|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DOCUMENT NO.** | | | **QM-RD** | |
| **EDITION** | **2018** | **REV.** | | **0** |
| CONTROLLED COPY | | | | |
| UNCONTROLLED COPY | | | | |
| COPY NO. | | | | |

**QUALITY CONTROL MANUAL**

**Submitted by:**  **Date: 2018-10-27**

**Quality Manager**

**Approved by:**   **Date: 2018-10-27**

**ASME Designee**



**MERSEN Xianda Shanghai Co., Ltd.**

ADDRESS:

NO. 289, Shen Zhou Road, Feng Xian District

Shanghai 201411, P. R. China

TEL: +86-21-5752 7777\*5135

FAX: +86-21-5752 2398

POST CODE: 201411

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **LOG OF REVISION OF MANUAL** | | | | |
| **Date** | **Section** | **Description** | **Approved** | **Accepted** |
| 2014-7-15 | / | First issue | WJJ | ATS |
| 2018-3-27 | All | Remove content not related to the company and update the OC. |  |  |
|  |  |  |  |  |

**SECTION A: TABLE OF CONTENTS**

SECTION REV. DATE:

Cover Sheet 0 2018-3-27

Revision Descriptions 0 2018-3-27

Table of Contents A 0 2018-3-27

Statement of Authority and Responsibility B 0 2018-3-27

Manual Control 1 0 2018-3-27

Organizational Chart 2 0 2018-3-27

Description of Responsibilities 3 0 2018-3-27

Drawings and Design Control 4 0 2018-3-27

Material Control 5 0 2018-3-27

Examination and Inspection Program 6 0 2018-3-27

Correction of Nonconformities 7 0 2018-3-27

Calibration of Measurement and Test Equipment 8 0 2018-3-27

Stampings and Reports; Records Retention 9 0 2018-3-27

List of Related Work Instructions 10 0 2018-3-27

Exhibit Index Table of Contents 11 0 2018-3-27

**SECTION B: STATEMENT OF RESPONSIBILITY AND AUTHORITY**

The General Management of Mersen Xianda Shanghai Co., Ltd. has established this Quality Control System for the fabrication of graphite rupture disc pressure relief devices in accordance with the requirement of ASME Boiler and Pressure Vessel Code Section VIII, Division 1.

The ASME Code hereafter referred to as the Code, along with this Quality Control System, are to be adhered to in all shop fabrication activities. Employees carrying out Quality Control functions have definite responsibilities to meet all Code requirement and manual requirement. They also have the authority to identify and report Quality Control problems to The Quality Manager.

The Quality Manager has the responsibility, authority and organizational freedom to identify quality control problems, and to initiate, recommend and provide solutions. The Quality Manager has the authority to stop work that does not comply with this Quality Control Manual or the Code.

Whenever revisions are made to the Quality Control Manual, the Quality Manager shall be responsible for incorporating the changes and submitting them for approval of the General Manager and acceptance by the ASME Designee (National Board) before being implemented.

The General Management of Mersen Xianda Shanghai Co., Ltd. in assigning this responsibility to the Quality Manager. The General Manager is cognizant that he, as chief division officer, retains ultimate responsibility for Code compliance. If at any time conflicts occur between departments, they will be resolved by the General Manager without compromising the Code or this Quality Control Manual.

General Manager

**2018-3-27**

Date

**SECTION 1: MANUAL CONTROL**

1.0 MANUAL CONTROL

(a) This manual and its revisions shall be controlled by the Quality Manager and submitted for review and acceptance by the National Board prior to implementation.

(b) The Quality Manager maintains the Manual on the system network. The manual is available to all employees in a read only format. Access to make changes is restricted to the Quality Manager or his designee. A printed control copy including samples of exhibits shall be available in the quality office for review.

(c) The Quality Manager shall review the Code editions at the time of issue for possible changes that may require revisions to this Manual. If revisions are necessary, they shall be incorporated within 6 months from issue date. A record of this review shall be made on the CODE EDITION REVIEW FORM (Exhibit I) along with notation of the changes that will affect the Mersen Xianda Shanghai Co., Ltd. quality system.

(d) Revisions will be by complete sections with the revised level noted on the Table of Contents page, except for the Exhibit Index, which will be by page with the revision level noted on the Exhibit Index Table of Contents page. Colored in Red will mark the latest revisions. At the discretion of the Quality Manager, the manual edition level may be advanced, at which time all revision levels will revert to “0”. Uncontrolled copies of this manual may be issued to owners, clients, etc. and will be current at the time of issue but will not be updated to include subsequent revisions or editions. Uncontrolled copies shall not be issued to any Mersen employee.

(f) Uncontrolled copies of this manual will be marked “Uncontrolled Copy” on the cover sheet.

(g) A “controlled” copy of this manual shall be furnished to the ASME Designated Organization. The ASME Designee shall be provided access to all product-related documentation as necessary for him/her to conduct review duties. Mersen shall demonstrate, to the satisfaction of the ASME Designee, its manufacturing, production, and testing facilities and quality control procedures in accordance, as applicable with ASME Section VIII, Division 1.

**SECTION 2 ORGANIZATION CHART**



**SECTION 3 DESCRIPTION OF RESPONSIBILITIES**

3.0 DESCRIPTION OF RESPONSIBILITIES

3.1 GENERAL MANAGER

(a) Finance.

(b) General Administration.

(c) Ultimate responsibility for compliance with ASME Code.

3.2 QUALITY MANAGER

(a) Enforces and maintains the Quality Control System and currency of the manual.

(b) Maintains control of the Master Copy printout of the Quality Control Manual.

(c) Monitors vendor performance and accuracy regarding materials identification and documentation,

(d) Verifies performance of materials control receiving inspections. Monitors material handling, storage, and identification prior to and during fabrication.

(e) Monitors activities of the Rupture Disc Operators and assists in resolving questionable quality issues.

(f) Directs periodic and unannounced audits of the Quality Control System.

3.3 BUYER

(a) Prepares Requisition forms for materials to be purchased.

(b) Prepares and issues printed Purchase Order Attachment from Requisitions and distributes copies of the Purchase Order Attachment.

(c) May receive Material Certifications from vendors and forward copies to The Quality Manager

3.4 WAREHOUSE KEEPER

1. Control the receiving, handling, storage, identification, and distribution of materials prior to releasing for fabrication.

(b) May prepare requisitions for supplies and submit to Buyer, as necessary.

3.5 MANAGER OF PURCHASE DEPARTMENT

(a) Supervises all phases of the purchases.

3.6 SALESMAN

(a) Provides sales and service support to the customers.

(b) Prepares Work Order (W.O.) forms based on orders received from the customers and maintains production schedule.

(c) Supervises computer order entry process.

(d) Expedites shipments and maintains inventory records.

(e) Initiates order entry and performs customer service functions.

(f) Reviews customer-supplied documents for Code Requirements

3.7 MANUFACTURING MANAGER

1. Supervises all phases of the shop fabrication.

3.8 CALIBRATION SUPERVISOR

(a) Monitors calibration of measurement and test equipment and maintains the logbook on ASME.

3.9 CERTIFIED INDIVIDUAL

(a) The Certified Individual that is certified by the National Board of Boiler and Pressure Vessel Inspectors shall be an employee of Mersen and appointed by The Quality Manager.

(b) The Certified Individual shall have knowledge of the Code of Construction and the Manufacturers Quality Control Program.

(c) Certification Records and evidence of training for the C.I. if available, shall be maintained by The Quality Manager and updated on a yearly basis.

(d) Makes revisions to the quality system and electronic records as necessary.

(e) Has custody and control of the ASME Certification Mark with “UD” Designator and the National Board “NB” marking.

(f) Verifies that each item to which the Certification Mark with “UD” Designator is applied conforms to all applicable requirements of Section VIII Div.1 and has a current capacity certification for the Certification Mark with “UD” Designator.

(g) Reviews documentation for every lot of items to be stamped, to ensure that all requirements of Section VIII Div.1 have been completed. Documentation review will include the W.O. and UD-1 form.

(h) Prior to release of control, the Certified Individual verifies that he/she has signed the appropriate Certificate of Compliance/Conformance form (UD-1).

(i) Verifies Nameplate stamping accuracy-this responsibility shall not be delegated.

3.10 Process Engineer

(a) Prepares and issues all the technical documents prior to manufacturing.

(b) Prepare requisitions for supplies and submit to Buyer

**SECTION 4 DRAWINGS AND DESIGN CONTROL**

4.0 DRAWINGS AND DESIGN CONTROL

(a) Design drawings and calculations are produced for Mersen under the Technical Department. Manager’s supervision.

(b) Product design shall be developed to meet customer specifications, based on sales and engineering input. Design requirements may be for new or significantly redesigned standard products, or from a customer specification. The Salesman is responsible for originating, documenting, and providing design input requirements to the Technical Manager for both new products and customer specified products. All designs and design changes shall be subject to the inspection and certification criteria required by the Code.

(c) Only approved drawings shall be available to the manufacturing staff for use in fabricating product. Drawings are generated by the Technical Manager and made available to the Rupture Disc Operators in the fabrication shop. When the customer order calls for specialty items such as the bars, coating and/or high temp. assemblies, a copy of the appropriate drawing is attached to the W.O. by the Salesman for use in fabrication. The W.O. and the drawing accompany the parts throughout the fabrication process and are referred to during all phases of testing and inspection. Should there be a change in any standard drawings, The Technical Manager is responsible for removing the obsolete drawing from circulation and replacing it with the revised drawing. The RD Team Leader will remove obsolete drawings from the office and floor shop drawing files.

(d) When revisions are made to drawings the specifications are rechecked by an Process Engineer, initialed and dated. Revisions are noted in the Drawing Title Box and Revision Record Box on drawings.

(e) The certified flow resistance Kr factor shall be calculated by the Technical Manager in accordance with the ASME testing requirements defined in Section VIII, Div. 1, UG-131. This factor is identified on approved drawings and shall be stamped on the appropriate Nameplate (see Exhibit H) and attached to the discs.

(f) Engineering Design changes are also controlled by Procedure RP-P/5 Rules for Design Control.

**SECTION 05 MATERIAL CONTROL**

5.0 MATERIAL CONTROL

(a) Mersen rupture discs are fabricated from 2890 graphite or XBS graphite. Inventory levels of raw graphite are monitored by the Warehouse Keeper to maintain requisite levels. When necessary, the Process Engineer places a Purchase Order Requisition (Exhibit B) with the vendor, and Purchase Orders (Exhibit C) are keyed into the computer system from the information on the Purchase Order Requisition.

(b) All Purchase Order Attachments must be approved and signed by the Purchase Manager. All completed Purchase Orders are maintained in a completed order file.

(c) Material control methods for each material are as follows:

(c-1) 2890 Graphite Mersen uses isostatic graphite for fabricating graphite rupture discs. Raw graphite is purchased from suppliers and received in various sections and lengths. When a Work Order is issued to the shop, the Rupture Disc Team Leader ensures that the appropriate grade material is pulled from inventory and entered into production for order fabrication. Prior to the impregnation process, which makes the graphite impervious, lot quantities are determined and a material lot control number is engraved. A material controlled lot must be processed within the same impregnation cycles. In the event that a lot must be split between different impregnation cycles, additional material lot control numbers are established and parts are engraved accordingly. Documentation concerning raw material quantities and availability is available through inventory and purchasing records.

(d) Specific material to be used in disc manufacture is indicated on the W.O. form issued by the Salesman. If substitution of material becomes necessary, either by availability or customer request, all related W.O.’s and drawings must be revised and approved by the Technical Manager.

(e) After parts are machined, the W.O. number and the lot number are scribed on the disc to ensure identification.

(h) A procedure and instruction exist for handling materials that are found to be nonconforming at receiving inspection in accordance with Section 7 of this manual (see Procedure RD-P/4 NCR Procedure).

(i) Markings shall be accurately transferred to a location where they will be clearly visible.

**SECTION 6 EXAMINATION AND INSPECTION PROGRAM**

6.0 EXAMINATION AND INSPECTION PROGRAM

(a) A receiving inspection of both raw graphite and Graphilor N blanks is performed by the Rupture Disc Team Leader when materials are received to ensure that the material conforms to Purchase Order Attachment specifications.

(b) Rupture discs are machined and tested in accordance with instructions and procedures outlined on the W.O., the engineered drawing, and documented procedures. Prior to machining an entire lot, 2 or more sample discs are destructive tested in the pressure testing pipe rig or testing stand to assure that the burst pressure of the disc membrane is within parameters indicated on the W.O. Either the Rupture Disc Team Leader or the Rupture Disc Operator conducts this test. Results of the test are recorded on the W.O. and used to control manufacture of the balance of the lot.

(c) Additional testing shall include:

(c-1) upon completion of machining, all discs 5 psi and up are subjected to pressure test to 85% of designed burst pressure. This ensures that discs lower than the accepted breakpoint are eliminated.

(c-2) rupture disc fabrication does not require welding, heat treatment or Code NDE.

**SECTION 7 CORRECTION OF NONCONFORMITIES**

7.0 CORRECTION OF NONCONFORMITIES

7.1 IDENTIFICATION OF NONCONFORMITIES

(a) A nonconformity is any condition in material or fabrication that does not meet the requirements of the Code, material specifications, design specifications, manufacturing documents, or the requirements of this Quality Control Manual.

(b) It is the duty of all Mersen employees to report nonconformities to their supervisor who shall notify the Q. A. Manager. The Quality Manager, working with the Rupture Disc Team Leader and the The Manager of Production department, verifies the nonconforming condition and segregates the material to prevent additional fabrication or use until disposition can be made. The Nonconformity Report (NCR) (Exhibit E) shall be prepared according to RD-P/4.

7.2 DISPOSITION OF NONCONFORMITIES

(a) USE-AS-IS: When the disposition is “use-as-is”, the The Quality Manager may consult with and obtain the approval of the Manager of Production Department as necessary. Any required revisions to drawings or procurement documents will be done as described in this Manual.

\*\*\*\*\*NOTE: When “use-as-is” disposition is made, it is imperative that the material not violate the requirements of the Code

(b) REPAIR: Repair of surface defects in material may be done using standard or special procedure.

(c) The Quality Manager shall reinspect items or materials as dispositioned above. When satisfied that the nonconformity has been addressed or corrected, The Quality Manager signs the NCR, and permits the item or material to return to its proper sequence of fabrication. Completed NCRs are assigned a control number and filed in the Quality Office.

**SECTION 8 CALIBRATION OF MEASUREMENT AND TESTING EQUIPMENT**

8.0 CALIBRATION OF MEASUREMENT AND TESTING EQUIPMENT

1. The Calibration Supervisor is responsible for the calibration of all measurement & test equipment, which shall be identified for control purposes by assigned control numbers that are listed on the Master Calibration List (Exhibit G).

(b) Measurement & test equipment is calibrated semi-annually using an approved outside calibration source or by Calibration Supervisor. Calibration standards are calibrated every five years by an approved outside calibration source.

(c) A Calibration Sticker (Exhibit F) is affixed to each calibrated gauge or piece of electronic equipment indicating current calibration date, identity of the company provides the calibration service, and the re-calibration due date. Calipers and micrometers are assigned identifying marks and calibration information is documented on the Master Calibration List. The Calibration Supervisor documents on the Master Calibration List the pertinent data for each measuring device showing the identifying number, description, location, last calibration, status and date of the next calibration, and “as found/as calibrated” information. When calibration is performed by an external accredited laboratory, documentation provided by them shall include the identifying numbers of the equipment used for purposes of traceability to the lab, with “as found/as calibrated” information.

(d) When equipment is found to be out of calibration, it is removed from the work area for recalibration or replacement. Any product that has been tested with suspect equipment shall be re-tested to confirm fitness for use. Should any questionable product been shipped, Mersen will contact the customer(s) and request return of the product for additional testing.

(e) Calibration records are reviewed, approved, and stored by the Calibration Supervisor.

**SECTION 9 STAMPING AND REPORTS**

9.0 STAMPING AND REPORTS

(a) Mersen Quality Control Manual - Electronic records are maintained on the system network. Backups are performed periodically by the Systems Manager and stored off site. The Quality Control Manual is made available to all personnel in a read only file. Only the Quality Manager has authorized access to make changes to the Network system file.

(b) Inspection and Test Reports, WO’s - Inspection and test results are documented on the W.O. which is returned to the Salesman at end of production. These documents are stored in a file cabinet accessible to the Salesman, the Quality Manager. Work Orders are indexed by number assigned from the logbook maintained by the Salesman. The W.O. number is also cross-indexed to the shop order number for customer identification.

(c) 2890 Receiving Report - This report is completed by the Rupture Disc Team Leader as vendor supplied blanks are removed from crates and stored on stock shelves. When the form has been completed, it is returned to the Warehouse Keeper, who enters the information into the logbook. The log book provides cross index information on individual lot numbers received and is kept in the Warehouse. The form is then filed in the file cabinet accessible to the Warehouse Keeper, The Quality Manager.

(d) Calibration data - Calibration data is recorded by the Calibration Supervisor. These records describe calibration information and document calibration frequency. Electronic data records are maintained on the network and are accessible only to the The Quality Manager. Hard copy record of the most current calibration is available in the Calibration Supervisor office for review.

(e) Nameplate (Exhibit H) - Nameplates will provide complete traceable information for the disc and must be mounted to each disc individually. Information on the nameplates shall include:

- Company name or identifying trademark and disc material

- Series type identification

- lot number (traceable to the year of manufacture)

- disc size

- marked burst pressure in psi/Mpa.

- specified disc temperature in F/C.

- minimum net flow area in sq. in/sq. mm.

- certified flow resistance Kr.

- ASME Symbol and NB Symbol

- flow direction indicator

(f) Records, including the UD-1 form, shall be retained for a period of (5) years

**SECTION 10 LIST OF RELATED INSTRUCTIONS AND PROCEDURES**

LIST OF RELATED INSTRUCTIONS AND PROCEDURES

RD-P/1 -- Calibration of RD Measuring Equipment

RD-P/2 -- Control of Monitoring and Measuring Equipment

RD-P/3 -- Identification and Traceability

RD-P/4 -- NCR Procedure

RD-P/5 – Rules for Design Control

RD-P/6 – Material Receiving and Inspection

RD-WI/1 -- Rupture Disc Manufacturing

RD-WI/2 -- Manufacturing and Installation of Rupture Disc bars and

RD-WI/3 -- Application of Rupture Disc coating

RD-WI/5 -- Rupture Disc Repair

RD-WI/6 -- Assembly & Preparation of Rupture Discs for Shipping

RD-WI/7 -- Packaging of Rupture Discs and Shipment

RD-WI/8 -- Visual Inspection of Rupture Discs

RD-WI/9 -- Operating the Rupture Disc Test Stand

RD-WI/10 -- Cement Mixing Instructions

RD-WI/11 -- Performing Pressure Gauge Calibration

RD-WI/12 -- Performing Calipers Calibrations

RD-WI/13 – XBS Resin Impregnation Procedure

**SECTION 11 EXHIBIT INDEX TABLE OF CONTENTS**

SECTION 11

EXHIBIT INDEX TABLE OF CONTENTS

EXHIBITS REV.

A Work Order 0

B Purchase Order Requisition 0

C Purchase Order 0

D Receiving Report 0

E Nonconformity Report 0

F Calibration Sticker (In House) 0

G Master Calibration List 0

H Nameplate 0

I Log of Code Review 0

J UD-1 Form 0

K Certified Individual Appointment 0

L Record 0

FIRST ED., REV. 0

VERIFIED ON: 2018-3-27