

#139692

ERL MAINTENANCE SUPPORT SDN BHD

(Company No. 498574-T)



Effective Railway Operations; Reliable System Maintenance

ROLLING STOCK DEPARTMENT

IN-HOUSE TECHNICAL INSTRUCTION


CALIBRATION & VERIFICATION MANAGEMENT

Ref. No. R00.OMR.M90000.QP.1001.B

Rolling Stock Department

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Release

Released:	Jayarajah	RSX Manager	18/7/18	
Checked:	Norazman	RST HoD	18/07/18	
Checked:	Salehhudin	RST QEMR	18/07/18	
Author:	Siti Masitah	RST Supervisor	18/7/18	
	Name	Dept./Position	Date	Signature

Amendments or additions to this procedure must be indicated with a vertical black line in the adjacent left margin.

Change Record and Configuration Control

B	22.05.18	Introducing column 'Planning of changes reference for revision'. Update on section 4 and 5.	Siti Masitah
A	11.04.17	New	Mohamad
Revision	Date	Modification	Name

Planning Of Changes Reference For Revision: R00.OMR.M90000.QP.1001.B				
Issues To Consider	Checked (Please mark X)			Remarks
1) Are there any negative impact?	YES		NO	X
2) Will the integrity of QEMS be affected?	YES		NO	X
3) Resources available?	YES	X	NO	
4) Allocation or relocation of responsibilities and authorities required?	YES		NO	X

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1 Purpose

This document is to outline the calibration and verification processes of measuring tools and equipment within RST. Calibration and verification are essential to ensure that the tools and equipment are in good working condition and provide accurate measurement.

The calibration and verification processes also shall be compliance with the requirement of ISO 9001 and ISO 14001.

2 Scope, Distribution & Access

This document is applicable to all RST personal and could be viewed and retrieved via EDMS and RST Portal [http://express50/E-MAS_Portal/RST.html]. The hardcopy of this procedure is available in RST foreman room for reference. The full access for editing this document is only granted to EMS RST Supervisor.

3 Abbreviation and Definitions

Term	Definition
HOD	Head Of Department
MMT	Material Management Department
PRC	Procurement Department
RST	Rolling Stock Department
QMD	Quality, Environmental & Documentation Department
Calibration	Operation that establishes the relation, obtained by reference to one or more measurement standards, that exists under specified conditions, between the indication of a measuring system and the measurement result that would be obtained using the measuring system
Verification	Confirmation through examination of a given item and provision of objective evidence that it fulfils specified requirements
Reference Standard	Material or substance one or more of whose property values are sufficiently homogeneous and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials.
Traceability	The linking of measurement standards and/or measuring instruments to relevant national or international standards through an unbroken chain of comparisons. Typically, reference standard is traceable to National Metrological Lab (NML) -SIRIM.

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4 Procedure

Calibration determination depends on the usage and the work requirements. The measuring tool or equipment are very vital to operation and safety. Thus, they need to be calibrated or verified on regular basis. The interval for each calibration or verification shall be based on the usage frequency of the measuring tool or equipment. Typically, the critical tool or equipment are calibrated on yearly basis.

Users have to determine the usage parameters of the measuring instruments based on the work requirements. The calibration or verification shall cover all the usage parameter.

4.1 RST Master List of Control Tools/Equipment

All the tools and equipment that require for calibration or verification, shall be recorded in RST Master List of Control Tools, [R00.OMR.M12990.CI.0003.*]. The calibration coordinator has to ensure all the tools and equipment are listed and all the details required are updated as follows.

- a. Equipment Description
- b. Manufacturer
- c. Model
- d. Serial Number
- e. Tolerance
- f. Calibration or Verification Parameters
- g. Calibration or Verification Interval
- h. Stored Location
- i. Calibration or Verification Due Date

4.2 RST Calibration Monitoring Record

To ease monitoring all the tools and equipment calibration due date and to keep the history calibration record, a RST Calibration Monitoring Record has been created in MS Excel file in the location as shown below.

<\\Express66\rst\RST Maintenance Monitoring & Records\MGT Monitoring & Records\RST Calibration Monitoring Record\RST Calibration Monitoring Record.XLS>

The cell of calibration due date for each tool and equipment will automatically change their colour when the number of days before due date counted is fall under the parameter that has been set, as shown in Picture 1 below. This to alert the calibration coordinator to prepare the calibration requisition before overdue date. The calibration coordinator is also responsible to update and monitor this record regularly.

40	Days before due
30	Days before due
	Over due

Picture 1: Parameter of number of days before due date set to change the colour.

Note: The number of days before due date can be changed according to the current requirement and the calibration due date for each tool or equipment will follow accordingly.

An asterisk () is used to refer to the latest version.

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4.3 Requisition for Calibration

The step for requisition for calibration is as follows;

- Create ZSTC work order for every single tool/equipment, refer to SAP - Plant Maintenance End User Process Guide Procedure, [G00.OMQ.M11070.CA.0001.*]
- Fill in the Calibration / Verification Requisition Form, [G00.OMN.M11411.DQ.0001.*]
- Fill in the ERL Purchase Requisition Form, [G00.OMU.M10540.CD.1010.*]
- Submit the completed forms (b and c) to MMA and PRC for purchase order approval, refer to Purchasing Procedure, [G00.OMU.M10540.CD.0008.*]
- Upon the purchase order approved, submit the tool or equipment to MMA for external calibration or call calibration lab for on site calibration.

4.4 Requisition for Verification

The step for requisition for calibration is as follows;

- Create ZSTC work order for every single tool/equipment, refer to SAP - Plant Maintenance End User Process Guide Procedure, [G00.OMQ.M11070.CA.0001.*]
- Fill in the Calibration / Verification Requisition Form, [G00.OMN.M11411.DQ.0001.*]
- Submit the completed form (b) and tool or equipment to MMA

4.5 Verify after Calibration or Verification

Upon receiving the tool or equipment form calibration or verification, the calibration coordinator shall check and verify the tool or equipment as briefed as follow.

4.5.1 Visual or Functional Check

To carry out visual inspection or functional check, if necessary. This is to ensure the tool or equipment received after calibration is in good condition.

Note: The tool or equipment may has a possibility to defect during transportation period.

The calibration coordinator also to ensure a valid calibration or verification sticker pasted on the suitable part of the tool or equipment. The details printed on the sticker must correct and similar with the certificate, i.e serial number, calibration date and calibration due date.



Picture 1: Sample of calibration sticker

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4.5.2 Calibration Certificate Verification

The calibration coordinator shall verify the results of calibration or verification upon receiving the tool or equipment and certificate. The important items to verify are as follow;

- a. Ensure all the equipment details printed are correct, i.e description, model, and serial number.
- b. Ensure the calibration date and calibration due date printed is correct as per requested.
- c. Ensure the Reference Standard(s) used is/are valid and traceable to any national standard.
- d. Ensure the Calibration Results and Measurement Uncertainty are within our tolerance requirement.

The certificates must be stamped and signed on the front page that includes confirmation on pass or fail remarks. The simple guideline of calibration certificate verification is as Attachment 1 (Certificate No: SM17583432).

The original copy of calibration or verification certificate shall be submitted to QMD for profiling and safekeeping.

4.5.3 Defective or Out of Tolerance

Any tool or equipment that defective or out of tolerance after calibration or verification, the HoD shall decide whether to;

1. Repair – inform PRC, repair PR shall be raised and return tool to MMT.
2. Scrap – return tool to MMT, the justification for scrap shall be written in the scrap form and keep the copy of scrap form as a record.
3. Continue using them – HOD has to write a memo with a relevant justification.

The repair and scrap tool or equipment shall not be used for maintenance works. A relevant tag shall be attached to the tool or equipment to avoid from used by others.

4.6 Update Calibration Record

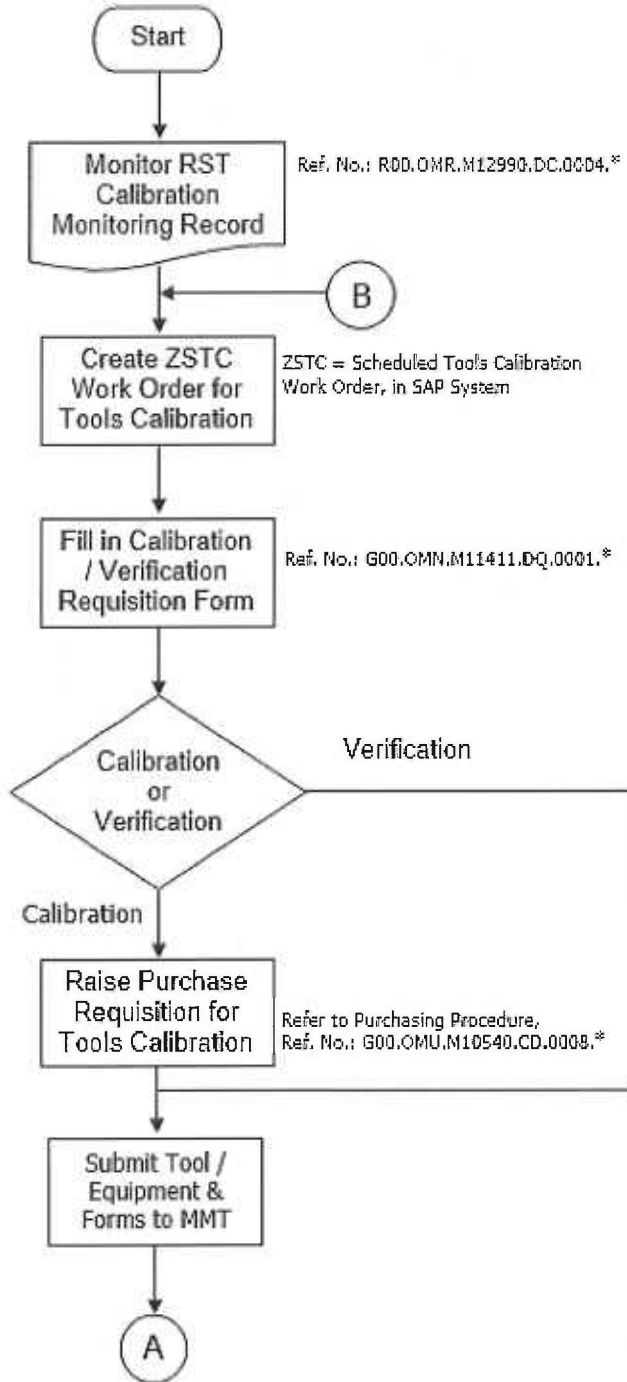
The calibration records as mentioned in Section 4.1 and 4.2 shall be updated accordingly upon completed the calibration or verification process by calibration coordinator.

The created ZSTC Work Order also shall be closed accordingly, refer to SAP - Plant Maintenance End User Process Guide Procedure, [G00.OMQ.M11070.CA.0001.*].

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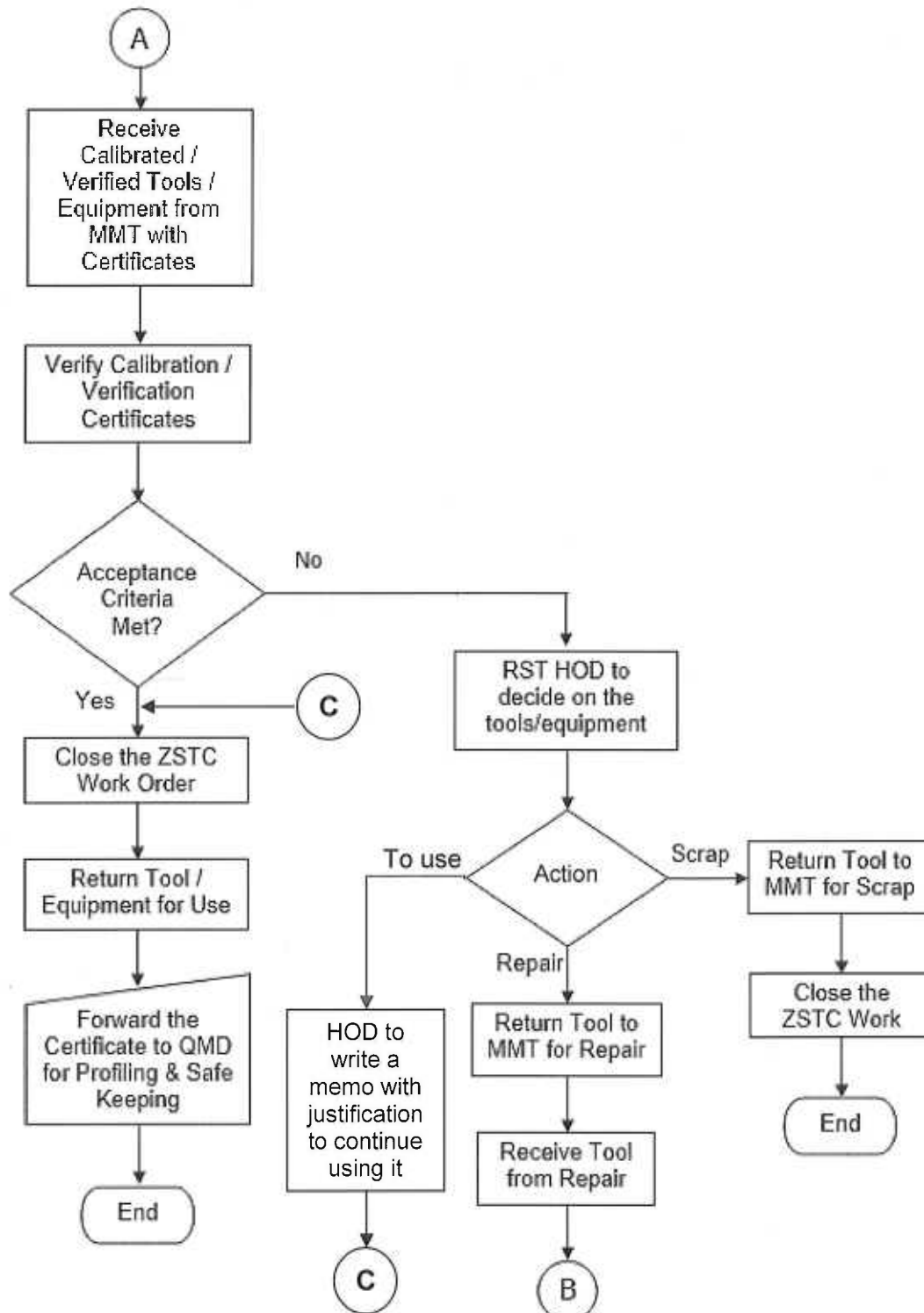
5 Process Flow Chart



*Remarks: This is the calibration coordinator flow chart.

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*Remarks: This is the calibration coordinator flow chart.



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SENDI MAHIR SDN. BHD. (333138-T)
GST No: 001894494208

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CERTIFICATE OF CALIBRATION

Certificate No. : SM17583432

Date of Issue : 19 Apr 2017

Issued By : Sendi Mahir Sdn Bhd

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Customer : EXPRESS RAIL LINK SDN BHD
KOMPLEKS REL UDARA
BANDAR BARU SALAK TINGGI
43900 SEPANG SELANGOR

Instrument : Torque Wrench

Calibration Date : 19 Apr 2017

Manufacturer : Facom

Recalibration Date : 19 Apr 2018

Model/Type : S.306-100D

Specified By Customer

Serial No : S074017

Remark : The user should be aware that any numbers of factors may cause this instrument to drift out of calibration before the specified calibration interval has expired.

Capacity : Max : 100 N.m

Resolution : -

Calibration Environment Condition:

Condition Upon Receiving : Good in Physical Condition

Temperature : 21.5 to 21.8 °C

Relative Humidity : 52 to 54 %RH

Condition Upon Returning : Calibrated and Tested Serviceable.

Calibration Method : In-house procedure ICPF3H

Calibration Venue : This Instrument has been calibrated at Sendi Mahir Sdn Bhd

Calibration Result : The result as following page(s). The expanded uncertainties are based on an estimated confidence probability of approximately at 95% and have a coverage factor of k=2 unless stated otherwise.

Reference Standard(s) Used :

Reference Standard Name	Serial No	Calibration Due Date	Traceable To
TORQUE TESTER	M003C	01 Jun 2017	NPL(UK)

Calibrated By:

Mohd. Alias



L.H. Seah

This certificate is issued in accordance with the conditions of accreditation granted by the SAMM which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realised at the corresponding national standards laboratory. The results of calibration performed by Sendi Mahir Sdn. Bhd. apply to the particular equipment at the time of its test. They do not indicate or imply that Sendi Mahir Sdn. Bhd. approves, recommends or endorses the manufacturers or suppliers or users of such equipment that Sendi Mahir Sdn. Bhd. in any way guarantees the equipment's performance after calibration. Test/calibrations marked "Not SAMM Accredited" in this report/certificate are not included in the SAMM Accreditation Schedule of our laboratory. Opinions and interpretations expressed herein are outside the scope of SAMM accreditation. Copyright of this certificate is owned by the issuing laboratory and may not be reproduced other than in full except with the prior written approval of the Head of the issuing laboratory.



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CERTIFICATE OF CALIBRATION

Certificate No : SM17583432

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Technical Information

Direction : Clockwise

Manufacturer Specification : N/A

Calibration Results :

All Unit In : N.m

Accuracy Test

Setting Torque	Measured Value	
	Before Adjustment	After Adjustment
20	20.0	N/A
40	40.4	N/A
60	60.4	N/A
80	80.7	N/A
100	100.9	N/A

Measurement Uncertainty : \pm 0.1 N.m

Note 1: Interpolation = Reading in between 2 test point may be derive by interpolate and plot a straight line graph where Applied Torque(x-axis) Vs.Measured Value(y-axis).

Note 2: Uncertainty = Parameter, associated with the result of measurement, that characterises the dispersion of the value that reasonably be attributed to the measurand.

Note 3: Correction can be ignore if smaller than user specification, unless otherwise user shall apply correction to derive true value.

Note 4: If no adjustment done refer to 'Measured value before adjustment'. If adjustment was done refer to 'Measured value after adjustment'.

Note 5: Not Available.