contractor* are removed prior to Completion.

5.4.17 Existing premises, inspection of adjoining properties and checking work of Others.

The *Contractor* is required to take the following special precautions whilst executing the *works*:

- Barricades between the work area and the remainder of the plant (if used) are kept in place and must be always respected by the *Contractor's* staff.
- All existing services in the area of the *works* shall be operational during the period of the contract and at no time shall the *Contractor* be permitted to move or disturb these services. It is a requirement of the contract that the *Contractor* perform the *works* within the constraints of these services.
- The *Contractor* ensures that all plant and associated systems are protected from sustaining damage, of any form whatsoever, during the *works*.
- The *Contractor* ensures that all existing services such as cables; instrumentation; cable trays; fire barriers and pipe work that may be damaged during installation have been identified and where possible relocated away from possible harm. However, due to the limited space available such relocation of services may be impractical and could still result in restricted working space available to the *Contractor*.

5.4.18 Survey control and setting out of the works.

The *Contractor* participates in the mandatory Site visit to view the Site and associated constraints. The *Contractor* provides its requirements for any related survey control and setting out of the *works* in the *Contractor's* Works Information – submitted as part of the tender.

Further details are developed, by the *Contractor*, as part of the Work Plan as stated in this works Information.

5.4.19 Excavations and associated water control

Not applicable to this scope of work.

5.4.20 Underground services, other existing services, cable, and pipe trenches and covers.

Not applicable to this scope of work.

5.4.21 Control of noise, dust, water, and waste

Contractor to develop waste removal plan and disposal of removed waste according to KAE-012 Rev 8 – Hazardous and non-Hazardous waste and scrap disposal requirements.

5.4.22 Sequences of construction or installation

Sequencing of construction activities are established as part of the Work Plan development and submitted with the Work Plan.

5.4.23 Giving notice of work to be covered up.

The *Contractor* gives 24-hour notice, prior to work being covered up, of any inspections the *Supervisor* needs to perform on Site. Should the *Contractor* require inspections off Site, the *Contractor* allows for enough time to enable the *Supervisor* to make travel arrangements, following the *Contractor's* notification.

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5.4.24 Hook ups to existing works

Where hook-ups to existing works are required, the impact and effect of such hook-ups are detailed in the Installation Design and specific requirements identified in the Work Plan.

5.4.25 Change Management during Implementation

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Compilation of Discrepancy Report.		X	<ul style="list-style-type: none"> Any deviation from any of the accepted designs, changes to Work Plans and/or test procedure(s) identified during implementation and /or testing are documented, analysed, and approved and the impact on configuration updated. As per 331-86, a Discrepancy Report (DR) may be used by the <i>Contractor</i> to notify the changes. 	1 working day.	<p>The DR is a notification, tracking and control tool for discrepancies encountered during the installation and testing and commissioning stages of the project, however, the design (as-built) change must be formalised by means of a design revision update at completion of the works.</p> <p>The following is to be noted regarding the processing of a Design Field Change:</p> <ul style="list-style-type: none"> All DRs to be formalised by means of a DFC or design revision update. All DFCs to be issued to the NNR for information (new requirement) Any DR or DFC changing the design intent shall require a design revision update and subsequent NNR approval.
Notification of the <i>Project Manager</i> of any discrepancies to any of the accepted designs, changes to Work Plan and/or Test Procedure(s).		X	<ul style="list-style-type: none"> The <i>Project Manager</i> is notified of the discrepancy prior to any corrective work being performed. 	1 working day.	
Assessment of <i>Employer</i> input required and/or acceptance of the DR.	X		<ul style="list-style-type: none"> Only an authorised <i>Employer's</i> engineering representative (Project Engineer) may accept the DR. The <i>Contractor</i> only proceeds with the change implementation once the <i>Employer</i> has accepted the DR. 	1 working day.	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Review of impact on Design and Implementation Files (Work Plans, Test Procedures etc) and implement the change (upon <i>Employer's</i> acceptance).		X	<ul style="list-style-type: none"> The <i>Contractor</i> performs a review of the change impact on Design and Implementation Files The <i>Contractor</i> maintains a log and tracks the status of each DR. 	As required	
Compilation of Design Field Change(s)		X	<ul style="list-style-type: none"> Where discrepancies have been found and notified during the installation process, the <i>Contractor</i> consolidates all DR's into at least one Design Field Change 331-313 prior to PTW suspension for testing (i.e., at installation completion). The DFC references all the DRs that it addresses as well as all configuration updates processed as part of the DR's. Where discrepancies have been found and notified during the testing/commissioning process, the <i>Contractor</i> consolidates all DR's into a design revision update which incorporates any previously approved DFC's. 	As required	Design revision updates issues following the completion of testing on the units shall be considered the unit-specific As-Built submission.
Obtaining <i>Employer</i> Line Group signatures on Design Field Change	X		<ul style="list-style-type: none"> <i>Supervisors</i> with support from the <i>Project Engineer</i>. The <i>Contractor</i> supports with any queries/clarifications. 	As a minimum the <i>Contractor</i> must allow 2 days.	For critical path work, this duration may be reduced.
<i>Employer</i> acceptance of the <i>Contractors</i> Design Revision Change / Design Field Change.	X		<ul style="list-style-type: none"> Acceptance is subject to the change being correctly documented. Where reference to the Discrepancy Report is made, the report is included as part of the change documentation. Where configuration updates are impacted, the <i>Contractor</i> submits the new update change requests, with associated tracking (DDR) numbers with the change proposal. 	Submission to <i>Project Manager</i> at modification final commissioning test + 1 week	
Identification, mark-up, and processing of configuration control changes due to DDR		X	<ul style="list-style-type: none"> The <i>Contractor</i> provides all "mark ups" drawings as part of the applicable discrepancy report / design field change. 	As required	For critical reviews, a shorter period can be negotiated with the <i>Employer</i> .
Revision of Safety Evaluations (if required).		X	<ul style="list-style-type: none"> In accordance with KAA-709. 	As required	For critical reviews, a shorter period can be negotiated with the <i>Employer</i> .
Engineering support during installation and testing.		X	<ul style="list-style-type: none"> The <i>Contractor</i> ensures that adequate technical and administrative support is available on Site to support the construction team during installation and testing stages with the change management process. 	As required	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Engineering support for problem resolution.		X	<ul style="list-style-type: none"> The <i>Contractor</i> ensures that adequate technical support is available to support the construction team with problem resolutions during installation and testing stages. 	As required	
Conclusion	X	X	<ul style="list-style-type: none"> This activity group is complete at <i>Employer</i> acceptance of the design change and/or design field change. 	In accordance with Accepted Programme	Deliverables: <ul style="list-style-type: none"> Discrepancy Reports (as required) Design Change Revision (as required) Design Field Change (as required)

5.4.26 General

Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Control Room Package make-up and submittal to Control Room.		X	<ul style="list-style-type: none"> Refer to the <i>Employer's</i> Administrative Instruction AI-025 	To - 4weeks	In liaison with the <i>Project Manager</i>
Plant status for works - verification		X	<ul style="list-style-type: none"> According to Work Plan 	As required	
Co-ordination for project Safety Risk Management authorisations.		X	<ul style="list-style-type: none"> Ensured by Responsible Person - provided by <i>Contractor</i>. 	As required	Safe Entry, Heat Stress Zones etc
Safety Risk Management authorisation	X			As required	
Plant Isolation (Pipes draining, Locking of valves etc.)	X			As required	
Issue PTW	X			As required	Boundaries specified by <i>Contractor</i> in Isolation Plan
Verification of plant isolations		X	<ul style="list-style-type: none"> Performed by Responsible Person - provided by <i>Contractor</i> - in accordance with the <i>Employer's</i> Plant Safety Regulations. 	As required	
Take out PTW		X	<ul style="list-style-type: none"> By <i>Contractor's</i> Responsible Person. 	As required	
Issue Hot Work Permit	X			As required	
Take out Hot Work Permit		X	<ul style="list-style-type: none"> By <i>Contractor's</i> Responsible Person. 	As required	
Conduct daily pre-job briefings		X	<ul style="list-style-type: none"> By <i>Contractor's</i> supervisor. <i>Employer's</i> Supervisor to observe. 	As required	
Perform pre-job surveys	X			As required	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Wall / floor opening (cables)		X	<ul style="list-style-type: none"> For walls acting as fire barriers: Holes through walls need to be filled with fireproof bags during periods when no personnel are in the area. Alternatively, a fire watch shall be required which is supplied by the <i>Contractor</i>. 	As required	Authorisation by the <i>Employer</i> .
Fire detection / Fire Watch		X	<ul style="list-style-type: none"> A fire watch shall be required for when a fire barrier is temporarily removed during the installation of a modification – the Fire Watch is provided by the <i>Contractor</i>. <i>Contractor's</i> Responsible Person to ensure that all aspects of the Hot Work Permit are respected. 	As required	
Core drilling in walls.		X	<ul style="list-style-type: none"> Requirements and civil structure verifications to be included in the design document. Core drilling to be performed in accordance with the approved Work Plan. 	As required	The <i>Employer</i> may advise in terms of location of re-enforcement, number, and location of holes.
Floor grating removal, barricading and replacement.		X	<ul style="list-style-type: none"> Scaffolding barrier to be installed around the hole because "tape barrier" is not acceptable. 	As required	
Supply of Scaffolding Material		X	<ul style="list-style-type: none"> <i>Contractor</i> to supply if not supplied by <i>Employer</i> 	In accordance with Accepted Programme	As required
Scaffold transport to site, erection, certifications and inspection, maintenance, modifications, dismantling and transport to workshop.		X	<ul style="list-style-type: none"> <i>Contractor</i> may sub-contract to approved <i>Employer</i> scaffolding <i>Contractor</i> – note requirements stated in KSM-031 (.) 	As required.	Approved <i>Employer</i> scaffolding <i>Contractor</i> .
Rigging Material		X	<ul style="list-style-type: none"> <i>Contractor</i> to supply if not supplied by <i>Employer</i> 	In accordance with Accepted Programme	As required.
Rigging material transport to site, verification, rigging labour and transport of material back to workshop.		X	<ul style="list-style-type: none"> <i>Contractor</i> may sub-contract to approved <i>Employer</i> rigging <i>Contractor</i> – note requirements stated for rigging KSA-132. 		
Operation of plant cranes		X	<ul style="list-style-type: none"> The <i>Contractor</i> provides personnel for the operation of plant cranes. Plant cranes are those considered to be part of the existing Plant 	In accordance with Accepted Programme	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Installation in accordance with Work Plan		X	<ul style="list-style-type: none"> • During installation, it is the responsibility of the <i>Contractor</i> to: <ul style="list-style-type: none"> – Comply with the requirements as stated in the Work Plan and associated referenced documentation. – Comply with the requirements prescribed in the "Permit to Work" issued in accordance with the Plant Safety Regulations. – (Where applicable) Comply with the requirements prescribed in the Radiation Protection Certificate (RPC). – Ensure that all hold and/or witness points are respected. – Adhere to the OH&S Act, the Safety Guidelines for Contractors and <i>Employer</i>, and – Continuously assess the working area and conditions in conjunction with the scope of the risk assessments performed. Where any changes occur, the risk assessment and associated sign posting is updated and required actions taken. 	As required	
Labelling of plant items		X	<ul style="list-style-type: none"> • Requirements in accordance with the <i>Employer's</i> works information. 	As required	
Welding		X	<ul style="list-style-type: none"> • The <i>Contractor</i> ensures compliance to KNM-001. 	As required	
Radiographic Testing		X	<ul style="list-style-type: none"> • All radiography performed on-site shall be performed in accordance with 238-40: Radiation Protection and Safety Requirements for Industrial Radiography • Radioactive sources are controlled in accordance with KAA-633. • The <i>Employer's</i> Radiation Protection Manager shall supply, on request, all various procedures and guides applicable to radiography to the <i>Contractor</i>. 	As required	
Notification of <i>Supervisor</i> for a required Design Field Changes.		X	<ul style="list-style-type: none"> • As stated in 331-86, a Discrepancy Report may be used to notify the required change by the <i>Contractor</i>. However, the change is documented, reviewed, and approved in accordance with the <i>Employer's</i> Design Field Change 331-313. 	As required	<i>Contractor</i> Discrepancy Report Process may be followed for changes during implementation.
Touch-up paintwork		X	<ul style="list-style-type: none"> • In compliance with KSA-106. 	As required	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Certificate of Conformance (COC)		X	<ul style="list-style-type: none"> In accordance with KAA 501. <i>Contractor</i> arranges, <i>Supervisor</i> participation. 	As required	This document is issued by an accredited electrical qualified person in accordance with the requirements of the OH&S Act and is applicable to all electrical installations of 50V and higher.
Construction Status Certificate (CSC)		X	<ul style="list-style-type: none"> The <i>Employer's</i> requirements for performing CSCs are in accordance with KAA 664. Prior to notifying the <i>Employer</i> of the CSC, the <i>Contractor</i> performs an internal CSC inspection with the applicable Subcontractor(s) and <i>Contractor's</i> quality assurance and control staff. This is to ensure that: <ul style="list-style-type: none"> the <i>works</i> are to the <i>Contractor's</i> satisfaction when notifying the CSC to the <i>Employer</i>; and limit the number of people at the time of the CSC with the <i>Employer</i>. At notification to the <i>Employer</i>, the <i>Contractor</i> submits proof of his internal CSC. and ensures that a person with sufficient knowledge of the modification attends the CSC with the <i>Employer</i>. The <i>Supervisor</i> arranges the <i>Employer</i> CSC, in liaison with the <i>Contractor</i> who participates. The <i>Contractor's</i> project manager and lead design staff are present at the CSC with the <i>Employer</i>. 	In accordance with Accepted Programme	This document certifies that the installation meets the requirements of the accepted design and that all mandatory static testing has successfully been completed. "Installation work" shall be considered complete once all newly installed / modified Plant and Materials have been safety cleared (where applicable) and CSCs signed with all safety reservations cleared.
Safety Clearance Certificate (SCC)		X	<ul style="list-style-type: none"> In accordance with KAA 501 (where required). <i>Contractor</i> arranges, <i>Supervisor</i> participate. 	In accordance with Accepted Programme	This certification is required by the operations personnel to extend the boundaries of the system from the original (unmodified) system to the newly modified system.
Issue Sanction for Test (SFT)	X		<ul style="list-style-type: none"> The <i>Employer</i> shall issue the Sanction for Test / TA upon completion of the installation <i>works</i>. 	In accordance with Accepted Programme	
Take out SFT and suspension of PTW		X	<ul style="list-style-type: none"> By <i>Contractor's</i> Responsible Person. 	As required	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Testing in accordance with test procedure(s).		X	<ul style="list-style-type: none"> • During Testing and Commissioning it is the responsibility of the <i>Contractor</i> to: <ul style="list-style-type: none"> – Comply with the approved test procedure(s) and the requirements on the "Sanction for Test" issued in accordance with the requirements of the Plant Safety Regulations. – Ensure that all hold and witness points are respected. 	As per Accepted Programme	
Control Room operations required during testing.	X			As required	<i>Employer's operators' responsibility.</i>
End of works evaluation		X	<ul style="list-style-type: none"> • The <i>Contractor</i> ensures that all work is completed, and tests are acceptable prior to PTW/SFT clearance. • The <i>Contractor</i> obtains the required test acceptance signatures as stated in KFA-006 prior to clearance of PTWs and SFTs. 	As required.	
Clearance of PTW's and SFT		X		As required	
Transfer of waste to scrap yard		X	<ul style="list-style-type: none"> • Waste is transferred to the <i>Employer's</i> designated scrap yard. 	As required	
Disposal of waste	X		<ul style="list-style-type: none"> • The <i>Employer</i> shall dispose of waste dropped in its scrap yard. 		
Writing History to SAP	X		<ul style="list-style-type: none"> • In accordance with KSM-015. • The <i>Contractor</i> ensures that the <i>Employer</i> has sufficient updated information to write history to its SAP systems. 	As required	

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Activity Description	Project Manager / Employer	Contractor	Requirements	Planning	Additional Notes
Conclusion	X	X	<ul style="list-style-type: none"> This activity group is complete upon clearance of PTW / SFT. 	In accordance with Accepted Programme	Deliverables: <ul style="list-style-type: none"> Control Room Package Work plan and QCPs – Signed off. Discrepancy Reports – Signed off. Design Field Changes – Signed off. All certification required in accordance with the PSR and in accordance with KAA-501 complete and accepted by the <i>Employer</i>. Non-destructive examination records submitted and accepted by the <i>Employer</i>. Test records submitted and accepted by the <i>Employer</i>. Non-conformances cleared and accepted by the <i>Employer</i> (unless otherwise agreed by the <i>Supervisor/Project Manager</i>). Return to Service certificates submitted and accepted by the <i>Employer</i>.

5.5 Site Work Requirements

5.5.1 General

- The *Contractor* notes that the Site is a Critical Infrastructure and complies with the associated requirements of the Critical Infrastructure Protection Act, Act number 8 of 2019.
- All staff requiring access to the site for design and installation purposes shall be subject to security requirements as well as to the Fitness for Duty (FFD) process [33].
- All Eskom procedures and standards referenced in the *Employer’s* works information, section 8 and applicable to plant and personnel on the KNPS site shall be complied with.
- The *Contractor* shall provide all labour, installation tackle, gear and tools, vehicles, rigging tackle, temporary works, consumables, equipment required to Provide the Works.

5.5.2 Spares and Special Tools

- The *Contractor* shall supply all special tools and equipment required to perform the prescribed verification, testing and calibration of the proposed KIS System.

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- The *Contractor* shall be responsible for any works that can reasonably be inferred from the *Employer's* works information.

5.5.3 Rigging Requirements

- The *Contractor* shall be responsible for all rigging and lifting requirements to implement the works as required in the *Employer's* works information.
- All rigging and lifting operations of suspended loads shall be in accordance with and comply with requirements listed in the *Employer* Lifting and Rigging Programme KSA-132 [109].
- The *Contractor* shall submit comprehensive Lift Plans in accordance with KSA-132 [109] for each lift. The dimensions and masses of components / assemblies to be rigged shall be clearly indicated. The Lift Plans shall be compiled and documented in a Rigging File. The rigging personnel qualifications and certification and the rigging and lifting equipment inspection certificates shall be included in the Rigging File.
- The Rigging File shall be submitted to the *Employer* for review and approval before any rigging and lifting activities commence.

5.5.4 Inspection and Testing Requirements

Refer to the *Employer's* works information, section.3.3.5

5.5.5 Welding Requirements

- The *Contractor* responsible for the welding shall be ISO 3834-2 certified.

5.5.6 Lagging Requirements

Not Applicable

5.6 Completion, testing, commissioning, and correction of Defects

5.6.1 Work to be done by the Completion Date

On or before the Completion Date the *Contractor* shall have done everything required to Provide the Works except for the work listed below which may be done after the Completion Date but in any case before the dates stated. The *Project Manager* cannot certify Completion until all the work except that listed below has been done and is also free of Defects which would have, in his opinion, prevented the *Employer* from using the *works* and Others from doing their work.

	Item of work	To be completed by
	Not Applicable	

5.6.2 Use of the works before Completion has been certified.

The *Employer* and Others may use the *works* for the performance of acceptance tests and commissioning as well as production.

5.6.3 Equipment used for tests and inspections.

The *Contractor* provides the *Project Manager* with copies of valid calibration certificated for all Equipment intended for use during testing and inspections.

5.6.4 Materials facilities and samples for tests and inspections

Refer to the *Employer's* works information, section 3.3.5

5.6.5 Tests before Completion

Refer to the *Employer's* works information, section 3.3.5

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5.6.6 Commissioning

Refer to the *Employer's* works information, section 3.3.7

5.6.7 Start-up procedures required to put the works into operation.

As part of the detailed design, the *Contractor* shall provide to the *Employer* for acceptance a post-installation testing and commissioning plan in accordance with KFA-006 [91] and KAA-648 [66].

5.6.8 Take over procedures.

The *Employer* shall use the *works* during start-up of each unit up to and including the point where any related testing and commissioning that requires the plant to be in operation have been successfully completed.

The *Employer* shall not take over the *works* until all related testing and commissioning have been completed, all as-built documentation updated by the *Contractor*, all implementation records completed by the *Contractor*, accepted by the *Project Manager*, and all related configuration updates completed by the *Contractor*.

5.6.9 Access given by the Employer for correction of Defects.

Upon the *Supervisor's* notification of Defect following unit start-up, the *Supervisor* shall identify the period wherein access shall be given to the *Contractor* for access to correct Defects. Ordinarily, access shall only be given during a planned shutdown of the applicable Koeberg Operating Unit.

5.6.10 Performance tests before Completion

Refer to the *Employer's* works information, section 3.3.5

5.6.11 Performance tests after Completion

Refer to the *Employer's* works information, section 3.3.5

As part of the detailed design, the *Contractor* shall provide to the *Employer* for acceptance a post-installation testing and commissioning plan in accordance with KFA-006 [91] and KAA-648 [66].

5.6.12 Operational maintenance after Completion

Operational maintenance shall be performed by the *Employer* in accordance with the maintenance requirements specified by the *Contractor*.

- The *Contractor* shall provide Maintenance Manuals as listed in the *Employer's* works information section 2.3.5 (Operating and Maintenance Manual Requirements) shall be updated (marked up) to reflect changes made by this modification. Such mark ups shall be supplied with the detailed design.
- The maintenance manual provided by *Contractor* shall include a spares list and maintenance programs.

5.6.13 Shipment requirements

INCOTERM DDP applies to this contract:

- No shipment of Equipment shall take place without an associated factory release authorised by the *Supervisor* or its appointed representative.
- The *Contractor* shall ensure that the manufacturer's recommendations regarding shipping and packaging are adhered to.

Specific technical requirement relating to shipping shall be developed and specified in the *Contractor's* design.

The *Contractor* arranges all shipments of Plant and Materials and Equipment to the Site and consigns all such shipments to himself as consignee at the project shipping address, freight fully prepaid. The *Contractor* makes demurrage agreements and settlements with carriers for his shipments.

6 Plant and Materials standards and workmanship

Poor quality of workmanship shall not be tolerated by the *Employer*. *Contractor* staff, including subcontractor staff performing construction work on Site shall be subject to skills assessment tests in accordance with the requirements stated in KSA-119.

6.1 Investigation, survey, and Site clearance

The *Contractor* is allowed access, by the *Employer*, to the Site to further inspect the Working Area on Site. Any *works* that may be required to survey the plant area, shall be subjected to standard planning and scheduling requirements of plant work i.e., work plan with associated risk assessment and planning and scheduling in accordance with KAA-721 Rev 6.

6.2 Building works

Not applicable to this scope of work.

6.3 Civil engineering and structural works

Not applicable to this scope of work

6.4 Electrical & mechanical engineering works

The necessary Electrical works required by *Contractor* are detailed in the *Employer's* works information.

6.5 Process control and IT works

Not applicable to this scope of work.

7 List of drawings

7.1 Drawings issued by the *Employer*.

This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this contract.

Note: Some drawings may contain both Works Information and Site Information.

Drawing number	Revision	Title
KBA 0117 KIS 001	Z10	KIS Seismic Instrumentation System Manual
KBA 0117 KIS 700	Z2	1 KIS Seismic Instrumentation Wiring Diagrams
KBA 0116 G05 251	Z6	Seismic Instrumentation Measure Connecting Diagram
KBA 0116 G05 254	Z9	Seismic Sensors Location and Mounting
KBA 0117 KIS 325	1	Equipment and Cabling Diagram – Relaying and Junction Boxes
KBA 0116 J06 618	1	Seismic Instrumentation Relay Rack Wiring

8 References

- [1] 0406-87Q (C): Classification KIS System Instrumentation
- [2] 238-102: Quality and Safety Management Requirements for Nuclear Suppliers Level 2
- [3] 240-110745414: Standard for the In-Service Inspection Programme at Koeberg Nuclear Power Station
- [4] 240-121010217: Design Extension Related Guidance for Modifications and Equipment – Seismic
- [5] 240-127002040: Procurement Quality Engineering Requirements (KSA-089)
- [6] 240-142639998: Safety Evaluation Process Guide (KGA-025)
- [7] 240-143604773: Safety Evaluation Process
- [8] 240-55410927: Cyber Security Standard for Operational Technology
- [9] 240-62989893 Rev 2 - DRIVER'S VEHICLE ACCIDENT REPORTING FORM
- [10] 240-77046688 Rev 2 - Occupational Health and Safety Investigation Report Template
- [11] 240-79669677: Demilitarized Zone (DMZ) Designs for Operational Technology
- [12] 240-83539994: Standard for Non-Destructive Testing (NDT) on the *Employer's* Plant
- [13] 240-86973501: Engineering Drawing Standard
- [14] 240-89294359: Nuclear Safety, Seismic, Environmental, Quality, Importance and Management System Level Classification Standard
- [15] 32-6: Document and Records Management Procedure
- [16] 32-421 Rev 0 – Eskom cardinal rules
- [17] 32-95 Rev 6 - Procedure Manual for Perform Occupational Health and Safety management and Environmental Management: Conduct EH&S Incident Management
- [18] 32-136 Rev 2 – Construction Safety, Health, and Environment Procedure
- [19] 331-83: Standard for Plant Changes Affecting the Design of Koeberg Nuclear Power Station
- [20] 331-85: Design Documentation Change Process
- [21] 331-86: Design Changes to Plant, Plant Structures or Operating Parameters
- [22] 331-87: Design Engineering Guide

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- [23] 331-91: Control of Equipment and Software Classifications
- [24] 331-93 Rev 0 - Guide for Classification of Plant Components, Structures and Parts
- [25] 331-94: Importance Category Classification Listing (KLA-001)
- [26] 331-170 Rev 0 – Requirements for Protective Coatings for use at Koeberg Nuclear Power Station (KSA-106)
- [27] 331-186: Environmental Qualification at Koeberg Operating Unit
- [28] 331-313 Design Field Changes
- [29] 331-398: Software Listing (KLA-022)
- [30] 331-399: Software Classification
- [31] 331-433: Detailed Design Review report (KFU-026)
- [32] 331-645: Elastomeric Aseismic Bearings – Current Position and the Way Forward
- [33] 335-68 Rev 2 – Fitness for Duty Process for Contractors who are required to Perform Work Inside the Owner Controlled Area of Koeberg Nuclear Power Station
- [34] AI-025 Rev 1 – Modification Work - Control Room Packages
- [35] ANSI 2.2: Earthquake Instrumentation Criteria for Nuclear Power Stations
- [36] ASME B31.1 – Boiler & Pressure Vessel Code [Commercial Document – not supplied]
- [37] ASME III 2001 – Boiler & Pressure Vessel Code [Commercial Document – not supplied]
- [38] ASME VIII – Boiler & Pressure Vessel Code [Commercial Document – not supplied]
- [39] ASME NQA-1: Quality Assurance Requirements for Nuclear Facility Applications
- [40] Basic Conditions of Employment Act No. 75 of 1997 [Public Document – not supplied]
- [41] CN-2234: SAR Editorial Change Request for MOD 07072
- [42] DSG-317-094 Rev 4 – Specifications for Chemical Products & Materials Used at KNPS
- [43] DSG-318-033: Specification for Seismic Qualification of Electrical and Mechanical Equipment
- [44] DSG-318-087 Rev 2: Quality Requirements for the Procurement of Assets, Goods and Services
- [45] DVC DSE: Main Electrical Building, Control Room Air Conditioning System, Chapter II, System Function
- [46] DVG DSE: System Manual Charging Pumps Room Emergency Ventilation System, Chapter III
- [47] DVH DSE: System Manual CRDM Power Supply Room and ASG Pump Ventilation System, Chapter III
- [48] DVM DSE: Operation of the System DVM, Turbine Hall Ventilation
- [49] DWS DSE: System Manual Essential Service Water Pumping Station Ventilation System, Chapter III
- [50] *Employer's internal Design Template Revision 30*
- [51] ESKASAAU7: Quality Requirements for the Procurement of Assets, Goods and Services
- [52] EVR DSE: System Manual Containment Continuous Ventilation System, Chapter III
- [53] GGG-1299 Rev 0 – Guide for Technical Writing
- [54] IEEE 1012: Standard for System and Software Verification and Validation
- [55] IEEE 344: Seismic Qualification of Equipment for Nuclear Power Generating Stations
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- [62] KAA-611: Emergency Mustering, Accountability and Evacuation
- [63] KAA-614: Control of Spares Assessments and New Stock Applications
- [64] KAA-633: Control of Radioactive Sources and X-Ray Equipment
- [65] KAA-641: 6 Control of receipt of materials.
- [66] KAA-648: Administration and Responsibilities for Requalification Testing
- [67] KAA-664: Issuing a Construction Status Certificate / Safety Clearance Certificate
- [68] KAA-667: Processing a Permit to Work
- [69] KAA-688: The Corrective Action Process
- [70] KAA-691: Response to Seismic Events
- [71] KAA-709: Process for Performing Safety Screenings, Safety Evaluations, Safety Justifications and Safety Cases
- [72] KAA-721: Online work Management Process
- [73] KAA-733: Monitoring of receipt inspection processes.
- [74] KAA-751: The Control of Chemical Products at Koeberg Nuclear Power Station
- [75] KAA-768: Safety, Health and Environment and Programme
- [76] KAA-777: Process for Access to Koeberg Nuclear Station
- [77] KAA-780: Systematic Approach to Training – Analysis
- [78] KAA-913: Integrated Equipment Reliability Process
- [79] KBA 0000 G00 1000: Koeberg Drawing Standard
- [80] KBA 0015 M00 0007: Technical Specifications Earthing Circuits
- [81] KBA 0015 K08 003: Technical Specification Grouping Cabinets and Local Control Cabinets
- [82] KBA 0022 N NEPO LOPP 012: KIS Plant Engineering Life of Plant Plan
- [83] KBA 1222 F00 001: Equipment Marking
- [84] KBA-0022-SRSM-000-00: Safety Related Surveillance Manual
- [85] KBA 0117 KIS 700: 1 KIS Seismic Instrumentation Wiring Diagrams
- [86] KBA 0901 G00 256: Nuclear Island Room Identification
- [87] KBA 1215 K00 007: Technical Specification for Cable Installation
- [88] KBA 1216 H01 251: Standards Drawings for Sensor Installation
- [89] KAE-012: Hazardous and non-Hazardous waste and scrap disposal
- [90] KFA-002: Work Plan Template
- [91] KFA-006: Testing Procedure Template
- [92] KFA-035: Design Change Package Implementation Approval
- [93] KFU-038: ER Change Request
- [94] KFU-026: Detailed Design Review Report
- [95] KFU-PE-008: Plant Hand-over Certificate
- [96] KFU-SR-004 Rev 7
- [97] KGA-020: Initiating a Maintenance Work Request
- [98] KIS DSE: KIS System Design Manual
- [99] KLA-023: Outage Preparation Milestone Checklist
- [100] KNM-001: KNPS Welding Programme
- [101] KSA-011: The Requirements for Controlled Documents
- [102] KSA-020: Software Quality Assurance

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- [103] KSA-062: Reactor Building Access Requirements
- [104] KSA-069: Foreign Material Exclusion
- [105] KSA-101: Software Requirement Specifications
- [106] KSA-106: Requirements for Protective Coatings for use at Koeberg Nuclear Power Station
- [107] KSA-109: Requirements for Access Authorisation at KOU
- [108] KSA-119: Management and Control of Supplemental Workers Koeberg Nuclear Power Station
- [109] KSA-132: Lifting and Rigging Requirements
- [110] KSA-913: Integrated Equipment Reliability Standard: Preventive Maintenance Basis
- [111] KSM-015: Maintenance History Records
- [112] KSM-031: Scaffolding Program
- [113] KSU-006: Maintenance Basis Determination, Documentation and Change Control
- [114] KTA-001: Training and Qualification requirements for Nuclear Safety Review Committees
- [115] KWM-MW-WEL-005 - Storage, Handling, Control and Preservation of Stainless Steel
- [116] National Environmental Management Act 107 of 1998 [Public Document - not supplied]
- [117] National Key Points Act 102 of 1980 [Public Document – not supplied]
- [118] MM 603: KIS Maintenance Manual
- [119] NRC RG 1.12: Regulatory Guide: Nuclear Power Plant Instrumentation for Earthquakes
- [120] NRC RG 5.71: Regulatory Guide: Cyber Security Programs for Nuclear Facilities
- [121] NSIP03959: Eskom (2022) Duynefontein Site Safety Report Rev 1
- [122] Nuclear Energy Act 92 of 1982 [Public Document – not supplied]
- [123] NUREG 0700: Human-System Interface Design Review Guidelines
- [124] Occupational Health and Safety Act (OH&SA#85 of 1993) [Public Document – not supplied]
- [125] OHSAS 18001:2007 - Occupational health and safety management standard [Public Document – not supplied]
- [126] OTS Rev 7 – Operating Technical Specification for Koeberg Nuclear Power Station
- [127] PP-0012 Manufacturing of Components for Nuclear Installations Rev 0
- [128] Project and Construction Management Act, 48 of 2000 [Public Document – not supplied]
- [129] Protection of Information Act 84 of 1982 [Public Document – not supplied]
- [130] QFR-026: Maintenance Strategy Input Sheet
- [131] RD-0034: Quality and Safety Management Requirements for Nuclear Installations
- [132] RG-0014: Guidance on Implementation of Cyber or Computer Security for Nuclear
- [133] Revenue Laws Amendment Act 45 of 2003 [Public Document – not supplied]
- [134] SANS 10091: National Colour Standard
- [135] SANS 10111: Engineering Drawing Principles
- [136] SANS 10142-1: The Wiring of Premises Part 1: Low-voltage Installations
- [137] SANS 60950: Information Technology Equipment – Safety
- [138] SAR Part II-1.8.3: Koeberg Safety Analysis Report - Seismic Instrumentation
- [139] Value Added Tax Act, no 89 of 1991 [Public Document – not supplied]

9 Appendices

- 9.1. TRS 240-163236795 rev 4 Technical Requirement Specification

C3.2 Contractor's Works Information

This section of the Works Information shall always be contract specific depending on the nature of the *works*.

It is most likely to be required for design and construct contracts where the tendering contractor shall have proposed specifications and schedules for items of Plant and Materials and workmanship, which once accepted by the *Employer* prior to award of contract now become obligations of the *Contractor* per core clause 20.1.

Typical subheadings could be:

- a) *Contractor's* design
- b) Plant and Materials specifications and schedules
- c) Other

This section could also be compiled as a separate file.

Part 4: Site Information

Document reference	Title	No of pages
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C4	Site Information	1
	Total number of pages	2

Part 4: Site Information

1. General description

1.1. Location of the Site

The site is located on the Duynefontein Farm within boundaries of the Bulk Stores Site at Koeberg Operating Unit (KOEBERG) north of Melkbosstrand in the South Western Cape and is reached via the main road from Cape Town to Saldanha (R27). The turn off to KOEBERG is indicated on the R27. KOEBERG is approximately 30 km north of Cape Town and the approximate co-ordinates are 33°40. 7'S and 18° 26.1'E.

After the turn off, the access route follows the main road to KOEBERG.

The Construction site is denoted on the *Employer's* works information.

The topography of Duynefontein Farm is relatively flat with a gentle slope toward the coast. Both ancient dunes stabilised by vegetation and recent unconsolidated dunes with heights of up to 10 m are found along the coastline.

Theron et al. (1992) describes the geology of the site as calcareous to acid Quaternary sands. The sites can be described in general terms as being located on a Tertiary to Recent flat sandy plain of neutral to acid sands of marine, estuarine and aeolian origins (Arcus Gibb 2007). The area is underlain by Malmesbury Group sediments which are of marine sedimentary origin, which contributes higher salinities to the wetlands adjacent to the Environmental Survey Laboratory (Day 2008)

1.2. Security check points

Prior to access to Site, there are two PEB security check points, viz, at the entrance from the R27 and at the entrance from Duynefontein. Security access is through the Bulk Stores security office.

Personnel entering the site are to be in possession of their Identity Document (ID) for verification. New personnel are to report to the ACP1 Office for administration and record update.

No cameras, firearms, and sharp objects shall be allowed to enter site.

2. Existing buildings, structures, and plant & machinery on the Site

Not applicable to this scope of work.

3. Subsoil information

Not applicable to this scope of work.

4. Hidden services

Not applicable to this scope of work.

5. Other reports and publicly available information

Not applicable to this scope of work.