ESKOM

KOEBERG NUCLEAR POWER STATION

SPECIFICATION ENGINEERING

Specification Title

PLANT CHEMICALS

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DATE:	2016-05-29	
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KOEBERG NUCLEAR POWER STATION

NUCLEAR ENGINEERING

	APPROVED: JHE DANIELS	DATE: 2000-04-06
PARAGRAPHS	**PREPARED BY**	**REVIEWED BY**
Original	JR MELLOR	NG ROWE

RECORD OF REVISIONS

Rev	Date	Description of Revision	Prep.	Rev.	Appr.
0	2000-04-06	Original	JRM	NGR	JHED
0a	2002-11-06	Remove (as per Section 6.0) out of Documentation.	JRM	NGR	JHED
1	2016-03-16	Full review – addition of other plant chemicals.	XB	AS / SRW	NR

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PROCUREMENT SPECIFICATION

PRODUCT: PLANT CHEMICALS

TECHNICAL DESCRIPTION: PLANT CHEMICALS: PHYSICAL CHARACTERISTICS OF THE CHEMICALS TO CONFORM TO PARAMETERS AS CONTAINED IN THE MATERIAL SAFETY DATA SHEETS (MSDS). IMPURITY CONTENTS OF THE RELEVANT CHEMICALS TO CONFORM TO DATA PROVIDED IN APPENDIX 1.

MARKING AND IDENTIFICATION:

Each chemical container shall be clearly labelled with the following information:

- General description of package content;
- Concentration of contents;
- Manufacturer's name and product batch/lot number;
- Pictogram -triangular - (black border with yellow centre) depicting health hazard of contents;
- ESKOM's SAP number (if applicable); and
- ESKOM's order number.

Marking notices and signs shall be in accordance with OHSA, Act 85 of 1993, requirements.

Marking notices and signs shall be weatherproof.

QUALITY ASSURANCE:

All conditions and requirements contained in this specification shall comply with the Eskom Quality Assurance standard provided with the tender enquiry or purchase order.

The safety classification of the chemical provided in accordance with this specification is:

- 0029/99Q (NSF/NC/Q3/NEV)

The Quality Assurance Data Package (QADP) shall consist of a guaranteed vendor's chemical analysis demonstrating compliance with this specification. This analysis shall identify the batch or lot number of the chemical.

DOCUMENTATION:

The supplier/vendor shall provide the following documentation with each chemical delivery:

- Certificate of Analysis
- Certificate of Compliance
  - The Certificate of Compliance shall state that the chemical supplied meets the requirements of this specification.
  - Eskom authorised personnel shall review the Certificate of Compliance prior to release and use of the chemical. All documentation must be completely legible.

In addition, at the time of, or prior to, the first delivery to Eskom, the supplier/vendor shall furnish the following documentation:

- Storage instructions to ensure chemical shelf life;
- Technical literature on chemical handling (if available) which should be in the form of a Material Safety Data Sheet (MSDS).

The supplier shall undertake to provide updates of the above as and when they become available.

Full details of all deviations from this Specification must be submitted to ESKOM (KOEBERG) in writing for clearance prior to manufacture/despatch of the product.

PACKAGING AND SHIPMENT:

The chemical materials shall be supplied in sealed containers to prevent loss, contamination or deterioration of contents during transport, handling and storage.

The sealed containers shall be of a robust nature to facilitate the prevention of personnel contact during transport, handling and storage.

APPENDIX 1

ALUMINIUM SULPHATE

Appearance : Amber kibbles, granules or powder

Note: Specification meets SABS 1241 requirements – grade 1

Chemical parameters	**Limit**
Aluminium (as Al_2O_3)	> 15%
Iron (as Fe_2O_3)	< 0.014%
Insoluble matter	< 0.05%
pH of 0.1M solution	> 3.0
Size	0.5 – 5 mm

CITRIC ACID

Chemical parameters	**Limit**
Assay	> 99.5%
Arsenic	< 1 ppm
Chloride	< 30 ppm
Heavy Metals	< 5 ppm
Iron	< 5 ppm
Oxalate	< 200 ppm
Sulphate	< 100 ppm
Sulphated ash	< 0.05%
Water	7.5 – 8.8%

EDTA

Note: must be di-sodium salt of EDTA

Chemical parameters	Limit
Bulk density	520 – 760 g/l
Concentration (calculated as EDTA)	85 – 88%
Chloride	< 60 ppm
Heavy metals	< 10 ppm
Iron	< 10 ppm
pH (1% in water)	10.5 – 12.5

HYDROCHLORIC ACID

Appearance : Colourless to light yellow

Chemical parameters	Limit
Assay	> 30% (m/m)
Specific gravity	> 1.15
Dissolved chlorine (as Cl)	< 5 ppm
Fluoride	< 5 ppm
Iron	< 15 ppm
Total organics	< 5 ppm

HYDROGEN PEROXIDE

Chemical parameters	Limit (ppm)
Acidity (as H_2SO_4)	< 300
Arsenic	< 1
Chloride	< 1
Copper	< 1
Dry Residue	< 60
Iron	< 0.5
Lead	< 1
Phosphate	< 50
Sulphate	< 5
Tin	< 10

POTASSIUM HYDROXIDE (KOH)

Note: Impurities refer to dry KOH (100%)

Chemical parameters	Limit
Assay	> 30%
Carbonates (as K_2CO_3)	< 0.5%
Chloride (as KCl)	< 150 ppm
Iron	< 20 ppm
Silica	< 75 ppm
Sulphate (as K_2SO_4)	< 20 ppm
TOC	< 20 ppm

SODIUM HYDROXIDE (48%)

Appearance : Clear, syrupy liquid

Chemical parameters	**Limit**
Assay	> 47%
Specific gravity (at 20°C)	> 1.5
Carbonate	< 2000 ppm
Chloride (as NaCl)	< 300 ppm
Iron	< 10 ppm
Mercury	< 2 ppb
Sulphate	< 100 ppm

SODIUM HYDROXIDE PELLETS

Chemical parameters	**Limit**
Assay	> 98.5%
H_2CO_3	< 0.45%
Iron	< 40 ppm
Sodium chloride	< 0.02%

SODIUM HYPOCHLORITE (NaOCl)

Appearance : Clear greenish yellow liquid, free of sediment and suspended matter

Chemical parameters	**Limit**
Available chlorine	11.9 - 14.8%
Cobalt	< 0.1 ppm
Copper	< 0.1 ppm
Excess free NaOH	0.1 - 1.1%
Iron	< 1 ppm
NaOCl	12.5 - 15.6%
Nickel	< 0.1 ppm
pH	11.86 - 13.0