

	<p style="text-align: center;">Tender Specification</p>	<p style="text-align: center;">GCS/IDM</p>
---	---	--

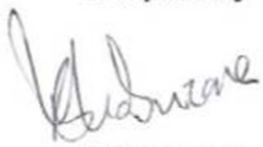

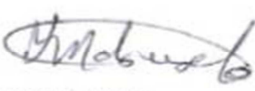

Title: **REQUIREMENTS FOR SOLAR WATER HEATER SUPPLIERS**      Unique Identifier: **240-53410492**

Documentation Type: **SP**

Revision: **4**

Total Pages: **20**

Disclosure Classification: **PUBLIC DOMAIN**

<p><b>Compiled by</b></p>  <p><b>B Mabuzane</b> Eskom IDM SWH Project Manager Date: 15/05/13</p>	<p><b>Recommended by</b></p>  <p><b>R Pandaram</b> Eskom IDM SWH Programme Manager Date: 15/05/13</p>	<p><b>Accepted by:</b></p>  <p><b>X Mabusela</b> DoE Director: Energy Efficiency Date: 15/05/13</p>	<p><b>Authorized by:</b></p>  <p><b>F Segole</b> Eskom IDM Delivery Manager Date: 15/05/2013</p>
---	--	---	---



**energy**

---

Department:  
Energy  
**REPUBLIC OF SOUTH AFRICA**

**CONTENTS**

	Page
<b>1. INTRODUCTION .....</b>	<b>3</b>
<b>2. SUPPORTING CLAUSES.....</b>	<b>3</b>
2.1 SCOPE .....	3
2.2 NORMATIVE/INFORMATIVE REFERENCES.....	3
2.3 DEFINITIONS.....	4
2.4 ABBREVIATIONS.....	5
<b>3. INFORMATION TO TENDERING SUPPLIERS .....</b>	<b>5</b>
<b>4. SCOPE OF SWH SUPPLIERS .....</b>	<b>6</b>
<b>5. GENERAL REQUIREMENTS .....</b>	<b>7</b>
5.1 LOCAL SYSTEMS.....	7
5.2 EXPERIENCE .....	7
5.3 CAPACITY.....	7
5.4 RECORDS.....	8
<b>6. TECHNICAL REQUIREMENTS.....</b>	<b>8</b>
6.1 SYSTEM REQUIREMENTS.....	8
6.2 EVACUATED TUBE SOLAR COLLECTORS .....	9
6.3 FLAT PLATE COLLECTORS.....	9
6.4 SOLAR WATER HEATING SYSTEMS MOUNTING STRUCTURES.....	9
6.5 HEATING CIRCUIT AND CONNECTING PIPE WORK .....	10
6.6 DRIP TRAYS HP .....	11
6.7 CISTERN TANK .....	11
6.8 VACUUM BREAKER VALVES HP.....	11
6.9 NON-RETURN VALVES .....	11
6.10 PRESSURE CONTROL VALVES .....	12
6.11 HOT WATER STORAGE TANK.....	12
6.12 TEMPERING VALVES .....	12
6.13 COMPONENTS AND MATERIAL .....	12
6.14 WAREHOUSING .....	12
6.15 TRAINING .....	13
6.16 SYSTEM DOCUMENTATION AND USER INSTRUCTION BOOKLET .....	13
<b>7. COMPLIANCE REQUIREMENTS .....</b>	<b>14</b>
7.1 CODES AND REGULATIONS .....	14
<b>8. SAFETY, HEALTH AND ENVIRONMENTAL REQUIREMENTS .....</b>	<b>14</b>
<b>9. QUALITY REQUIREMENTS.....</b>	<b>14</b>
9.1 ACKNOWLEDGEMENT .....	14
9.2 QUALITY MANAGEMENT SYSTEM .....	15
9.3 PROJECT QUALITY PLAN .....	18
9.4 INSPECTION AND TEST PLAN .....	18
<b>10. FINANCIAL REQUIREMENTS .....</b>	<b>19</b>
<b>11. COMMERCIAL REQUIREMENTS.....</b>	<b>19</b>
11.1 GUARANTEES.....	19
<b>12. REVISIONS .....</b>	<b>20</b>
<b>13. DEVELOPMENT TEAM .....</b>	<b>20</b>

**PUBLIC DOMAIN**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

## 1. INTRODUCTION

Eskom is in the process of procuring SWH systems to be installed in Municipal areas selected by the Department of Energy (DoE). This document forms part of the tender document to support the implementation of the initiative and all appointed contractors will adhere to conditions set in the NEC.

## 2. SUPPORTING CLAUSES

### 2.1 SCOPE

This document defines the requirements for the **supply** of non-pressure (gravity fed/ cistern) type or high pressure (HP) Solar Water Heating systems for installation in low cost housing in the Municipal areas.

This requirement serves as a guideline for the design and manufacture of solar equipment including a complete installation kit for the installation of the SWH systems to the required standards. The Supplier shall propose and supply suitable type of equipment to meet these requirements.

#### 2.1.1 PURPOSE

The purpose of this document is to specify the minimum requirements that Suppliers have to comply with in order to be considered for the Solar Water Heater programme.

#### 2.1.2 APPLICABILITY

This document is applicable to all suppliers that intend to participate in the Solar Water Heater programme.

## 2.2 NORMATIVE/INFORMATIVE REFERENCES

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

### 2.2.1 NORMATIVE

- |     |                                 |   |
|-----|---------------------------------|---|
| [1] | SANS 151: 2010                  | Fixed Electric Storage Water Heaters  |
| [2] | SANS 198                        | Functional-Control Valves and Safety Valves for Domestic Hot and Cold Water Supply    |
| [3] | SANS 241-1:2011                 | Drinking water Part 1: Microbiological, physical, aesthetic and chemical determinands |
| [4] | SANS 752:2009                   | Float valves  |
| [5] | SANS 1307 (SABS 1307) (2009)    | Domestic solar water heaters  |
| [6] | SANS 6210 (SABS SM 1210) (1992) | Domestic Solar Water Heaters - Mechanical Qualification Tests                         |
| [7] | SANS 6211-1: 2012               | Domestic solar water heaters Part 1: Thermal performance using an outdoor test method |

### PUBLIC DOMAIN

- [8] SANS 6509 Corrosion of metals and alloys - Determination of dezincification resistance of brass
- [9] SANS 10106: 2006 The Installation, Maintenance, Repair and Replacement of Domestic Solar Water Heating Systems
- [10] SANS 10252 – part 1 Water Supply & Drainage for Buildings
- [11] SANS 10254: 2012 The installation, maintenance, replacement and repair of fixed electric storage water heating systems
- [12] SANS 10400 (SABS 0400) The application of the National Building Regulations – Particularly Part A, B, L, XA
- [13] SANS 60335-2-21: 2000 Safety of household and similar electrical appliances Part 2-21: Particular requirements for storage water heaters
- [14] SATS 1286:2011 Local Goods, Services and Works measurement and Verification of Local Content
- [15] OHS Act Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
- [16] WSA Water Services Act, 1977 (Act No. 108 of 1977)
- [17] CPA Consumer Protection Act, 2008 (Act No 68 of 2008) – particularly clauses 49, 55, and 61 – 66
- [18] 32-1188 Eskom Health and Safety Management Supplier Requirements
- [19] Local Government, Municipal Systems Act, 2000 (Act No. 32 of 2000) – particularly the local water By-Laws
- [20] Installation standards

NOTE: Copies of SANS standards are available from SABS, as amended from time to time.

### **2.2.2 INFORMATIVE**

- [21] 240-51544462 IDM Quality Requirements for Suppliers
- [22] ISO 9001 Quality Management Systems – Requirements
- [23] ISO 10005 Quality Management Systems - Guidelines for Quality Plans

## **2.3 DEFINITIONS**

### **2.3.1 CLASSIFICATION**

- a. Public domain: published in any public forum without constraints (either enforced by law, or discretionary).

### **PUBLIC DOMAIN**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

**2.4 ABBREVIATIONS**

<b>Abbreviation</b>	<b>Description</b>
DoE	Department of Energy
CETA	Construction Education and Training Authority
IDM	Integrated Demand Management
IOPSA	Institute of Plumbing South Africa
ISO	International Organisation for Standardisation
JASWIC	Joint Acceptance Scheme for Water Installation Components
kPa	Kilo Pascal
OEM	Original Equipment Manufacturers
PIRB	Plumbing Industry Registration Board
PMO	Project Management Office
QCTO	Quality Council for Trades and Occupations
SABS	South African Bureau of Standards
SANS	South African National Standard
SD&L	Supplier Development and Localisation
SETA	Sector Education and Training
SWH	Solar Water Heater
SHE	Safety Health and Environment
SATS	South African Technical Specification
SANAS	South African National Accreditation System

**3. INFORMATION TO TENDERING SUPPLIERS**

- 3.1 The supply and installation of SWH systems shall be done in the Municipal area designated in the tender Request for Proposal (RFP).
- 3.2 The chlorine content of the water as tested during the feasibility studies (specific point in time), have complied with drinking water quality, as defined in SABS 241:2011. The supplier is responsible to verify the water quality and recommend a suitable approved system that will be suitable to the variable site conditions.
- 3.3 The water quality as tested during the feasibility studies (specific point in time), have complied with drinking water quality, as defined in SABS 241:2011. The supplier is responsible to verify the water properties that may influence system performance and lifetime (such as chlorine content and hardness) and recommend a suitable approved system that will be suitable to the variable site conditions (also refer to SANS 1307 Annex C).

**PUBLIC DOMAIN**

3.4 It is recommended that an in-line serviceable filter be installed. This must then be provided as part of the SWH Installation kit, and also included in the list of maintenance parts.

#### **4. SCOPE OF SWH SUPPLIERS**

- 4.1 To manufacture and supply 100l/110l SWH systems and complete installation kits.
- 4.2 The kit shall be put together such that no additional components, parts or installation material have to be procured after delivery of the SWH and complete installation kit by the supplier.
- 4.3 As part of the tender submission, the supplier shall supply Eskom with a list of all the components contained in the SWH system together with certification/test reports for these, full colour photos of each component making up the installation kit must be provided with the tender submission, clearly showing the product markings.
- 4.4 The supplier shall provide a 5 year warrantee for the SWH systems. For submission purposes, the warrantee clauses must be clearly stated.
- 4.5 Warehouse selection and setup as required (to accommodate at least 2500 SWH systems at any point in time- specifically for Buffalo City Municipality) and in coordination with the PMO.
- 4.6 All systems are to be pre-assembled at a local warehouse close to the installation site.
- 4.7 Development and execution of the implementation plan.
- 4.8 Development and implementation of a training plan for installers and maintainers.
- 4.9 Installer training and skills development by approved/accredited IOPSA solar trainer, SAQA (unit standard 244499), SETA and QCTO approved; training shall include on-site practical training. Installers shall be issued with a certificate with a declaration of competency. The suppliers shall be responsible to train the installers thus the risk of installation lies with the supplier and the 5 year system warrantee is not affected by the quality of the installation of the system. If the systems are not installed appropriately due to inadequate training or poor workmanship, the supplier shall be accountable.
- 4.10 Project management plan, including scope management, logistics management, time management and financial management, quality management, management of communications, risk management.
- 4.11 The project management plan must specifically include the manufacturing and supply schedule.
- 4.12 Development of a Maintenance Procedure to honour the 5 year warranty. This procedure shall include all spare parts that will be required for the warranty period.
- 4.13 Communicate problems, risks and mitigation to the PMO, ensuring a two-way communication channel. Feedback to be provided to Eskom and DoE.

#### **PUBLIC DOMAIN**

4.14 Progress reporting to the appointed PMO.

4.15 Weekly feedback to the PMO for feedback to Eskom and DoE on the status of manufacture.

4.16 Report on deviation from schedule (when applicable).

4.17 Weekly register of man-hours to the appointed PMO.

## **5. GENERAL REQUIREMENTS**

Tender will be open to both HP (high pressure) and LP (low pressure) cistern-type suppliers at the normalised unit price. There will be no electrical backup for HP systems thus the element space for these must be blanked out in accordance with the national standards.

### **5.1 LOCAL SYSTEMS**

The SWH sector is a designated sector in terms of the PPPFA, and the stipulated minimum threshold for local production and content for Solar Water Heater Components (tanks and collectors only) is 70%.

Only Original Equipment Manufacturers, OEMs with verifiable and traceable local content within RSA may tender. Local content shall be declared and evaluated according to SATS 1286. Tenderers failing to comply will not proceed to the evaluation process. Subject to certification by a SANAS accredited verification body and onsite factory audit.

### **5.2 EXPERIENCE**

**5.2.1** Suppliers must have a proven track record in manufacturing and/or dealing with solar water geysers.

**5.2.2** As part of the tender submission, the Supplier must provide Eskom with a description of previous similar work, including summary of lessons learnt during the implementing of the referenced projects.

**5.2.3** Suppliers should have experience in providing training in order to train the Installers, and provide competency certificates to trainees.

### **5.3 CAPACITY**

**5.3.1** Suppliers must be able to manufacture and supply at least 1500 complete systems per month. Supplier must have at least 1000 completed kits available in stock.

**5.3.2** Evidence of the capacity is required (e.g. Factory capacity, number of staff, stock lists).

## **PUBLIC DOMAIN**

**5.4 RECORDS**

All records related to this SWH supply and installation project shall be provided to the PMO for record keeping purposes for the duration of the projects. Within 2 weeks of project completion and close-out all records shall be handed over to Eskom and Eskom shall keep the records in accordance with their records control procedure.

**6. TECHNICAL REQUIREMENTS**

**6.1 SYSTEM REQUIREMENTS**

- 6.1.1** SABS Mark approved systems only. A complete copy (inclusive of all schedules) of the mark approved document to be submitted for evaluation. Equipment test & acceptance certificates shall be provided with the tender submission. The minimum q – factor will be 9 megajoules (MJ) and above per 100 litres at 16mj/m<sup>2</sup> (average for the country). If the solar water heater does not comply with the above mentioned q-factor requirements, the system will not qualify.
- 6.1.2** The supplier shall be required to provide local material sourcing certificates for the equivalent number of units required by Eskom. These will subject to quality assurance audits.
- 6.1.3** Systems must be manufactured (OEM) by tendering supplier.
- 6.1.4** The installed system must be able to handle a supply pressure of at least 800 kPa.
- 6.1.5** The entire installation shall comply with SANS 10254, SANS 10252-1 and SANS 10106.
- 6.1.6** The warranty on the tank, collector and tubes, installation materials, pipework and fittings shall be 5 years. Evidence of how the warranty will be maintained over the five years (e.g. Warranty management plan, or evidence of insurance) shall be provided to Eskom. The evidence/plan shall clearly indicate the responsibilities of the supplier and the installers.
- 6.1.7** The systems and installation will be freeze resistant, if installed in a frost prone area, in accordance with SANS 10106. Submit proof of compliance.
- 6.1.8** Only systems that are confirmed by the SABS to be freeze-tolerant systems shall be registered as such. The system must be rated by the SABS as one of the following:

Rating	Suitability
Direct (not frost resistant)	May not be installed in frost prone areas
Indirect	May be installed in frost prone areas
Direct frost-resistant	May be installed in frost prone areas (maintenance plan must be in place)

**6.1.9** Frost areas are classified as:

- a) any area where the air temperature drops below 4 degree Celsius at any time

**PUBLIC DOMAIN**



- b) any area above the escarpment (non-coastal areas)
- c) any area that is prone to frost spells

**6.1.10** Suppliers must use the same freeze protection mechanisms as systems were tested and passed for, these mechanisms must be amended as and when the SABS standards are amended.

**6.1.11** Direct systems that are not freeze tolerant systems and may not be installed in areas that are known to be susceptible to frost. If non-freeze-tolerant systems are installed in areas that are known to have frost no payments will be made for these systems.

**6.1.12** All systems should be maintained on a regular basis. Direct frost-resistant systems making use of a freeze protection mechanism (e.g. batteries, controllers etc.) should be maintained each year as part of the maintenance contract.

**6.1.13** Customers must be informed in writing of the risks and maintenance issues around these systems and their mechanisms failing (e.g. Instruction booklet). This is as per the 1307 requirements and per the consumer protection act. Participants are required to leave the customers with their contact details in case of system failure, faults and installation issues.

**6.1.14** If systems are damaged by frost/freezing (under the certified frost conditions tested by SABS) within the five year warrantee period then the supplier is liable for any damages and shall be required to repair such related damages. This must be provided for in the warrantee.

## **6.2 EVACUATED TUBE SOLAR COLLECTORS**

**6.2.1** The solar collector's arrangement shall be suitable for mounting at a suitable horizontal angle of tilt on the roofs of the buildings.

**6.2.2** The tubes shall have an absorber coating all round (360°) the inner wall of the vacuum.

**6.2.3** If the collectors come with reflectors, these shall be v-shaped stainless steel or non-corrosive reflectors and with special mounting to the structure in the appropriate position.

**6.2.4** The supplier shall identify the SANS standard to which it intends to comply. The applicable standard shall be presented to Eskom and traceable certification from a reputable accredited test facility shall be included in the submission. Any modifications to the system shall require full re-testing of the entire system by an accredited test facility.

**6.2.5** The collectors shall have a hail rating compliant with SANS 6210.

## **6.3 FLAT PLATE COLLECTORS**

Flat plate collectors shall comply with SANS 1307.

## **6.4 SOLAR WATER HEATING SYSTEMS MOUNTING STRUCTURES**

**6.4.1** The collectors (and storage tanks, where applicable) of the SWH systems shall be mounted on the existing roofs of the buildings and secured to the roof beams or purlins.

**PUBLIC DOMAIN**

- 6.4.2** The mounting structures shall be designed to enable mounting the SWH system securely at the required horizontal angle of tilt and oriented to true north with a maximum deviation of 45° to north east or north west with the lowest edge of the collector 50 mm above the roof cover material and bolted to the roof support structure.
- 6.4.3** The supplier must ensure that the system mounting structures are appropriate and securely braced against side loads as required in SANS 1307. Building regulations requirements of a maximum loading of 400 kg must not be exceeded and the foot plates shall be large enough to spread the point load to prevent damage to the roof cover material as required in SANS 1307.
- 6.4.4** The mounting structures shall be designed to prevent any build-up of debris behind the solar collector.
- 6.4.5** The mounting structures shall enable the removal of individual collectors in any single system without removal of adjacent collectors.
- 6.4.6** The mounting structures shall be made from, at least, mild steel which has been hot dip galvanised in accordance with national code of standard SABS 763, or of materials with known superior corrosion protection.
- 6.4.7** Suppliers' systems shall comply with the latest SANS 10106 specification with respect to mounting practices.

## **6.5 HEATING CIRCUIT AND CONNECTING PIPE WORK**

- 6.5.1** The interconnecting collector loop pipe work shall be of sufficient diameter to allow optimal circulation by thermo siphoning, with a minimum diameter of 22 mm.
- 6.5.2** In all cases long bends are preferred to elbow fittings. Failure to adhere to this automatically disqualifies the installation for payment.
- 6.5.3** All connections shall be compression-type connections to facilitate maintenance. Soldering is not allowed.
- 6.5.4** Allowance shall be made for thermal expansion of the piping system and the absorber.
- 6.5.5** Thermal insulation such as Thermoflex or equivalent shall be correctly installed on the collector loop and on hot and cold pipes as required in SANS 10252-1 and SANS 10106. Protection shall be provided to the insulation to prevent ingress of moisture and degradation due to sunlight and weather.
- 6.5.6** The piping insulation shall have an r value (insulation rating) of no less than 1.0 and if the insulation is materially damaged within a period of 6 months after installation the participating supplier or distributor must replace it at his own cost.
- 6.5.7** The system shall be installed without an electrical back-up and no provision made on the tank for electrical back up.

**6.5.8** If a SWH system without electrical backup is a registered SWH system, then at no time during the SWH programme may the registered SWH system be fitted or used in conjunction with any sort of electrical back up, unless the SWH system is retested and re-registered as such.

**6.5.9** The installation of the interconnecting pipe work shall have continuous upward and downward slopes without high points to prevent airlocks on thermosiphon systems and on the hot discharge pipes on cistern type installations.

**6.5.10** Roof penetration flashing material shall be provided with UV and weather protection, if the flashing is not entirely of corrosion resistant metal.

**6.5.11** All pipes, materials, systems, taps, valves and installations shall comply with the requirements of SANS 10252-1 and SANS 10254 including flushing and testing requirements as well as tests and markings according to SANS 6509.

**6.5.12** Unless galvanic action is unlikely to occur, or unless effective measures are taken to prevent such deterioration, metal pipes and components of different materials shall, as far as possible, not be connected to one another (refer to SANS 10106).

**6.5.13** No plastic or composite pipes may be used outside of the houses.

**6.5.14** Ball valves shall be of the lever type and shall comply with SANS 1056-3. Gate valves shall comply with SANS 776 and shall be used for isolation only, and not for flow regulation.

## **6.6 DRIP TRAYS HP**

**6.6.1** Split units will require drip trays, where these are not already installed.

**6.6.2** Drip trays shall comply with SANS 1848 and shall be installed in compliance with SANS 10254.

## **6.7 CISTERN TANK**

**6.7.1** The cistern support brackets or collars shall form part of the SWH system support structure and shall comply with SANS 151.

**6.7.2** The cistern and float valve shall comply with SANS 151. The float valve shall be capable of operating at temperatures of up to 95°C at pressures of up to 800 kPa.

**6.7.3** The float valve shall comply with SANS 752.

## **6.8 VACUUM BREAKER VALVES HP**

The expansion relief valves shall comply with SABS 198.

## **6.9 NON-RETURN VALVES**

**6.9.1** The cold water inlet pipe work requires an anti-siphon loop that complies with the requirements of SANS 10254.

**PUBLIC DOMAIN**

**6.9.2** As balanced pressure systems are required, no non-return valves are required on the hot water outlet.

**6.9.3** The non-return valves shall be of the light weight spring-type and shall comply with SANS 1808-10.

**6.9.4** Non-return valves shall be suitable for installation in any orientation.

## **6.10 PRESSURE CONTROL VALVES**

**6.10.1** Pressure control valves shall be required to regulate the supply to the SWH system for operating at the pressures prescribed in SANS 151.

**6.10.2** The pressure control valves shall comply with SABS 198.

## **6.11 HOT WATER STORAGE TANK**

**6.11.1** The hot water storage tank shall comply with SANS 1307 and SANS 151.

**6.11.2** The drain cocks shall comply with SANS 1808-53.

## **6.12 TEMPERING VALVES**

A correctly installed tempering valve that complies with SANS 1299 is mandatory on every installation.

## **6.13 COMPONENTS AND MATERIAL**

Only materials as referenced on the *Jaswic* website ([www.jaswic.co.za](http://www.jaswic.co.za)) shall be accepted.

## **6.14 WAREHOUSING**

**6.14.1** The supplier shall provide warehousing at the installation site (in cooperation with the PMO).

**6.14.2** The size of the warehouse must be able to accommodate the accumulated stock as specified, as well as have space for the pre-assembly and installer training as required by the supplier.

**6.14.3** All systems will be pre-assembled at the warehouse. The warehousing shall comply with identified suitable standards and will be inspected by the PMO and Eskom quality to ensure good storage and good housekeeping practices are followed.

**6.14.4** The warehouse shall be set up within 30 km radius of allocated installation site

**6.14.5** The supplier shall be responsible for all products and equipment until hand-over to the warehouse.

## 6.15 TRAINING

**6.15.1** The successful supplier will provide *product* and product specific installation training to the Eskom appointed installers using SAQA (unit standard 244499). A minimum of 30 people (per appointed company) shall be trained and training certificates and training records (type of training, training material, duration of training, accreditation, etc.) are to be provided to Eskom.

**6.15.2** Training must include:

- a) All solar water heaters should be installed in a proper shade-free area.
- b) Ideally, the entire SWH system should be located closest to the place where most hot water is used without compromising the need to locate the SWH system in a shade-free area as indicated above, or compromising the need to place the SWH system on a supportive roof structure.
- c) SWH systems shall not be installed where water leakage can wet the electrical Distribution Boards, or electrical plugs.
- d) No damage to existing house structures or roofs will be acceptable.

**6.15.3** Training shall be provided to the installers on the user instruction booklet, to enable the Installer to provide instructions to the users.

## 6.16 SYSTEM DOCUMENTATION AND USER INSTRUCTION BOOKLET

**6.16.1** For each batch of SWH systems supplied, the following documentation shall be supplied in English to Eskom:

- a) Equipment test certificates from SABS AND SABS mark approval. Part 2, conformity certificates, part 5 SABS
- b) Equipment drawings or diagrams, clearly demonstrating the operating principles (may be included in the User Instruction Booklet).
- c) Documentation of safety reviews (if any)
- d) SABS approved installation manuals (User Instruction Booklet) to be provided.
- e) Functional description of the equipment (how it works) (may be included in the User Instruction Booklet).

**6.16.2** For each SWH system and installation kit supplied, the following documentation shall be supplied in English to Eskom as part of the installation kit:

- a) User Instruction Booklet for safe use of the equipment to be supplied with each system.
- b) Maintenance manuals describing the maintenance requirements (may be included in the User Instruction Booklet)
- c) List of recommended replacement parts (i.e. wear parts) (may be included in the User Instruction Booklet).

**6.16.3** User instruction booklet requirements

- a) The last page of the User Instruction Booklet shall be perforated for ease of removal.

**PUBLIC DOMAIN**

- b) The last 2 pages shall contain the same information (one to remain with the user, one to be removed by the Installer as record of hand-over), namely
- i. The Supplier's contact details
  - ii. The Installer's contact details
  - iii. Contact details for customer complaints or queries
  - iv. Space for sign-off by the Installer that the system has been successfully installed
  - v. Space for the User to sign that he/she has received the SWH system, that it has been demonstrated to be in working order, and that he/she has received basic training in the use and maintenance of the system.

## **7. COMPLIANCE REQUIREMENTS**

The SWH systems shall be supplied in accordance with the latest revisions and amendments, and membership, of the following:

### **7.1 CODES AND REGULATIONS**

The applicable SABS Standard and Codes of Practice or the relevant BS or IEC Standards or Codes of Practice where no SABS Standards or Codes of Practice exists, and the listed codes, standards and regulations listed in section 2.2.1.

## **8. SAFETY, HEALTH AND ENVIRONMENTAL REQUIREMENTS**

- 8.1 Over and above the Occupational Health and Safety Act, the supplier shall comply with the Eskom specified Safety Health and Environment (SHE) requirements. This document is part of the tender data.
- 8.2 The Supplier shall be required to compile a SHE file at the onset of the project, and maintain the file throughout the execution of the project, as specified.
- 8.3 The Supplier shall provide the home owner with the appropriate safety, operation and maintenance documentation as required in terms of SANS 10254, SANS 1307 and SANS 10106, as well as the requirements of Section 49 of the Consumer Protection Act.

## **9. QUALITY REQUIREMENTS**

The Supplier shall comply with the Quality Requirements specified below.

### **9.1 ACKNOWLEDGEMENT**

By submission of any tender proposal to Eskom, the Supplier agrees to give Eskom and the DoE access at all reasonable times before, during and after manufacture and before, during and after delivery, construction, installation and commissioning to assess, measure, test and inspect the Supplier's, its sub-suppliers' and its sub-contractors' capacity and capability, products and workmanship as necessary on the Supplier's, its sub-suppliers' and its sub-contractors' premises and/or project sites.

**PUBLIC DOMAIN**

## **9.2 QUALITY MANAGEMENT SYSTEM**

In order to comply with Eskom QMS requirements, the Supplier must document and implement their QMS to Eskom. This may form part of the Project Quality Plan.

A Quality Management System (QMS) consists of the following:

- a) Quality policy (to include quality objectives);
- b) Quality Manual (aligned with ISO 9001);
- c) The six ISO 9001 mandatory procedures (Document Control, Record Control, Internal Auditing, Control of Non-Conformities, Corrective Action and Preventive Action);
- d) Business Processes for which work instructions, standard operating procedures or work procedures are required shall be identified and documented.

To demonstrate their Quality Management System, the Supplier must submit evidence of the items listed below as part of the tender submission, and implement it throughout the project.

### **9.2.1 EVIDENCE OF THE EXTENT OF THE QUALITY MANAGEMENT SYSTEM:**

#### **9.2.1.1 One of the following**

- a) Quality Management Policy and a copy of ISO 9001:2008 certification; or
- b) Quality Management Policy and a copy of Quality Manual that complies with ISO 9001:2008, including compliance audit report; or
- c) Quality Management Policy, a copy of Quality Manual; or
- d) Quality Management Policy or Quality Management Statement,

#### **9.2.1.2 Additional applicable documented business processes or procedures**

### **9.2.2 DOCUMENTATION REQUIREMENTS**

Description of, or procedure for, control of documents and records.

### **9.2.3 MANAGEMENT RESPONSIBILITY**

**9.2.3.1** The Supplier's Quality Management function shall be independent from those performing the work.

**9.2.3.2** The Supplier shall implement a training programme/plan to ensure that suitably qualified people perform the work as set out in the scope of work and according to required legislation, standards and specification as applicable. Records of all training shall be kept. Roles and responsibilities shall be clearly communicated.

### **9.2.4 RESOURCE MANAGEMENT**

The Supplier shall ensure that adequate resources are available to perform the work according to the specified requirements. A list of available resources (or organization chart) and their CV's shall be provided to Eskom.

**PUBLIC DOMAIN**

**9.2.5 PLANNING OF PRODUCTION AND SERVICE REALISATION**

**9.2.5.1** The Supplier shall have an established Project Management process

**9.2.5.2** A Risk register shall be compiled by the Supplier, and shall include risks in terms of the whole value chain of the project, i.e. technology, manufacture, procurement, installation, maintenance, and shall include risks associated with the Supplier's sub-suppliers and sub-contractors. Risks shall be managed throughout the execution of the project.

**9.2.6 PROCUREMENT**

**9.2.6.1** Description of, or procedure for, Control of Procurement.

**9.2.6.2** The process or procedure shall make provision for specification of requirements for procured products. Records of the specifications shall be kept.

**9.2.6.3** The process or procedure shall make provision for verification of procured products on receipt. Records of inspection and acceptance shall be kept.

**9.2.6.4** Description of, or procedure for, Control of the Supplier's Sub-Suppliers.

**9.2.6.5** The process or procedure shall include criteria for selection of suppliers, as well as what circumstances would lead to the suppliers not being used for further/future work.

**9.2.6.6** The Supplier shall make available to Eskom its list of sub-suppliers, including their scope of supply and sourcing certification for audit purposes.

**9.2.7 PRODUCTION AND SERVICE PROVISION**

**9.2.7.1** Description of, or procedure for, Control of Sub-Contractors.

**9.2.7.2** The process or procedure shall include criteria for selection of sub-contractors, as well as what circumstances would lead to the sub-contractors not being used for further/future work.

**9.2.7.3** The Supplier shall supply Eskom with a list of its sub-contractors, including their scope of work.

**9.2.7.4** Where special processes, such as welding and NDT are utilized, all the requirements from applicable codes, standards, specifications and regulations shall be implemented, and records kept.

**9.2.7.5** The Supplier shall demonstrate that the equipment comply with SANS standards and carry the SABS mark.

**9.2.7.6** The Supplier shall ensure that traceability is maintained and that all applicable material, components, equipment, and installations are identified and traceable to the original batch of manufacture/supply and to the Installer.

**9.2.7.7** The Supplier shall ensure that preservation of products or equipment is done in such a way that the products or equipment are adequately protected during shipping and transport, storage and preservation.

**PUBLIC DOMAIN**



**9.2.7.8** The Supplier shall ensure that adequate inspection of the products and equipment are done to confirm that no damage has taken place.

**9.2.7.9** In case of damage being identified during or after shipping and transport, storage and preservation, a non-conformance shall be raised.

**9.2.7.10** Adequate stock control shall be implemented.

### **9.2.8 CONTROL OF MEASUREMENT DEVICES**

The Supplier shall ensure that measuring and test equipment (e.g. pressure indicators) are calibrated, and calibration records are kept.

### **9.2.9 MEASUREMENT, ANALYSIS AND IMPROVEMENT**

#### **9.2.9.1 CUSTOMER SATISFACTION**

- a) Suppliers are to provide the description of, or procedure for, measurement of customer satisfaction, and for handling customer complaints. Note that the communication channel specified shall be maintained for the total duration of all contacts between Eskom, the Supplier, the PMO and the customer/ end user. The procedure shall clearly state the relationship and division of the roles and responsibilities between the SWH Supplier and Installer.
- b) Suppliers are to provide the description of, or procedure for, implementing guarantees on products, equipment and installations including how it will be maintained for the life of guarantee and contract with Eskom.

#### **9.2.9.2 INTERNAL AUDIT**

- a) Description of, or procedure for, Internal and Supplier Audits.
- b) The Supplier shall establish and implement an Internal and Supplier Audit process, to evaluate compliance with performance expectations defined in this specification, in the Supplier Quality Plan and in any other project scope of work specifications or contracts.
- c) These audits may include but are not limited to any quality or other project functional area audits, assessments, verification of compliance reviews, surveillance, inspections or witnessing of scope of work deliverables provided by the Supplier and its Sub-Contractors.
- d) Audits shall be carried out by independent personnel familiar with the work being audited.
- e) Eskom has the right of access to any audit reports performed by the Supplier as reflected in the audit schedule.
- f) Records shall be kept of all audits (including internal, supplier or sub-contractor audits), and shall be made available to Eskom on request.

#### **9.2.9.3 NON-CONFORMANCES**

- a) Description of, or procedure for, control of non-conforming product.
- b) The process or procedure shall make provision for non-conformances raised by customers and Eskom to be taken up into the system, formally investigated, corrective action taken, and closed-out.
- c) The process or procedure shall make provision for records to be kept of all non-conformances. Eskom shall be notified when non-conformances are identified, and the records shall be made available to Eskom on request.

**PUBLIC DOMAIN**

### **9.2.10 CORRECTIVE AND PREVENTIVE ACTION**

Description of, or procedure for, corrective and preventative action, including how corrective and preventative action are raised, evaluated, implemented and closed-out.

## **9.3 PROJECT QUALITY PLAN**

**9.3.1** The supplier shall submit a project quality plan that addresses all the elements of the QMS for this contract.

**9.3.2** The project quality plan shall include all the quality management aspects as listed under the QMS above, and in addition, address the project specific elements such as quality objectives, project stages, roles and responsibilities, control of documents and data, control of records, resources (material, human resources, infrastructure and work environment as applicable), requirements, stakeholder communication, design and development (if applicable), procurement, production and service provision, identification and traceability, customer property, preservation, control of non-conforming product, monitoring and measurement, acceptance criteria and audits.

**9.3.3** The project quality plan shall contain a list of all applicable codes, standards, specifications and regulations.

**9.3.4** The project quality plan shall indicate details of the type of SWH to be supplied and the controls to ensure that the SWHs comply with Eskom specifications.

**9.3.5** The project quality plan shall include scheduling of activities.

**9.3.6** The project quality plan shall contain a schedule of anticipated internal audits covering all functional areas of the supplier business and related quality performance reviews.

**9.3.7** Once the contract has been awarded to the successful supplier, the project quality plan shall be updated and submitted to Eskom for acceptance prior to implementation of the project.

**9.3.8** The supplier shall implement the project quality plans (PQP) during project execution.

**9.3.9** An electronic copy of a sample project quality plan is available as part of the tender documentation

## **9.4 INSPECTION AND TEST PLAN**

**9.4.1** The supplier shall submit an inspection and test plan (ITP) for evaluation, and shall implement the ITP during the execution of the project

**9.4.2** The ITP shall include at least the following:

- a) Eskom contract number and title, Supplier order number;
- b) ITP unique number;
- c) Identification of the area of works/contract;
- d) Description of the work with components, item number and activity date;
- e) A list of the sequence of operations, including inspection and tests;

**PUBLIC DOMAIN**

- f) The dates on which the activities are scheduled to start and end;
- g) The identification of the specification, drawing number, or procedure for each operation as applicable;
- h) The acceptance criteria with reference to the technical specification, in-house, national, or international standard, with the relevant clause number for each operation;
- i) The inspection and test activities that the Supplier has nominated for his witness and hold points;
- j) Provision for the inclusion of witness and hold points required by Eskom and/or the third party authority/agency;
- k) Provision for sign-off by all relevant parties on all inspections, tests, witness and hold points;

**9.4.3** Records shall be kept of all inspections, tests, and witness reports.

**9.4.4** Where thirds party inspections are required, these shall be included in the ITP. Eskom shall appoint or accept the appointment of the approved inspection authority (AIA).

**9.4.5** The ITP shall be reviewed by Eskom quality engineering department, and shall be utilised by Eskom quality to allocate resources for the inspection, test and witnesses.

**9.4.6** Once the contract has been awarded to the successful supplier, the ITP shall be updated and submitted to Eskom for acceptance prior to implementation of the project.

**9.4.7** The supplier shall implement the ITP during project execution.

**9.4.8** Where Eskom inspection, test, witness and hold points are due on the ITP, the supplier shall issue an inspection and test notification (ITN) to Eskom at least 7 days in advance of the scheduled date, to allow Eskom to mobilize its resources. The ITN shall be sent to the Eskom quality hub via [qualityhub@eskom.co.za](mailto:qualityhub@eskom.co.za), the Eskom project manager and copied to the nominated Eskom PQA resource.

**9.4.9** An electronic copy of a sample inspection and test plan is available on request.

**9.4.10** An electronic copy of a sample inspection and test notification is available on request.

## **10. FINANCIAL REQUIREMENTS**

The cost of the supply of products and services as specified in this tender document, shall be done using the Pricing Schedule templates provided as part of the RFP

## **11. COMMERCIAL REQUIREMENTS**

### **11.1 GUARANTEES**

- a) A provision of 5 years warrantee is required for the SWH systems. The communication channel for the claiming of the warrantee shall be clearly defined, and shall be stated in the tender submission documents to Eskom. On award of the tender, the communication lines shall be clearly communicated to the customer, including by displaying the Supplier name and contact detail clearly on the equipment.

**PUBLIC DOMAIN**

- b) The collectors and cylinders shall be guaranteed from the date of takeover for a period of 5 years thereafter. A copy of the manufacturer’s guarantee shall be supplied to the customer by the Installer.
- c) Insurance may be required for the warrantee period. Replacement parts need to be freely available at various independent outlets, and this must be communicated to the customer and to Eskom in the tender submission.
- d) If, within the first six months of the guarantee period, 20 % or more of any class of installed equipment fails, Eskom may, at their sole discretion, have the right to demand the replacement of all that class of component or materials for the entire set of unit installations awarded to the bidder at the cost of the Supplier.
- e) In cases where systems fail and customers wish for the system to be removed prior to the 5 year period, the system cost shall be re-paid in full to Eskom.

**12. REVISIONS**

<b>Date</b>	<b>Rev.</b>	<b>Compiler</b>	<b>Remarks</b>
May 2012	0	B Mabuzane	First issue to specify tender requirements
Aug 2012	1	B Mabuzane	Incorporation of input from DoE
Dec 2012	2	B Mabuzane	Revision of technical requirements and incorporating input from SHE, Quality and procurement
Mar 2013	3	B Mabuzane	Incorporation of comments from Enquiry Stream and NEC Contracts specialists.
April 2013	4	A Muller	Updated based on comments from Tender Clarification sessions

**13. DEVELOPMENT TEAM**

The following people were involved in the development of this document:

- Belinda Mabuzane
- Raj Pandaram
- Anneleen Müller
- Johann Putter
- Francois Van Geems
- Florence Poee
- Khanyiso Zihlangu
- Xolile Mabusela

**PUBLIC DOMAIN**