

|  |                                                                                                | MEDIUM VOLTAGE INDUCTION MOTORS TECHNICAL SCHEDULE A&B TEMPLATE (Rev. 0) |                   |                |                   |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------|----------------|-------------------|
| Project Name:                                                                    |                                                                                                |                                                                          |                   |                |                   |
| Project No:                                                                      |                                                                                                | MWP                                                                      |                   |                |                   |
| PLANT DESCRIPTION (e.g. Boiler, Turbine, Coal Overland, etc.)                    |                                                                                                | Ash Extendible Conveyor                                                  |                   |                |                   |
| APPLICATION (e.g. Centrifugal Fan, Screw Pump, Mill, Conveyor, etc.)             |                                                                                                | Conveyor                                                                 |                   |                |                   |
| ITEM                                                                             | DESCRIPTION                                                                                    | UNITS                                                                    | ESKOM or SUPPLIER | ESKOM Comments | SUPPLIER Comments |
| 1.0                                                                              | Driven Load Requirements                                                                       |                                                                          |                   |                |                   |
| 1.01                                                                             | Driven machine manufacturer (OEM)                                                              | Name                                                                     |                   |                |                   |
| 1.02                                                                             | Manufacturer reference code/serial number                                                      | Code                                                                     |                   |                |                   |
| 1.03                                                                             | Number of units installed or to be installed                                                   | Number                                                                   |                   |                |                   |
| 1.04                                                                             | Power and Torque vs Speed Characteristic                                                       | Description                                                              |                   |                |                   |
| 1.05                                                                             | Power required at duty point (referred to motor shaft)                                         | kW                                                                       |                   |                |                   |
| 1.06                                                                             | Speed at duty point (referred to motor shaft)                                                  | RPM                                                                      |                   |                |                   |
| 1.07                                                                             | Speed range<br>(Variable Speed application)                                                    | 1.071) Minimum speed<br>1.072) Maximum speed                             | RPM<br>RPM        |                |                   |
| 1.08                                                                             | Efficiency of the driven equipment at duty point                                               | %                                                                        |                   |                |                   |
| 1.09                                                                             | Load moment of inertia at motor shaft                                                          | kg.m <sup>2</sup>                                                        |                   |                |                   |
| 1.10                                                                             | Required starting torque                                                                       | Nm                                                                       |                   |                |                   |
| 1.11                                                                             | Rated load torque                                                                              | Nm                                                                       |                   |                |                   |
| 1.12                                                                             | Maximum permissible start-up time                                                              | s                                                                        |                   |                |                   |
| 1.13                                                                             | Maximum permissible deceleration time                                                          | s                                                                        |                   |                |                   |
| 1.14                                                                             | Maximum permissible torque margin (Peak Torque)                                                | Nm                                                                       |                   |                |                   |
| 1.15                                                                             | Maximum axial movement of half coupling towards motor                                          | mm                                                                       |                   |                |                   |
| 1.16                                                                             | Maximum axial half coupling towards away from motor                                            | mm                                                                       |                   |                |                   |
| 1.17                                                                             | Maximum Axial Thrust Towards Motor                                                             | N                                                                        |                   |                |                   |
| 1.18                                                                             | Maximum Axial Thrust Away From the Motor                                                       | N                                                                        |                   |                |                   |
| 1.19                                                                             | Shaft Rotation (viewed on motor drive end shaft) Clockwise or Anticlockwise                    | Name                                                                     |                   |                |                   |
| 1.20                                                                             | Bearing type (Antifriction or sleeve bearing)                                                  | Ball/Roller/Sleeve                                                       |                   |                |                   |
| 1.21                                                                             | Lubrication type (Grease or oil)                                                               | Name                                                                     |                   |                |                   |
| 1.22                                                                             | Area classification                                                                            | Hazardous or Non-Hazardous                                               | Hazard/Non-Hazard |                |                   |
| 1.23                                                                             | Application environmental conditions                                                           | 1.2301) Indoor or Outdoor<br>1.2302) Clean or Dusty                      | Indoor<br>Dusty   |                |                   |
| 1.24                                                                             | Starting method (Direct-on-line starting, Soft starting or Soft starting with speed variation) | DOL/Softstater/VSD                                                       | DOL               |                |                   |
| 1.25                                                                             | Method of stopping (Coast to stop, Mechanical braking or Electrical braking)                   | Name                                                                     |                   |                |                   |
| 1.26                                                                             | Drive coupling method (e.g. direct, gearbox)                                                   | Name                                                                     |                   |                |                   |
| 1.27                                                                             | Coupling type (e.g. belt, chain)                                                               | Name                                                                     |                   |                |                   |
| Required Drawings & Curves                                                       |                                                                                                |                                                                          |                   |                |                   |
| 1.28                                                                             | Load Torque-Speed curve(s) reference number                                                    | Number                                                                   |                   |                |                   |
| 1.29                                                                             | Load performance curve reference number                                                        | Number                                                                   |                   |                |                   |
| 1.30                                                                             | Coupling drawing reference number                                                              | Number                                                                   |                   |                |                   |
| 1.31                                                                             | Motor and Load Layout drawing reference number                                                 | Number                                                                   |                   |                |                   |

| 2.0   | Power Supply                                                                                 | UNITS        | ESKOM            | SUPPLIER   | ESKOM Comments            | SUPPLIER Comments |
|-------|----------------------------------------------------------------------------------------------|--------------|------------------|------------|---------------------------|-------------------|
| 2.1   | Normal Supply                                                                                |              | Schedule A       | Schedule B | Eskom Spec - 240-57617975 |                   |
| 2.101 | Supply Voltage, 3-phase, $\pm 5\%$ (e.g. 3.3kV, 6.6kV, 11kV and 15kV)                        | kV           | 3.3kv $\pm 5\%$  |            |                           |                   |
| 2.102 | Supply frequency, 50Hz $\pm 2\%$                                                             | Hz           | 50 $\pm 2\%$     |            |                           |                   |
| 2.103 | Voltage unbalance: Negative sequence voltage up to 2 % of positive sequence voltage (Vp).    | %            | 2%               |            |                           |                   |
| 2.104 | Voltage harmonic distortion                                                                  | %            | $\leq 5\%$       |            |                           |                   |
| 2.2   | Abnormal power supply (prevailing simultaneously for up to 6 hours)                          |              |                  |            |                           |                   |
| 2.201 | Supply Voltage, 3-phase, $\pm 10\%$ (e.g. 3.3kV, 6.6kV, 11kV and 15kV)                       | V            | 3.3kv $\pm 10\%$ |            |                           |                   |
| 2.202 | Supply frequency, 50 Hz $\pm 2\%$ for 80 minutes                                             | Hz           | 50 $\pm 2\%$     |            |                           |                   |
| 2.203 | Voltage unbalance: Negative sequence voltage up to 3 % of nominal positive sequence voltage. | %            | 3%               |            |                           |                   |
| 2.204 | V/F ratio $< 1.1$ pu                                                                         | pu           | $\leq 1.1$       |            |                           |                   |
| 2.3   | Transient - voltage within 10% of nominal within 3 seconds after the transient:              |              |                  |            |                           |                   |
| 2.301 | Complete loss of supply for 0.2 seconds                                                      | s            | 0.2              |            |                           |                   |
| 2.302 | Voltage depression up to 85% of nominal for up to 60 second                                  | %            | 85% for 1minutes |            |                           |                   |
| 2.303 | Voltage depression up to 75% of nominal for up to 1 second                                   | %            | 75% , 1seconds   |            |                           |                   |
| 3.0   | Operating Conditions                                                                         | UNITS        | ESKOM            | SUPPLIER   | ESKOM Comments            | SUPPLIER Comments |
| 3.01  | Altitude above sea level (e.g. 1000, 1600)                                                   | m            | 1626             |            |                           |                   |
| 3.02  | Normal daily maximum temperature                                                             | °C           | 26               |            |                           |                   |
| 3.03  | Normal daily minimum temperature                                                             | °C           | 4                |            |                           |                   |
| 3.04  | Extreme maximum temperature                                                                  | °C           | 40               |            |                           |                   |
| 3.05  | Extreme minimum temperature                                                                  | °C           | 0                |            |                           |                   |
| 3.06  | Ambient Air Quality                                                                          | Describe     |                  |            |                           |                   |
| 3.07  | Average humidity                                                                             | %            |                  |            |                           |                   |
| 3.08  | Extent of Base Vibrations                                                                    | Low/Med/High | Med              |            |                           |                   |
| 4.0   | Motor General Information                                                                    |              |                  |            |                           |                   |
| 4.01  | Applicable SANS standard                                                                     | Code         | SANS 60034       |            |                           |                   |
| 4.02  | Applicable Eskom Standard                                                                    | Number       | 240-50237155     |            |                           |                   |
| 4.03  | Motor manufacturer (of existing motor where applicable - not the requirement)                | Name         | GEC              |            |                           |                   |
| 4.04  | Motor manufacturer reference code/serial number (of existing motor where applicable)         | Code         | Provide          |            |                           |                   |
| 4.05  | Fabrication factory                                                                          | Name         | Provide          |            |                           |                   |
| 4.06  | Motor life expectancy                                                                        | Yrs          | >20              |            |                           |                   |
| 5.0   | Motor Electrical Details                                                                     |              |                  |            |                           |                   |
| 5.10  | Motor Rating                                                                                 |              |                  |            |                           |                   |
| 5.101 | Rated output power                                                                           | kW           | 315              |            |                           |                   |
| 5.102 | Supply voltage (e.g. 3.3kV, 6.6kV, 11kV and 15kV)                                            | V            | 3,300            |            |                           |                   |
| 5.103 | Frequency (e.g. 50 or 60)                                                                    | Hz           | 50               |            |                           |                   |
| 5.104 | Full load current                                                                            | A            | 62               |            |                           |                   |
| 5.105 | Rated Speed                                                                                  | RPM          | 1481             |            |                           |                   |
| 5.106 | Winding connection                                                                           | Star/Delta   | Star             |            |                           |                   |
| 5.107 | Duty-class as per IEC 60034-1 (e.g. S1, S2, S3, etc.)                                        | Code         | S1               |            |                           |                   |
| 5.108 | Utilization factor (Load power at duty point/motor rated power), $\geq 75\%$ , $\leq 90\%$   | %            |                  |            |                           |                   |
| 5.20  | Motor Performance Guarantees                                                                 |              |                  |            |                           |                   |
| 5.201 | Full load torque                                                                             | Nm           | 2031             |            |                           |                   |
| 5.202 | Locked rotor torque                                                                          | Nm           | 2031             |            |                           |                   |
| 5.203 | Pull up torque                                                                               | Nm           | 2031             |            |                           |                   |
| 5.204 | Breakdown torque                                                                             | Nm           | 4469             |            |                           |                   |
| 5.205 | Locked rotor current                                                                         | A            | 370              |            |                           |                   |
| 5.206 | Efficiency at 100% Loading                                                                   | %            | 95.0%            |            |                           |                   |
| 5.207 | Efficiency at 75% Loading                                                                    | %            | 94.5%            |            |                           |                   |
| 5.208 | Efficiency at 50% Loading                                                                    | %            | 93.0%            |            |                           |                   |
| 5.209 | Power factor at 100% Loading                                                                 | %            | 85%              |            |                           |                   |
| 5.210 | Power factor at 75% Loading                                                                  | %            | 83%              |            |                           |                   |
| 5.211 | Power factor at 50% Loading                                                                  | %            | 80%              |            |                           |                   |
| 5.30  | Motor parameters                                                                             |              |                  |            |                           |                   |
| 5.301 | X/R Ratio                                                                                    | %            | Provide          |            |                           |                   |
| 5.302 | Stator Resistance @ Standstill (slip = 1)                                                    | $\Omega$     | Provide          |            |                           |                   |
| 5.303 | Stator Reactance @ Standstill (slip = 1)                                                     | $\Omega$     | Provide          |            |                           |                   |
| 5.304 | Rotor Resistance @ Standstill (slip = 1)                                                     | $\Omega$     | Provide          |            |                           |                   |
| 5.305 | Rotor Reactance @ Standstill (slip = 1)                                                      | $\Omega$     | Provide          |            |                           |                   |

|             |                                                                         |                    |         |  |  |  |
|-------------|-------------------------------------------------------------------------|--------------------|---------|--|--|--|
| 5.306       | Stator Resistance @ Full Load                                           | $\Omega$           | Provide |  |  |  |
| 5.307       | Stator Reactance @ Full Load                                            | $\Omega$           | Provide |  |  |  |
| 5.308       | Rotor Resistance @ Full Load                                            | $\Omega$           | Provide |  |  |  |
| 5.309       | Rotor Reactance @ Full Load                                             | $\Omega$           | Provide |  |  |  |
| 5.310       | Full Load Slip                                                          | %                  | Provide |  |  |  |
| 5.311       | Specified Temperature                                                   | $^{\circ}\text{C}$ | Provide |  |  |  |
| 5.312       | Magnetic Reactance ( $X_m$ )                                            | $\Omega$           | Provide |  |  |  |
| 5.313       | Magnetic Resistance ( $R_m$ )                                           | $\Omega$           | Provide |  |  |  |
| <b>6.0</b>  | <b>Motor Thermal Details</b>                                            |                    |         |  |  |  |
| <b>6.10</b> | <b>Temperature rise</b>                                                 |                    |         |  |  |  |
| 6.101       | Stator winding insulation class (Minimum class F)                       | Name               | F       |  |  |  |
| 6.102       | Stator winding temperature rise at 1.0 Service Factor (Maximum class B) | K                  | 80      |  |  |  |
| <b>6.20</b> | <b>Performance and Thermal Capacity</b>                                 |                    |         |  |  |  |
| 6.201       | Run-up time at 100% of rated voltage                                    | s                  | Provide |  |  |  |
| 6.202       | Run-up time at 85% of rated voltage                                     | s                  | Provide |  |  |  |
| 6.203       | Run-up time at 75% of rated voltage                                     | s                  | Provide |  |  |  |
| 6.204       | Maximum Hot Locked Rotor Time at 100% of rated voltage                  | s                  | Provide |  |  |  |
| 6.205       | Maximum Hot Locked Rotor Time at 85% of rated voltage                   | s                  | Provide |  |  |  |
| 6.206       | Maximum Hot Locked Rotor Time at 75% of rated voltage                   | s                  | Provide |  |  |  |
| 6.207       | Maximum Hot Acceleration Time at 100% of rated voltage                  | s                  | Provide |  |  |  |
| 6.208       | Maximum Hot Acceleration Time at 85% of rated voltage                   | s                  | Provide |  |  |  |
| 6.209       | Maximum Hot Acceleration Time at 75% of rated voltage                   | s                  | Provide |  |  |  |
| 6.210       | Are safe stall and acceleration times rotor or stator limited?          | Rotor / Stator     | Provide |  |  |  |
| 6.211       | Motor Current at Breakdown Torque                                       | A                  | Provide |  |  |  |
| 6.212       | Maximum Overload Time at Breakdown Torque Current from FLC operation    | s                  | Provide |  |  |  |
| 6.213       | Thermal time constant                                                   | Minutes            | Provide |  |  |  |
| 6.214       | Cooling time constant                                                   | Minutes            | Provide |  |  |  |
| 6.215       | Number of starts from Hot, within an hour                               | Number             | 2       |  |  |  |
| 6.216       | Number of starts from cold, within an hour                              | Number             | 3       |  |  |  |

|              |                                                           |                             |                          |  |                                  |
|--------------|-----------------------------------------------------------|-----------------------------|--------------------------|--|----------------------------------|
| <b>7.0</b>   | <b>Mechanical Details</b>                                 |                             |                          |  |                                  |
| <b>7.1</b>   | <b>Motor winding systems</b>                              |                             |                          |  |                                  |
| 7.101        | Method of stator winding Impregnation                     | Name                        | VPI                      |  |                                  |
| 7.102        | Stator winding type (form-wound / roebel bar, etc)        | Name                        | Form-wound               |  |                                  |
| 7.103        | Type of Wedges                                            | Epoxy Glass / Magnetic      | Magnetic                 |  |                                  |
| 7.104        | Squirrel cage rotor type                                  | Fabricated Cu/Al or Cast Al | Fabricated Cu            |  |                                  |
| 7.105        | Rotor Cage Type                                           | Single / Double             | Single                   |  |                                  |
| <b>7.2</b>   | <b>Enclosure and Cooling</b>                              |                             |                          |  |                                  |
| 7.201        | Enclosure - Degree of protection (IP Code)                | IP Code                     | 65                       |  |                                  |
| 7.202        | Cooling Method (IC code)                                  | IC Code                     | IC411                    |  |                                  |
| <b>7.203</b> | <b>Primary Air Cooler (Heat Exchanger):</b>               |                             |                          |  |                                  |
| 7.2031       | Type                                                      | CACA / CACW                 | TEFC                     |  |                                  |
| 7.2032       | Cooler Tube Material                                      | Describe                    | Provide                  |  |                                  |
| 7.2033       | CW Flow Rate                                              | Litres per minute           | NA                       |  |                                  |
| 7.2034       | CW Pressure                                               | kPa                         | NA                       |  |                                  |
| 7.2035       | CACW Cooler Leak Detectors                                | Yes / No                    | NA                       |  |                                  |
| 7.2036       | Location, if yes                                          | Describe                    | NA                       |  |                                  |
| 7.2037       | Type of Alarm Contact                                     | N/C or N/O                  | NA                       |  |                                  |
| <b>7.3</b>   | <b>Bearings</b>                                           |                             |                          |  |                                  |
| 7.301        | Bearing type (e.g. Ball or Roller or Sleeve)              | Name                        | Rolling element Bearings |  |                                  |
| 7.302        | Bearing size                                              | Name                        | Provide                  |  |                                  |
| 7.303        | Lubricant Grade                                           | Describe                    | Grease                   |  |                                  |
| 7.304        | Lubrication interval                                      | hrs                         | >= 4000                  |  |                                  |
| 7.305        | Bearing life                                              | hrs                         | >=100 000                |  |                                  |
| 7.306        | Bearing Oil Cooler                                        | Yes / No                    | No                       |  |                                  |
| 7.307        | Special Tube Material                                     | Describe                    | NA                       |  |                                  |
| 7.308        | Cooling Water Pressure                                    | kPa                         | NA                       |  |                                  |
| 7.309        | Cooling Water Flow Rate                                   | Litres per minute           | NA                       |  |                                  |
| 7.310        | Vibration Sensor                                          | Yes / No                    | NA                       |  |                                  |
| 7.311        | Vibration Sensor Type                                     | Describe                    | No                       |  |                                  |
| 7.312        | Easy Access Oil Top Up Plugs                              | Yes / No                    | No                       |  |                                  |
| 7.313        | Easy Access Oil Drain Plugs                               | Yes / No                    | No                       |  |                                  |
| 7.314        | Grease Relief Valve / Plug                                | Yes / No                    | Yes                      |  |                                  |
| 7.315        | Insulated Bearings                                        | Yes / No                    | Yes                      |  |                                  |
| 7.316        | Location of Bearing Insulation                            | Describe                    | OEM to determine         |  |                                  |
| <b>7.4</b>   | <b>Motor Size and Rotation</b>                            |                             |                          |  |                                  |
| 7.401        | Frame size                                                | Code                        | MS 400                   |  |                                  |
| 7.402        | Frame H(A/B/C)/D/E Dimensions as per IEC 60072-2          | Number                      | 400(686/1120/200)100/210 |  | using kendal S5 drawing -Item 45 |
| 7.403        | Rotor Moment of inertia                                   | kgm²                        | Provide                  |  |                                  |
| 7.404        | Motor total mass                                          | kg                          | Provide                  |  |                                  |
| 7.405        | Heat Exchanger Weight                                     | kg                          | Provide                  |  |                                  |
| 7.406        | Unidirectional Fans Acceptable?                           | Yes / No                    | No                       |  |                                  |
| 7.407        | Shaft Rotational Direction (DE View)                      | Describe                    | Bi-Directional           |  |                                  |
| <b>7.5</b>   | <b>Power Terminal Box/es:</b>                             |                             |                          |  |                                  |
| 7.501        | Main TB Location (DE View)                                | RHS / LHS / Top             | RHS                      |  |                                  |
| 7.502        | Main TB Phase Segregation                                 | Yes / No                    | No                       |  |                                  |
| 7.503        | Number of Terminals                                       | Number                      | 3 +3                     |  |                                  |
| 7.504        | Duplicate Terminals for Alternate Power Supply Connection | Yes / No                    | Yes                      |  |                                  |
| 7.505        | Parallel Terminals for Current Sharing                    | Yes / No                    | No                       |  |                                  |
| 7.506        | Blow Out Panel/s                                          | Yes / No                    | Yes                      |  |                                  |
| <b>7.6</b>   | <b>Auxiliary Terminal Box/es:</b>                         |                             |                          |  |                                  |
| 7.601        | Duplicate Auxiliary Terminal Boxes                        | Yes / No                    | Yes                      |  |                                  |
| 7.602        | Free Hand Specification                                   | Describe                    |                          |  |                                  |
| <b>7.7</b>   | <b>Vibration and Noise</b>                                |                             |                          |  |                                  |
| 7.701        | Bearing vibration limits                                  | mm/s                        | 240-50237155             |  |                                  |
| 7.702        | Noise level                                               | dB                          | 240-50237155             |  |                                  |

|            |                                                                                                      |                      |                     |  |  |  |
|------------|------------------------------------------------------------------------------------------------------|----------------------|---------------------|--|--|--|
| <b>8.0</b> | <b>Monitoring, Protection and Accessories</b>                                                        |                      |                     |  |  |  |
| <b>8.1</b> | <b>Temperature Measuring Devices</b>                                                                 |                      |                     |  |  |  |
| 8.101      | <b>Stator Winding Embedded Temperature Detectors (ETDs)</b>                                          | Yes / No             | Yes                 |  |  |  |
| 8.102      | Winding ETD Type                                                                                     | Thermocouple / RTD   | 3-Wire PT100 RTD    |  |  |  |
| 8.103      | Number per Phase                                                                                     | Number               | 2                   |  |  |  |
| 8.104      | <b>Primary Cooling Air Temperature Detectors</b>                                                     | Yes / No             | No                  |  |  |  |
| 8.105      | ETD Type                                                                                             | Thermocouple / RTD   | NA                  |  |  |  |
| 8.106      | Number to be Installed                                                                               | Number               | NA                  |  |  |  |
| 8.107      | <b>Bearing ETDs</b>                                                                                  | Yes / No             | Yes                 |  |  |  |
| 8.108      | ETD Type                                                                                             | Thermocouple / RTD   | Type-K Thermocouple |  |  |  |
| 8.109      | Number per Bearing                                                                                   | Number               | 1                   |  |  |  |
| 8.11       | <b>Other ETDs</b>                                                                                    | Part to be Monitored | No                  |  |  |  |
| 8.111      | ETD Type                                                                                             | Thermocouple / RTD   | NA                  |  |  |  |
| 8.112      | Number to be Installed                                                                               | Number               | NA                  |  |  |  |
| 8.113      | <b>Dial Type Temperature Indicators</b>                                                              | Yes / No             | Yes                 |  |  |  |
| 8.114      | Part/s to be Monitored                                                                               | Describe             | Bearing             |  |  |  |
| 8.115      | Indicator Type                                                                                       | Temp. Range          | 0-120               |  |  |  |
| 8.116      | Preferred Vendor Type                                                                                | Describe             | Provide             |  |  |  |
| <b>8.2</b> | <b>Differential Protection CTs:</b>                                                                  | Yes / No             |                     |  |  |  |
| 8.201      | Motor Supplied with Neutral Side CTs Installed                                                       | Yes / No             | No                  |  |  |  |
| 8.202      | CT Ratio                                                                                             | $I_p/I_s$            | NA                  |  |  |  |
| 8.203      | Knee Point Voltage                                                                                   | Volts                | NA                  |  |  |  |
| 8.204      | Max. $I_0$ @ $V_{kp}$                                                                                | Amps                 | NA                  |  |  |  |
| 8.205      | Class                                                                                                |                      | NA                  |  |  |  |
| 8.206      | Line Side CTs Already or to be Installed                                                             | Yes / No             | NA                  |  |  |  |
| 8.207      | Burden                                                                                               | VA                   | NA                  |  |  |  |
| 8.208      | Maximum Secondary Resistance                                                                         | $\Omega$             | NA                  |  |  |  |
| <b>8.3</b> | <b>Surge suppresser</b>                                                                              |                      |                     |  |  |  |
| 8.301      | Surge suppresser required                                                                            | Yes / No             | Yes                 |  |  |  |
| 8.302      | Make                                                                                                 | Name                 | Dry type            |  |  |  |
| 8.303      | Number to be Installed per machine                                                                   | Number               | 1x per phase        |  |  |  |
| 8.304      | Technical information reference number                                                               | Number               | provide             |  |  |  |
| <b>8.4</b> | <b>Partial Discharge Monitoring</b>                                                                  |                      |                     |  |  |  |
| 8.401      | Partial Discharge Capacitors (required for P $\geq$ 800 kW Draught Group and all motor $\geq$ 6.6kV) | Yes / No             | No                  |  |  |  |
| 8.402      | Partial Discharge Capacitors Specification, if any                                                   | Type                 | NA                  |  |  |  |
| 8.403      | Number PD Capacitors (3x1phase)                                                                      | Number               | NA                  |  |  |  |
| <b>8.5</b> | <b>Other Accessories:</b>                                                                            |                      |                     |  |  |  |
| 8.501      | Lightning Arresters                                                                                  | Yes / No             | no                  |  |  |  |
| 8.502      | Speed Switch                                                                                         | Yes / No             | no                  |  |  |  |
| 8.503      | Earthing Brush                                                                                       | Yes / No             | no                  |  |  |  |
| 8.504      | Reversing Shaft Interlock/Switch                                                                     | Yes / No             | no                  |  |  |  |
| <b>8.6</b> | <b>Space Heaters</b>                                                                                 |                      |                     |  |  |  |
| 8.601      | Installed                                                                                            | Yes / No             | Yes                 |  |  |  |
| 8.602      | Voltage Rating                                                                                       | Volts AC             | 220                 |  |  |  |
| 8.603      | Power Rating                                                                                         | W                    | provide             |  |  |  |
| 8.604      | "ON" Pilot Lamp                                                                                      | Yes / No             | No                  |  |  |  |
| <b>9.0</b> | <b>Interface to Plant</b>                                                                            |                      |                     |  |  |  |
| 9.01       | Motor mounting (Horizontal / Vertical) (Foot/Flange)                                                 | IM Code              | 1001                |  |  |  |
| 9.02       | Rotation (viewed on motor drive shaft) with U- V- W                                                  | Name                 | Bi-directional      |  |  |  |
| 9.03       | Maximum cable size that can fit on the terminal box                                                  | mm <sup>2</sup>      | 50                  |  |  |  |
| 9.04       | Direction of cable entry (Line terminal box view)                                                    | Top/Bot/Left/Right   | Bot                 |  |  |  |
| 9.05       | Cable type                                                                                           | Code                 |                     |  |  |  |
| 9.06       | Cable size                                                                                           | mm <sup>2</sup>      | TBD                 |  |  |  |
| 9.07       | Flood Lubricated Bearing Total Oil Flow                                                              | Litres per minute    | NA                  |  |  |  |
| 9.08       | Oil Pressure                                                                                         | kPa                  | NA                  |  |  |  |
| 9.09       | Inlet Oil Temperature Range                                                                          | °C                   | NA                  |  |  |  |
| 9.10       | Water Cooled Bearing Total H <sub>2</sub> O Flow                                                     | Litres per minute    | NA                  |  |  |  |
| 9.11       | Water Pressure                                                                                       | kPa                  | NA                  |  |  |  |
| 9.12       | Inlet Water Temperature                                                                              | °C                   | NA                  |  |  |  |

|             |                                                                                                                       |                  |                                          |  |  |  |
|-------------|-----------------------------------------------------------------------------------------------------------------------|------------------|------------------------------------------|--|--|--|
| <b>10.0</b> | <b>Motor Painting</b>                                                                                                 |                  |                                          |  |  |  |
| 10.01       | Paint Finish                                                                                                          | Standard/Special | Standard                                 |  |  |  |
| 10.02       | Number of Anti-rust Primer Coats                                                                                      | Number           | 2                                        |  |  |  |
| 10.03       | Internal Metal Surface Finish                                                                                         | Describe         | Provide                                  |  |  |  |
| 10.04       | External Metal Surface Finish                                                                                         | Describe         | Provide                                  |  |  |  |
| 10.05       | External Final Color Coding                                                                                           | BS 381 Code      | G29 (Grey)                               |  |  |  |
| <b>11.0</b> | <b>Station Limitations</b>                                                                                            |                  |                                          |  |  |  |
| 11.01       | Maximum Motor Mass                                                                                                    | Ton              | 3                                        |  |  |  |
| 11.02       | Maximum Overall Motor Height                                                                                          | mm               | 1100                                     |  |  |  |
| 11.03       | Maximum Overall Motor Length                                                                                          | mm               | 1880                                     |  |  |  |
| 11.04       | Maximum Overall Motor Breadth                                                                                         | mm               | 1700                                     |  |  |  |
| 11.05       | Other                                                                                                                 | Describe         | Motor to fit on existing base            |  |  |  |
| <b>12.0</b> | <b>Documentation</b>                                                                                                  |                  |                                          |  |  |  |
| <b>12.1</b> | <b>Drawings</b>                                                                                                       |                  |                                          |  |  |  |
| 12.101      | Motor Outline Drawing reference number                                                                                | Number           | Supplier to provide                      |  |  |  |
| 12.102      | Power winding schematic diagrams and Auxiliaries schematic diagrams (PT100s, thermistor and heaters) reference number | Number           | Supplier to provide after contract award |  |  |  |
| <b>12.2</b> | <b>Motor Curves</b>                                                                                                   |                  |                                          |  |  |  |
| 12.201      | Torque-speed curves plotted over the driven machine torque-speed curve at 100%, 85% and 75% Voltage reference number  | Number           | Supplier to provide                      |  |  |  |
| 12.202      | Current-speed curves at 100%, 85% and 75% Voltage                                                                     | Number           | Supplier to provide                      |  |  |  |
| 12.203      | Efficiency and Power factor vs. load curves at rated voltage reference number                                         | Number           | Supplier to provide                      |  |  |  |
| 12.204      | Thermal limit curves reference number                                                                                 | Number           | Supplier to provide                      |  |  |  |
|             |                                                                                                                       |                  |                                          |  |  |  |