ERL MAINTENANCE SUPPORT SDN BHD

Co. Reg. No. 199901023674 (498574-T)

E-MAS

Effective Railway Operations; Reliable System Maintenance

SYSTEMS (SYS) DEPARTMENT

SYS MAINTENANCE MANAGEMENT PROCEDURE

Ref. No. E00.OME.M15000.BT.1010.A

Release

Released:	Ham Mow Wai	Maintenance	18.2.21	
Checked:	Sukhbir Singh	Safety & Security	15/02/21	
Checked:	James L Boudville	Operations	16/2/21	
Checked:	Gan Lee Hong	Procurement	16.02.21	
Checked:	Raefendy Ismail	Material Management	16.2.21	
Checked:	Nauwalah Amat Mustakim	Finance & Administration	16/2/21	
Checked:	Suriani Farisa Md Isa	Human Resource	17.2.2021	
Checked:	Haryati Khalil	CEO Office	15.2.21	
Checked:	Muhammad Azim Abdullah	CEO Office	15/2/21	
Checked:	Anthony Arokianathan	Wayside	18/2/21	
Author:	Noel D	Systems	11 Feb 2021	
	Name	**Dept.**	**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

A	8 Feb 21	Department Re-structuring (ELT & SIG merged into SYS) Incorporated previous documents E00.OME.M15000.BT.0007.G and D10.OMW.M15000.BT.0001.E	Noel D
Revision	**Date**	**Modification**	**Name**

Planning Of Changes Reference For Revision: E00.OME.M15000.BT.1010.A					
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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1.0 Purpose

1.1 The purpose of this document is to provide guidance to the Systems (SYS) department in the management principle to be used for the purpose of providing safe and efficient maintenance of the Express Rail Link / Commuter Rail Service (ERL/CRS) Systems and to ensure on-time service as required by the latest Operations & Maintenance (O&M) contract.

1.2 This document also describes the various maintenance strategies, processes, resources, record management and deliverables of the SYS maintenance department.

1.3 To define various job functions of maintenance personnel in the SYS department.

2.0 Scope, Distribution & Access

This document provides an overview and technical references only, with all details and principles being provided by the supplier's manuals and presented as maintenance procedures for use by the relevant maintenance staff.

The strategy implemented is for all SYS personnel. This document can be accessed from the Electronic Document Management System (EDMS) by relevant SYS personnel.

The symbol * used in the document reference number refers to the latest version which is subject to change.

3.0 Maintenance Strategy

3.1 Scope

Systems (SYS) department is responsible for 6 different sub-groups, which are:

- Overhead Contact Line (OCL)
- Signalling (SIG)
- Track Vehicle (TVL)
- Telecommunication (TLE)
- Traction Power Sub Station (TPSS)
- Information Technology (IT)

The objective, commitment and function of SYS department can be referred to from Doc No. G00.OME.M11400.CE.1002.*.

3.2 SYS Organization Structure

To best utilize the manpower resources made available, SYS personnel are split into 6 sub-groups. The organization structure / working chart can be referred to Doc No. G00.OME.M11110.BB.1006.*. The various personnel and their job functions are described below.

3.2.1 Head of Department

Head of Department (HOD) shall lead the team with the following responsibilities:

- Responsible for all SYS department system maintenance activities and technical improvements.

- Responsible to ensure the department activities are carried out in accordance with the Operations & Maintenance (O&M) contract and timely manner with high quality standards to enable E-MAS to operate and maintain the ERL-CRS System efficiently.
- Responsible for overall Safety, Quality and Environment matters within SYS department and shall coordinate the resolution of incidents as required.
- Supervise the SYS workforce in accordance with the organizational structure
- To set departmental target, control and monitor key performances.
- To initiate and monitor training requirements for SYS staff
- Represent E-MAS regarding all SYS department matters
- Act as a central figure between the Operations and Maintenance department with regards to failure management as required

A copy of HOD – SYS's job description can be obtained from: Doc No. G00.OMH.M11120.ZJ.0062.*

3.2.2 Engineering Support and Development (ESD)

Engineering Support and Development group is formed to assist the HOD in technical and administrative issues. The ESD group consists of Engineer(s) and selected personnel to study, analyze and come up with a practical and effective recommendation for solving problems related to technical and administrative issues. The ESD group is also responsible for the maintenance, annual audit, planning and technical support of ERLSB IT assets at Depot and E-MAS IT equipment.

The ESD group reports directly to the HOD – SYS / delegate and assigned to work on normal office hours. However, for special maintenance activities such as testing, inspections or other special works, they may be required to work during the maintenance period as requested by the HOD – SYS / delegate.

Attachment 2 provides a detailed guide of the work process for ESD group. A copy of their job description is available from below

- Doc No. G00.OMH.M11120.ZJ.1172.* Assistant Manager (SYS)
- Doc No. G00.OMH.M11120.ZJ.1247.* Engineer (SYS)
- Doc No. G00.OMH.M11120.ZJ.1246.* Technical Executive (SYS)
- Doc No. G00.OMH.M11120.ZJ.1158.* IT Executive (SYS)

3.2.3 Supervisor

Each sub-groups (OCL, TPSS, TVL, SIG & TLE) is assigned with a supervisor to manage and maintain the work process and the welfare of staff. The supervisors are responsible for the efficient planning of manpower to perform the various maintenance activities described in Section 4.0 Maintenance Processes.

The supervisors are also responsible to monitor their staff's tardiness. Any discrepancies and abnormalities shall be highlighted to the HOD - SYS / delegate.

The supervisors are also responsible for the timely closing of the work orders within their group and to ensure data accuracy. Supervisors are assigned to work on morning shift / normal office hours.

Attachment 1 provides a detailed guide of the work process for the supervisor. A copy of their job description is available from below

- Doc No. G00.OMH.M11120.ZJ.0065.* Supervisor (OCL)
- Doc No. G00.OMH.M11120.ZJ.0069.* Senior Chargeman (TPSS)

3.2.4 Senior Technician / Technician

All SYS senior technician / technicians reports to their respective sub-group supervisor. In addition, they can also be assigned to perform work by the ESD group or HOD - SYS / delegate.

They are primarily responsible to carry out the preventive maintenance activities as planned and also attend to corrective maintenance works.

The OCL/SIG/TLE technicians work on a 3-rotating shift to provide 24-hour coverage. The TVL technician works on morning shifts and is on 24-hour standby when assigned. Personnel are allowed to swap shifts on a mutual consent basis subject to approval of supervisor and HoD / delegate using form Mutual Duty Swap Form, Doc No. G00.OME.M10000.DQ.1001.*

Attachment 3 provides a detailed guide of the work process of the senior technician / technician. A copy of their job description is available from below

- Doc No. G00.OMH.M11120.ZJ.0066.* Senior Technician (OCL)
- Doc No. G00.OMH.M11120.ZJ.0070.* Technician (OCL)
- Doc No. G00.OMH.M11120.ZJ.0074.* Senior Technician (TVL)
- Doc No. G00.OMH.M11120.ZJ.0075.* Technician (TVL)
- Doc No. G00.OMH.M11120.ZJ.1243.* Senior Technician (SIG)
- Doc No. G00.OMH.M11120.ZJ.1242.* Technician (SIG)
- Doc No. G00.OMH.M11120.ZJ.1245.* Senior Technician (TLE)
- Doc No. G00.OMH.M11120.ZJ.1245.* Technician (TLE)

3.3 Manpower Needs

3.3.1 Overhead Contact Line (OCL)

OCL group technicians are rostered to work on 3-rotating shifts. The primary activities of the OCL group are divided between the night and day shifts.

The day shift comprising morning and afternoon shifts perform all preventive maintenance activities that do not need special vehicles or power to be de-energized. These activities are normally of visual inspection type and / or works within the ERLSB network.

The night shift performs all preventive maintenance that needs either special vehicles and / or power to be de-energized. These activities are normally of servicing, measurement, adjustment, calibration and other types.

Due to the work requirement, each workgroup within OCL must have at least 2 - 4 personnel in it. Rules prescribed in Rulebook Section A Doc No. G00.OMZ.M10100.BT.0001.*. shall also apply.

For the night works that require vehicles, more than 1 workgroup can be combined to perform the job. This is subject to the planning of the OCL supervisor with approval from the HOD – SYS.

3.3.2 Traction Power Sub-Station (TPSS)

TPSS is an unmanned station which requires preventive maintenance activities as detailed out in the O&M manuals. This is subject to the planning of the TPSS supervisor with approval from the HOD – SYS.

3.3.3 Track Vehicle (TVL)

Track Vehicle (TVL) technicians are paired into 2 – 3 personnel and work on morning shifts. The main work area for the TVL group is within the Main Work Shop area. In addition to this, some work is also performed at depot area, stations and trackside. This is subject to the planning of the TVL supervisor with approval from the HOD – SYS.

Due to work requirements, TVL personnel will work in a group of minimum 2 personnel. Rules prescribed in Rulebook Section A Doc No. G00.OMZ.M10100.BT.0001.*. shall also apply.

3.3.4 Signalling (SIG)

SIG group technicians are rostered to work on 3-rotating shifts. They are based at both TPSS and Depot to ensure fast and effective response during failures. However, this is subject to the planning of the SIG supervisor with approval from the HOD – SYS.

Due to work requirements, SIG personnel will work in a group of minimum 2 personnel. Rules prescribed in Rulebook Section A Doc No. G00.OMZ.M10100.BT.0001.*. shall also apply.

3.3.5 Telecommunication (TLE)

TLE group technicians are rostered to work on 3-rotating shifts and/or 2 rotating shifts. TLE group technicians are based at Depot. However, this is subject to the planning of the TLE supervisor with approval from the HOD – SYS.

Due to work requirements, TLE personnel will work in a group of minimum 2 personnel. Rules prescribed in Rulebook Section A Doc No. G00.OMZ.M10100.BT.0001.*. shall also apply.

3.4 Location

To provide the best possible service for the ERL/CRS service, the SYS department's personnel are based in Depot and TPSS.
Their respective supervisor with the approval of HOD – SYS can make the stationing of personnel at other sites due to work requirement.

3.5 Spares & Services

All spares and consumables required by SYS to perform maintenance tasks are under the control and care of Material Management (MMT).

Spares that have a long lead-time are also purchased to be stocked by Material Management. In addition, parts are checked for obsolescence to avoid the unavailability of spares.

The movement of all spares, consumables and other items required (issuance, repair, scrapping and other related matters) including the handling of scheduled waste can be referred from Warehouse Operations Procedure, Docs No. G00.OML.M13500.CA.1001.*

The HOD – SYS shall monitor the consumption of spares as needed. The HOD – SYS is required to prepare the annual spares budget and/or to revise it as and when required by Management.

All activities related to purchasing, including meeting up with prospective suppliers shall be initiated by Procurement (PRC) based on the department's requirements and the purchasing shall be done in accordance to the Purchasing Procedure, Docs No. G00.OMU. M10540.CD.0008.*.

3.6 Training & Competency

Due to the nature of SYS's work, no personnel are allowed to work on site immediately upon hiring. All new hires / internal transfers must undergo orientation under the supervision of the respective supervisor. The duration of the orientation is to be determined by the supervisor with the approval of HOD – SYS.

Once personnel has undergone the orientation, he is assigned to a particular workgroup under the supervision of shift leader/senior technician. Here he will undergo on the job training under the shift leader/senior technician's supervision. Additionally, he will undergo subsystem related training by appointed personnel.

The specific details of the SYS training strategy can be referred from Docs No. E00.OME.M15000.BT.1012.*

3.7 Computerized Maintenance Management System (CMMS)

In E-MAS, the selected CMMS is the Systeme, Andwendungen, Produkte in der Datenverarbeitung (SAP) system. This system is used to plan preventive maintenance activities, report failures and obtain spares from the store. The SAP system is also used to record man-hours spend performing various different job functions as needed. The SAP system is used to analyze failure trends, goods movement and other functions.

The process flow for the SAP system and its use can be referred from SAP – Plant Maintenance Process Guide Docs No. G00.OMN.M11070.CZ.1001.*.

3.8 Reliability Centered Maintenance (RCM) Approach

To improve the systems's reliability, SYS has adopted the RCM approach in its subsystems.

Two RCM tools being applied are the Infrared Thermography and Oil Analysis method. Other tools may be applied in the future as necessary.

4.0 Maintenance Processes

The maintenance processes that are used within SYS department are described below.

4.1 Scheduled Maintenance

4.1.1 The scheduled maintenance is also known as Preventive Maintenance (PM)

4.1.2 The interval and tasks involved for PM is detailed from
a. Suppliers Star Charts / Task Cards from O&M manual
b. Suppliers Recommendation
c. Evaluation done within the SYS department (where applicable)

4.1.3 The interval is used to create maintenance plans in SAP. These plans will trigger work orders at the scheduled time or as required.

The interval is used to create an overview of the yearly PM schedule. The respective overviews are referred below.
a. OCL PM Overview – Doc No. U20.OME.M30000.DP.1003.*
b. SIG PM Overview – Doc No. E10.OME.M50000.DP.1001.*
c. TVL PM Overview – Doc No. E00.OME.M84120.DP.1001.*
d. TLE PM Overview – Doc No. E20.OME.M60000.DP.1001.*
e. TPSS PM Overview – Doc No. U10.OME.M40000.DP.1002.*
f. IT PM Overview – Doc No. E00.OME.M15100.DP.1001.*

4.1.4 The task to be performed shall be detailed in a checklist. The list of checklist is available in SYS – Record Matrix Docs No. G00.OME.M11465.QB.1001.*

The maintenance plan and checklist will be linked where possible.

4.1.5 The supervisor of the respective sub-groups attends the work orders triggered/created. The supervisor schedules the work orders to ensure all planned PM is carried out. These work orders are also used to withdraw required materials from the store or for TPR application for the works.

4.1.6 After the PM work is completed, the supervisor / assignee will close the work order in SAP. Refer to SAP – Plant Maintenance Process Guide Docs No. G00.OMN.M11070.CZ.1001.*.

4.1.7 All PM checklists are to be check, filed and kept by the supervisors.

4.1.8 Refer to Attachment 4 for a detailed work process for PM

4.2 Corrective Maintenance (CM)

4.2.1 The priority in these circumstances is to attend to the failure/fault and to get the repair work done urgently. On notification of failure (normally verbal notification by OCC/HOD-SYS/Supervisor), the maintenance personnel shall proceed with the work immediately; at all times following the safe working procedures laid down in the Company's Procedure Manual (CPM) Docs No. G00.OMQ.M11150.CA.0004.*. / Rules prescribed in Rulebook Section A Doc No. G00.OMZ.M10100.BT.0001.*. shall also apply.

4.2.2 In addition, the SYS Corrective Maintenance Guidelines Doc No. E00.OME.M15000.BT.1011* is referred.

4.2.3 The Operations Control Centre (OCC) shall make the failure notification via SAP. The respective supervisor will generate a work order from the notification. Costs of work are to be captured as in 4.1.5 and 4.1.6.

4.2.4 Refer to Attachment 5 for a detailed work process for CM.

4.3 Modifications / Improvements

4.3.1 The modification / improvement works may be initiated/proposed by any party (i.e. E-MAS, OEM)

4.3.2 E-MAS as the maintenance contractor shall notify ERLSB and receive approval for modification / improvement before it is carried out.

4.3.3 The modification / improvement strategy of the SYS department shall be to seek continuous development in below listed matters: (list not in priority order)

a. Safety
b. Process
c. Cost Reduction
d. Methodology / Techniques
e. Personal development of staff

The priority at any point in time (except for safety) shall be determined by the circumstances of the time and the needs of the ERL/CRS service.

4.3.4 Refer to Attachment 6 for a detailed work process for modification / improvement.

4.4 Communication Structure

4.4.1 SYS ←→ OCC

OCC will contact SYS personnel when a failure occurs. The mode of communication will be via hand portable radio. In case the personnel cannot be reached via hand portable radio, OCC shall try to contact the personnel via the shift / individual hand phone. All shift / individual hand phone numbers are listed in OCC.

If this too cannot be reached, OCC shall immediately contact the HOD – SYS / delegate to take the necessary immediately and follow up action. The communication flow between SYS and OCC is shown in Attachment 7

4.4.2 SYS Internal Communication Flow

The first point of communication regarding a failure is between OCC and the shift technician. The technician will then proceed to the incident site to rectify the failure. The technicians are required to inform their supervisor if the problem cannot be solved within 15 minutes of troubleshooting.

This will allow the supervisors to arrange the necessary assistance for the technicians. The supervisors are also required to inform HOD – SYS of the failures. Refer to Attachment 8 for SYS internal communication flow.

5.0 Resources

The perform the above mentioned maintenance processes effectively, the Management of E-MAS allocates SYS with certain resources.

5.1 Company Hand Phone

The company wide procedure governing the use of telecommunication facilities, refer Doc No. G00.OMM.M11150.CD.1005.* applies to this section.

5.1.1 Individual Hand Phone

Individual hand phone allowance is provided for key personnel in the SYS department. These users must be able to be contacted at all times and hand phone must be switched ON at all times.

5.1.2 Shift Hand Phone

These hand phones are provided for identified subgroups to be used by rotating shift personnel. These hand phones are to be used and maintained in a responsible manner. These hand phones must be switched ON at all times as the users must be able to be contacted at all times.

It is their duty to settle the phone charges individually if personal calls are made. If certain charges cannot be justified, the personnel in the group will share the cost. The supervisors will collect the payment for the shift hand phones.

5.2 Company Vehicle

The company wide procedure governing the use of company vehicles, refer to Doc No. G00.OMM.M11715.CD.1008.* applies to this section.

The below are the vehicles assigned to SYS

a. Toyota Hilux(s) primarily used by OCL shift and SIG shift
b. Proton Persona(s) primarily used by TLE shift, HOD – SYS, SYS personnel

5.3 Tools

5.3.1 Tools usage

All required tools are provided to personnel to be used when performing their daily duties. No unauthorized tools should be used. All tools must be used in accordance with the O&M manual. The lists of tools are in the following documents.

1. SIG – Doc No. G00.OME.M15510.RD.1003.*

2. ELT – Doc No. G00.OME.M15510.RD.1002.*

All personnel are required to

i) Maintaining tools safely and cleanly. Tools should be cleaned and kept after use and kept in the storage provided.

ii) Tools being damaged. The personnel must submit an incident report form to his supervisor if tools are damaged. If tools are damaged, the repair/replacement cost will be borne by E-MAS. The damaged tools must be tagged and returned to the supervisor to be repaired/replaced. The supervisor shall arrange for further action and arrange for spare tools to be provided to the personnel as needed to carry out their maintenance activity.

iii) Tools being missing. The personnel must submit an incident report form to his supervisor if tools are missing. Once the incident report is received, the supervisor will perform a tools audit. The supervisor will initiate necessary action as needed for replacement of the missing tools.

a) Individual tools

Personnel are provided with individual tools where necessary. The personnel receiving such individual tools are responsible for:

i) Signing and acknowledging tools received against tools record list. This will occur during first time issuance.

ii) Personnel is responsible to have his tools with him to perform his daily job. If work is delayed or postponed due to the unavailability of tools, disciplinary action will be taken against personnel.

iii) If tools are missing, the personnel is responsible to replace the identical tool. If not replaced, the company will deduct the cost of the tool from personnel salary. This action is to be initiated by the supervisor and manager.

iv) Returning tools to supervisor when leaving the company as part of exit clearance.

b) Shared tools

These are tools, test meters and other maintenance equipment. These tools are normally assigned by subgroups. These tools are to be handed over from shift to shift. All personnel of the subgroup are collectively responsible for these tools. If tools are missing, personnel of the subgroup are responsible for replacing the missing tools. This action is to be initiated by the supervisor and manager.

5.3.2 Audit

Tools shall be audited once a year. The HoD is responsible to ensure tools audit is done and the report submitted to management. For SYS, tools audit is planned for April each year but may be changed due to work requirements. The responsible person(s) for the audit is appointed from within SYS by the HOD – SYS.

Tools owners shall make available tools to be audited (internal audit / external audit) as and when requested by management.

Refer to Attachment 11 for SYS tools audit process flow.

5.3.3 Calibration

The responsible person(s) for the calibration is appointed from within SYS by the HOD – SYS. The person(s) will be responsible for all the works within the calibration scope typically:

- Plan the calibration and verification schedule
- Monitor the calibration and verification schedule
- Manage the measuring instruments
- Raise the calibration / verification requisition form and other related forms as required
- Check measuring instruments after calibration is done for any damage/defect
- Verify the results of measuring instruments upon receiving the certificate / report and instruments from the calibration or in-house verification. This shall also include the presence of a status sticker on the instrument itself. The certificate / report must be stamped and signed on the cover page that includes confirmation on pass / fail remarks.
- Manage and update calibration / verification status in the following documents
    1. ELT - Doc No. G00.OME.M11411.RD.1001.*
    2. SIG - Doc No. G00.OME.M11411.RD.1002.*
- Any other calibration / verification works directed by HOD – SYS/delegate from time to time.

All measuring instruments shall be calibrated in accordance with the calibration date. There are 2 different methods of calibration which are internal verification or external calibration. Internal verification is only done for multimeter. External calibration is done by third party service providers.

Any measuring equipment that is out of accuracy after calibration and/or verification, appointed person shall inform HOD – SYS. HOD – SYS shall decide either to repair or scrap or continue for limited use of the said measuring equipment. An “Out of Accuracy” tag shall be attached to the instrument for easy identification if for limited use. If the decision is to scrap, the company wide established scrapping process flow applies. If the decision is to repair, the company wide established repair process flow applies.

For safekeeping of original records such as the certificate of calibration and such, shall be kept and maintained by Document Controller (DC). Working copies of the calibration and/or verification process may be maintained within the department.

SYS calibration process flow can be referred to in Attachment 9 and Attachment 10.

6.0 Maintenance Record Management

6.1 Work Order

SAP Plant Maintenance module is used to generate notifications and work orders for maintenance activities.

The supervisor/assignee is responsible to close the work orders. They are also responsible to ensure the accuracy of data input into the work orders. Work orders with the task completed are not to be left unclosed for more than a month.

The supervisor/assignee is required to justify (either in written form or verbally) the unclosed work orders when requested by management.

Refer to Attachment 12 & 13 for SYS's, unscheduled maintenance process flow and scheduled maintenance process flow.

6.2 Incident Management

6.2.1 Incident report

In the event of a failure that causes service disruption or considered failure of a critical system, an incident report shall be created. This incident report will contain all details (time, location, personnel/material involved) relating to the failure and clearly specify the chronology of the event. Suggestions and comments for improvement should also be included in the incident report.

The comprehensive incident report is to be created by ESD personnel and concurred by the relevant supervisor for submission to HOD – SYS. After obtaining HOD – SYS signature, the report shall be given to DC for circulation and filing for reference, action and failure analysis.

As needed, HOD – SYS will take the matter concerned to the attention of Wayside Manager.

6.2.2 Failure analysis

Major failures that involve critical system failure or any repetitive failure require a thorough failure analysis to be carried out. This analysis will be done by ESD personnel with support from the relevant subgroup. Failure analysis may require reviewing of documents, testing and simulation of events.

After completion of the failure analysis, a report is then submitted to the HOD – SYS. After obtaining HOD – SYS signature, the report shall be given to DC for circulation and filing for reference, action and failure analysis.

The matter may also be referred to the system supplier for further action if necessary.

As needed, HOD – SYS will take the matter concerned to the attention of the Wayside Manager.

6.2.3 Accident / Incident

In the case of an accident / incident at workplace that involves personnel / machinery / equipment, the concerned personnel shall prepare an accident / incident report. The form to use is the E-MAS Safety and Health Incident / Accident Reporting Form, Doc No. G00.OMZ.M15880.RW.0028.*.

7.0 Deliverables & Performance Management

7.1 Deliverables

The application of the strategies, processes, resources and record management described above together with other SYS documents listed in the SYS Documentation Structure, Doc No. G00.OME.M15000.BK.1001.*, is aimed to achieve the following

a) Safe and reliable train service as mandated in the O&M contract
b) Downward trend of failures
c) Overtime at a minimum level

7.2 Performance Management

The following reports produced within the department or company indicates the performance of SYS department. These reports are

a) KLIA Ekspres & KLIA Transit On-time Train Service Performance (Doc No. G00.OMM.M11755.RL.1001.*)
b) SYS – Measurable Target (Doc No. E00.OME.M11755.BL.*.*)

8.0 QEMS

Systems department is committed to the Quality and Environmental Management Systems (QEMS) of E-MAS. The QEMS is applicable to this document and the following documents of SYS

a. SYS Corrective Maintenance Guidelines – E00.OME.M15000.BT.1011.*
b. SYS Training Management Procedure – E00.OME.M15000.BT.1012.*
c. SYS Daily Status Reporting Procedure – E00.OME.M15000.RQ.1003.*
d. SYS IT Procedure – G00.OME.M15000.BT.1003.*

9.0 Other

Additionally, SYS department also coordinates the following activities.

9.1 Efficient Management of Electrical Energy Regulations 2008

Reports are submitted to the Energy Commission as per their guidelines.

9.2 Electrical Safety Management

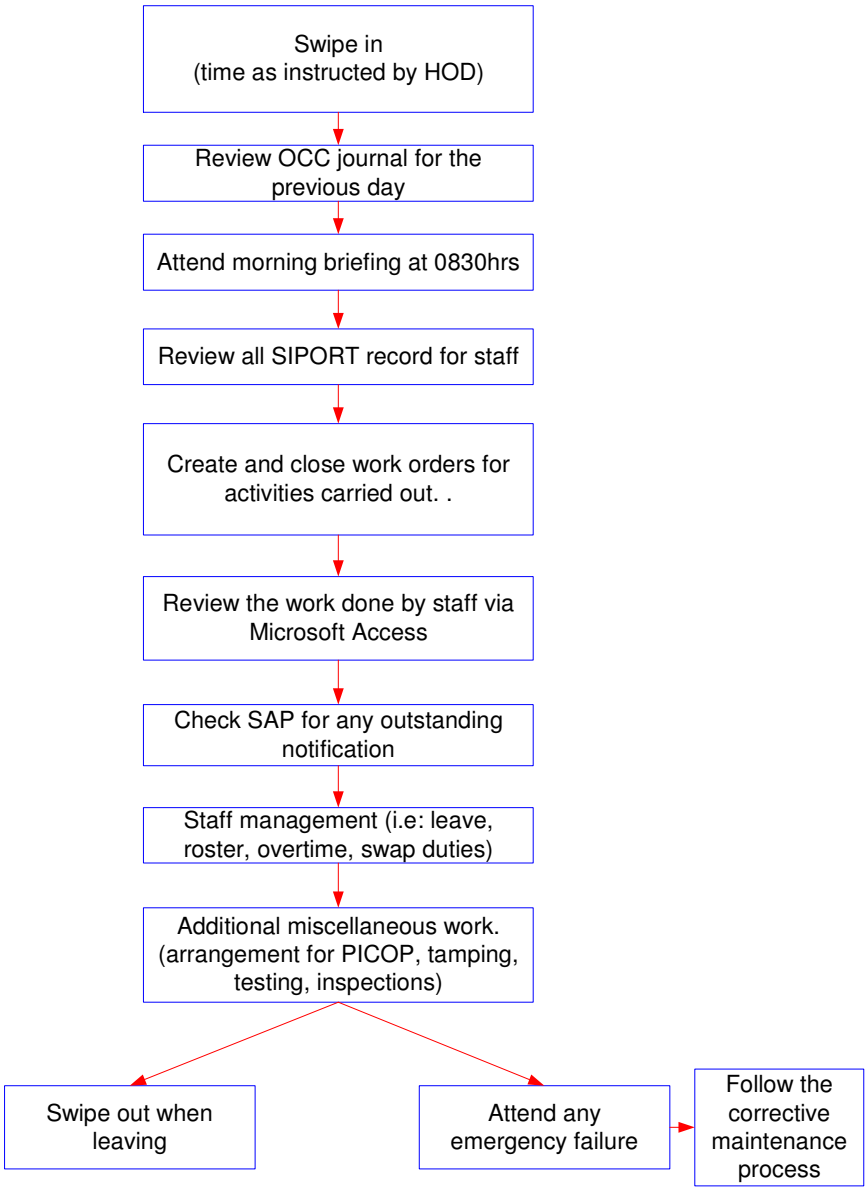
As per, Electricity Supply (Amendment) Act 2015 (Act A1501), an electrical safety management system has been established, which is detailed in the Electrical Safety Management Manual, Doc No. G00.OME.M11150.CA.1001*

Appendices

1. Daily work process – Supervisor
2. Daily work process – Engineering Support & Development
3. Daily work process – Technician
4. Scheduled maintenance process
5. Corrective maintenance process
6. Modification / improvement process
7. Communication between SYS and OCC
8. SYS internal communication flow
9. Work flow for tools /equipment to be send for calibration / verification
10. Work flow for tools / equipment received from calibration / verification
11. Work flow for tools audit
12. Unscheduled maintenance process flow
13. Scheduled maintenance process flow

Attachment - 1

Daily Work Process-Supervisor

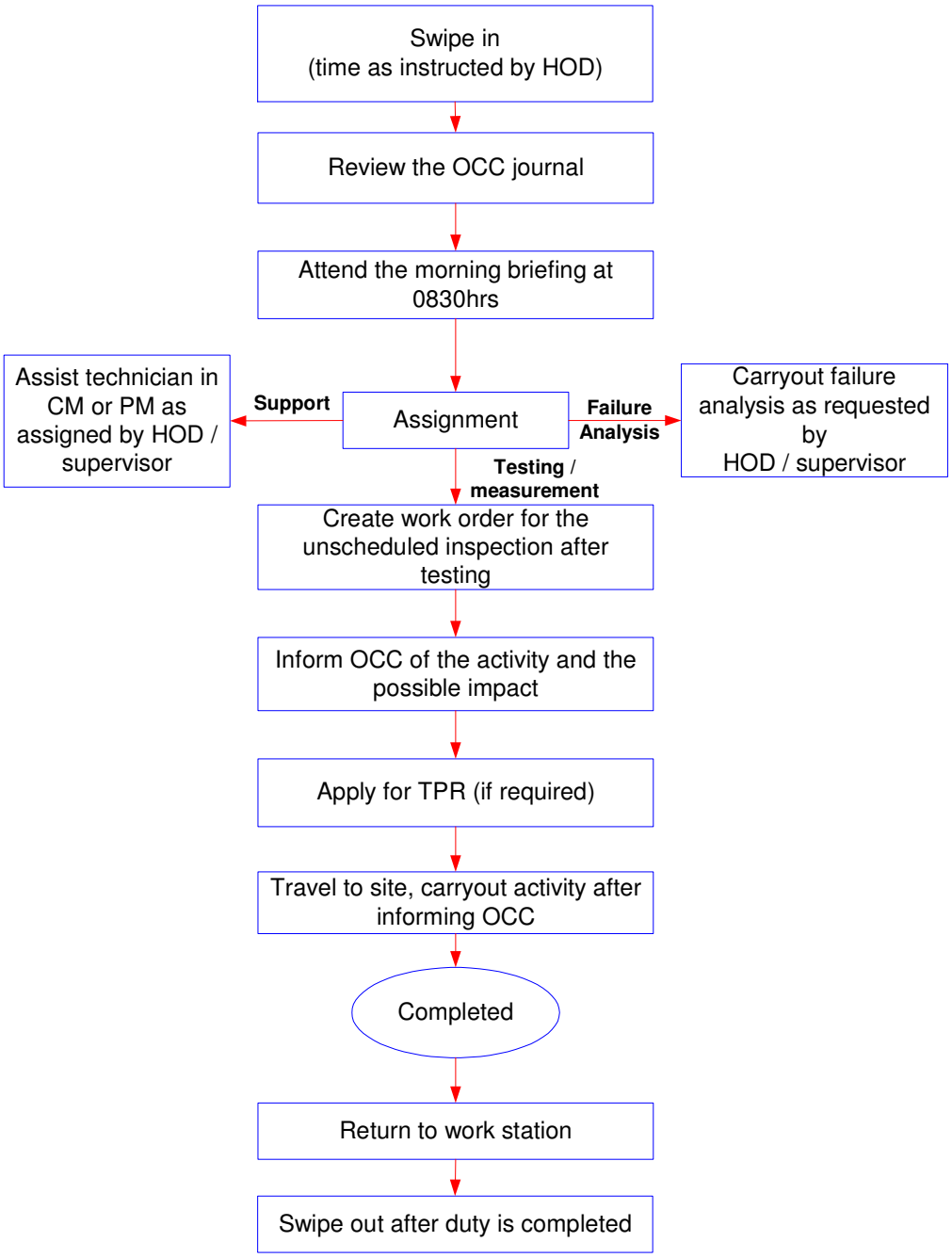


Note:

- Supervisors are required to swipe in and out.
- Supervisors are to update SYS - HOD of the maintenance activities issues / work order issues
- Supervisors are required to submit the staff overtime twice a month to SYS - HOD and relevant personnel
- This process flow is not exhaustive and other duties may be assigned

Attachment - 2

Daily Work Process - Engineering & Development

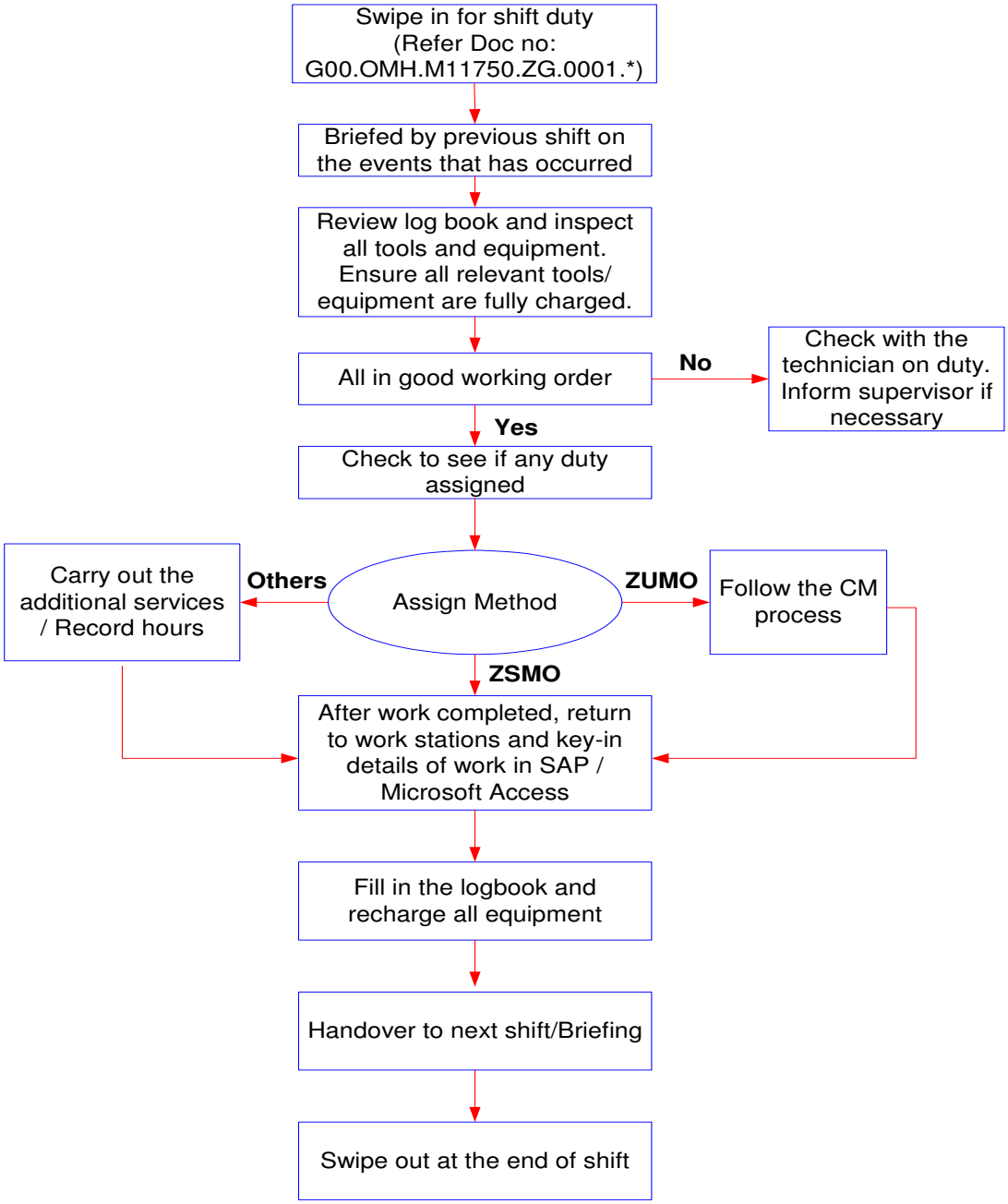


Note:

- ESD personnel are required to swipe in and out.
- ESD personnel are to update SYS - HOD of the maintenance activities issues / work order issues
- This process flow is not exhaustive and other duties may be assigned

Attachment - 3

Daily Work Process- Technicians

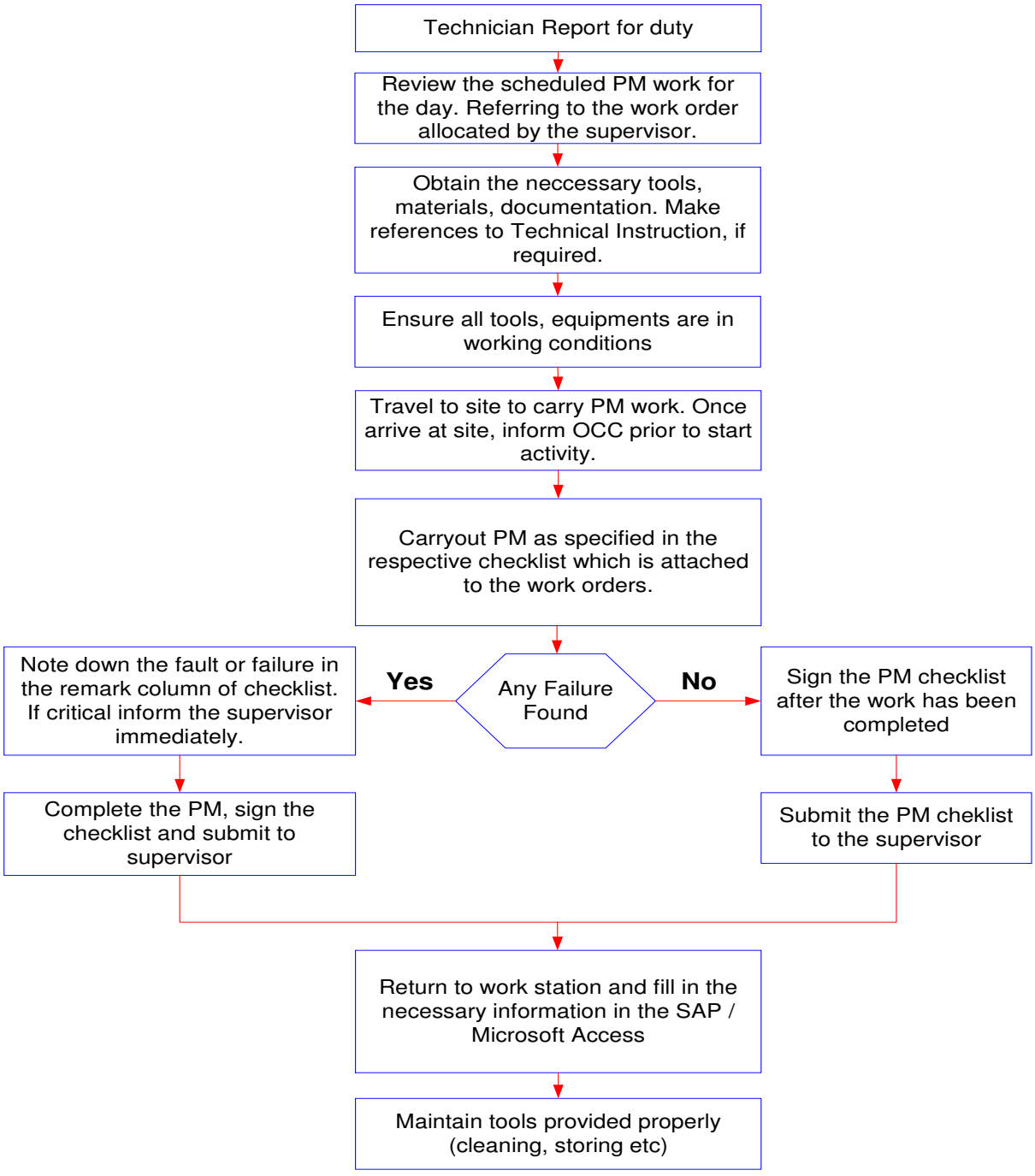


Note:

- Technicians are required to swipe in and out.
- Technicians are to update supervisor and SYS - HOD of the maintenance activities issues
- This process flow is not exhaustive and other duties may be assigned

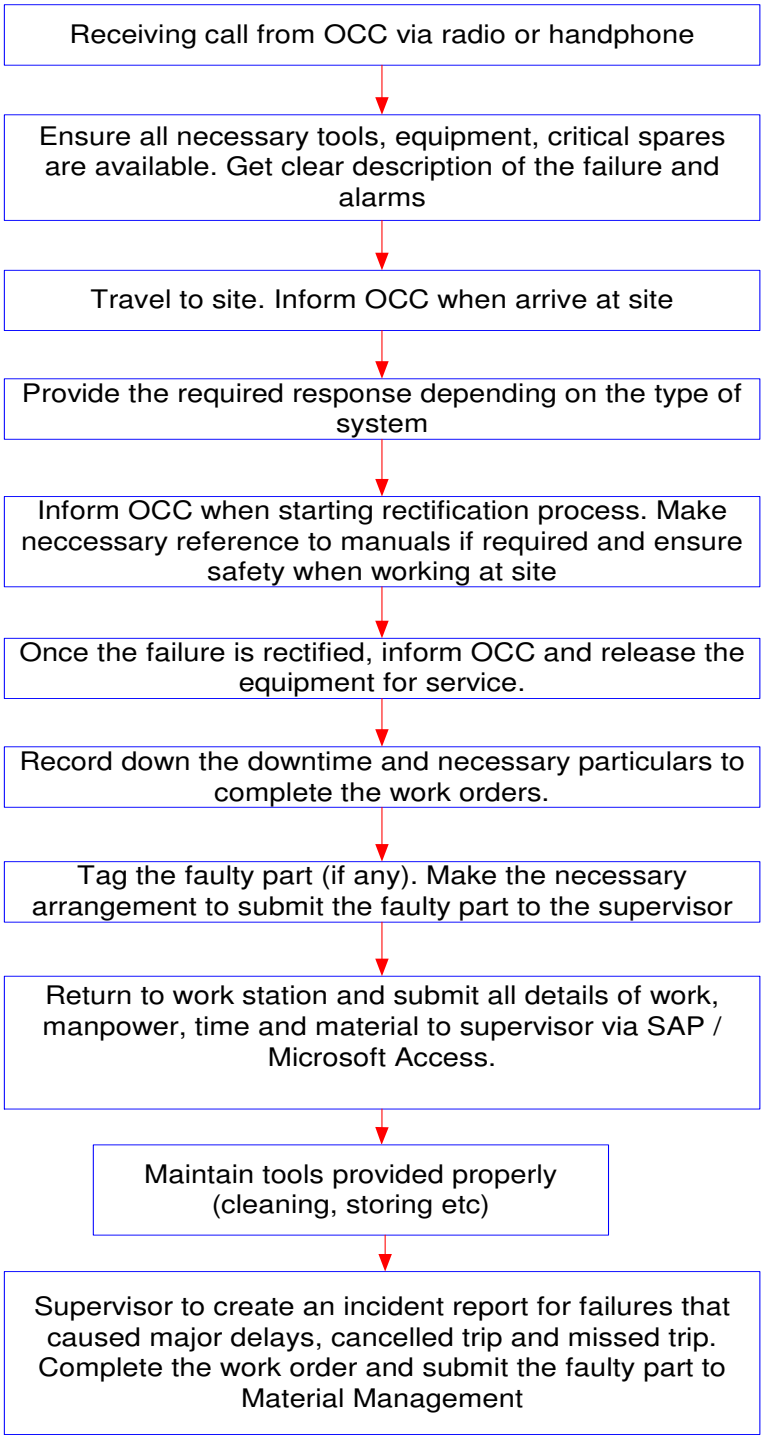
Attachment - 4

Scheduled Maintenance Process



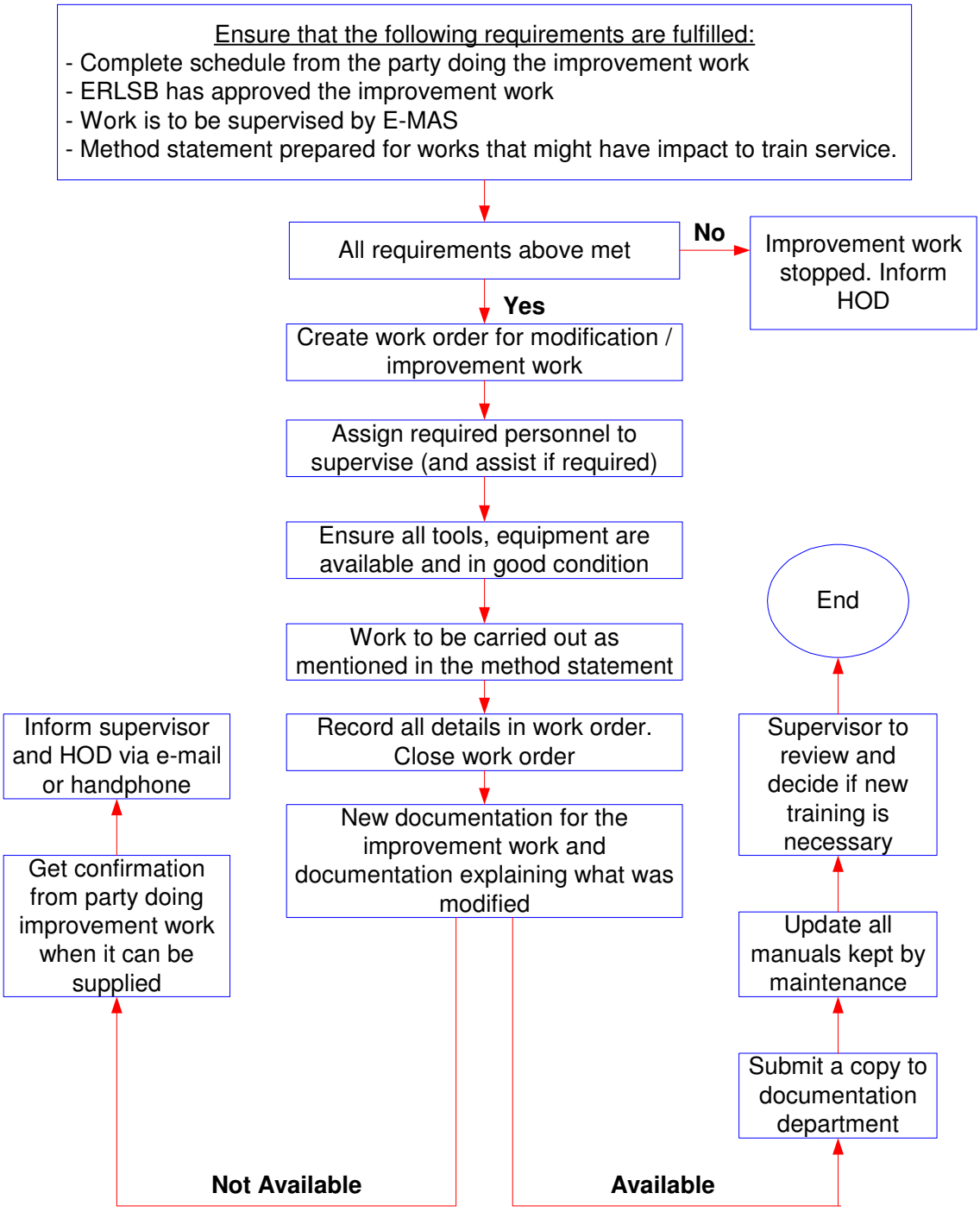
Attachment - 5

Corrective Maintenance Process



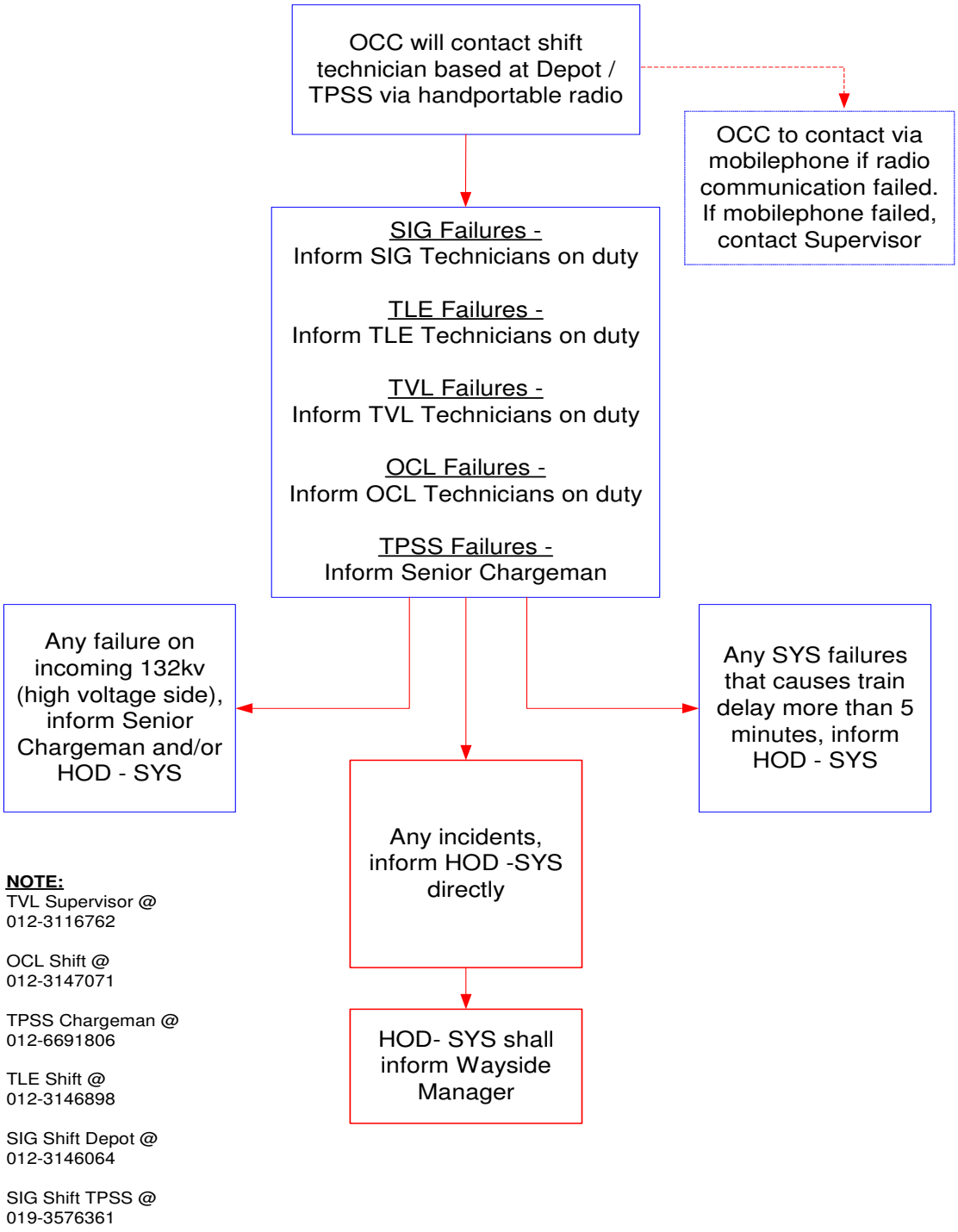
Attachment - 6

Modification/Improvement Work Process



Attachment - 7

Communication Between SYS and OCC



NOTE:
TVL Supervisor @
012-3116762

OCL Shift @
012-3147071

TPSS Chargeman @
012-6691806

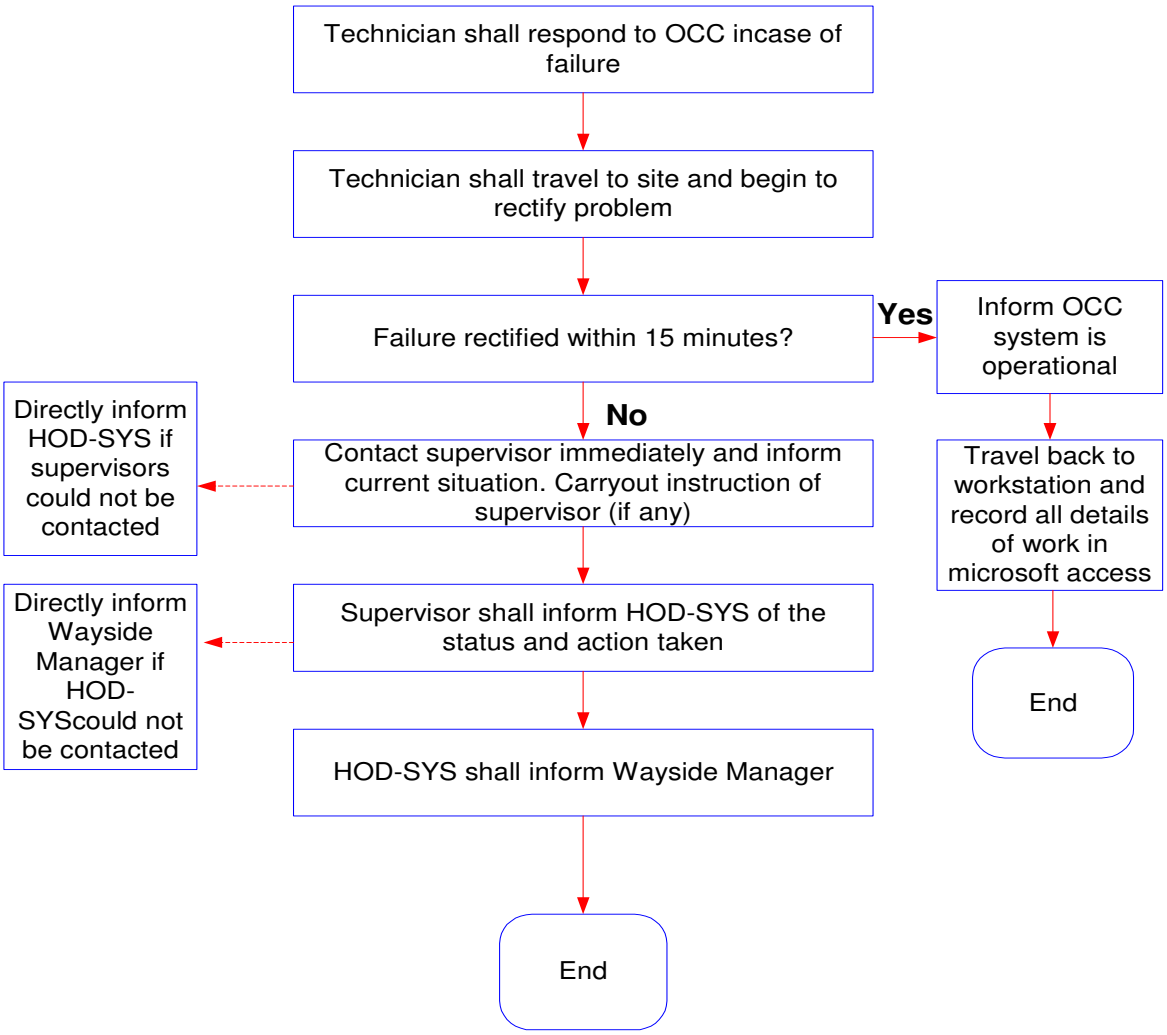
TLE Shift @
012-3146898

SIG Shift Depot @
012-3146064

SIG Shift TPSS @
019-3576361

Attachment - 8

SYS Internal Communication Flow

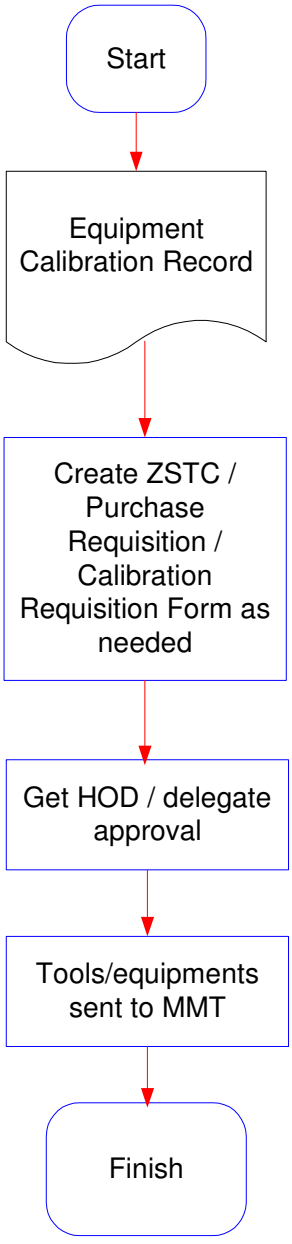


Note:

- A suitable instant messaging app (eg - Whatsapp, Telegram, Signal) shall also be used for communication within SYS and its subgroups
- Supervisors & HOD are responsible to ensure information flow is established and practised within SYS and its subgroups

Attachment - 9

Work Flow for Tools / Equipment to be send for calibration / verification

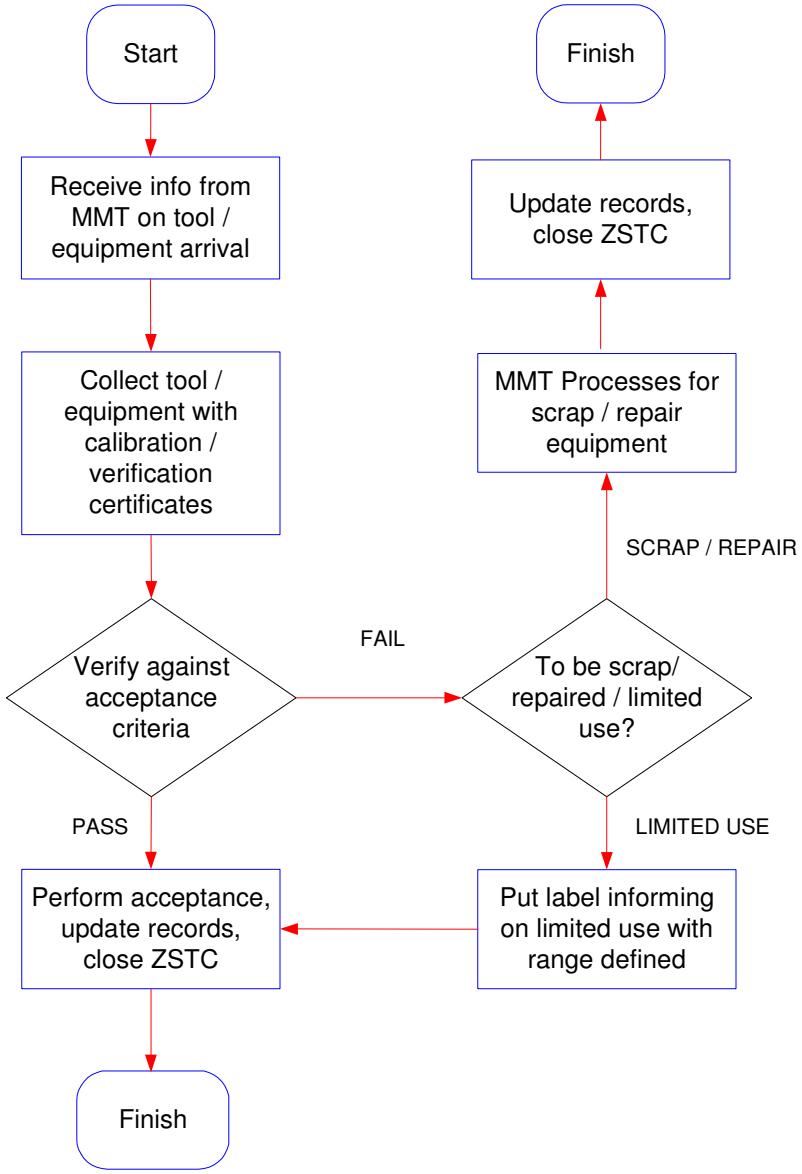


SYS - ELT Equipment Calibration Record, EDMS Doc No : G00.OME.M11411.RD.1001.*
SYS - SIG & TLE Equipment Calibration Record, EDMS Doc No : G00.OME.M11411.RD.1002.*

ZSTC = Scheduled Tools Calibration Work Order from SAP
Purchase Requisition, EDMS Doc No: G00.OMU.M10540.CD.1010.*
Calibration Requisition Form EDMS Doc No: G00.OMN.M11411.DQ.0001.*

Attachment - 10

Work Flow for Tools / Equipment received from calibration / verification

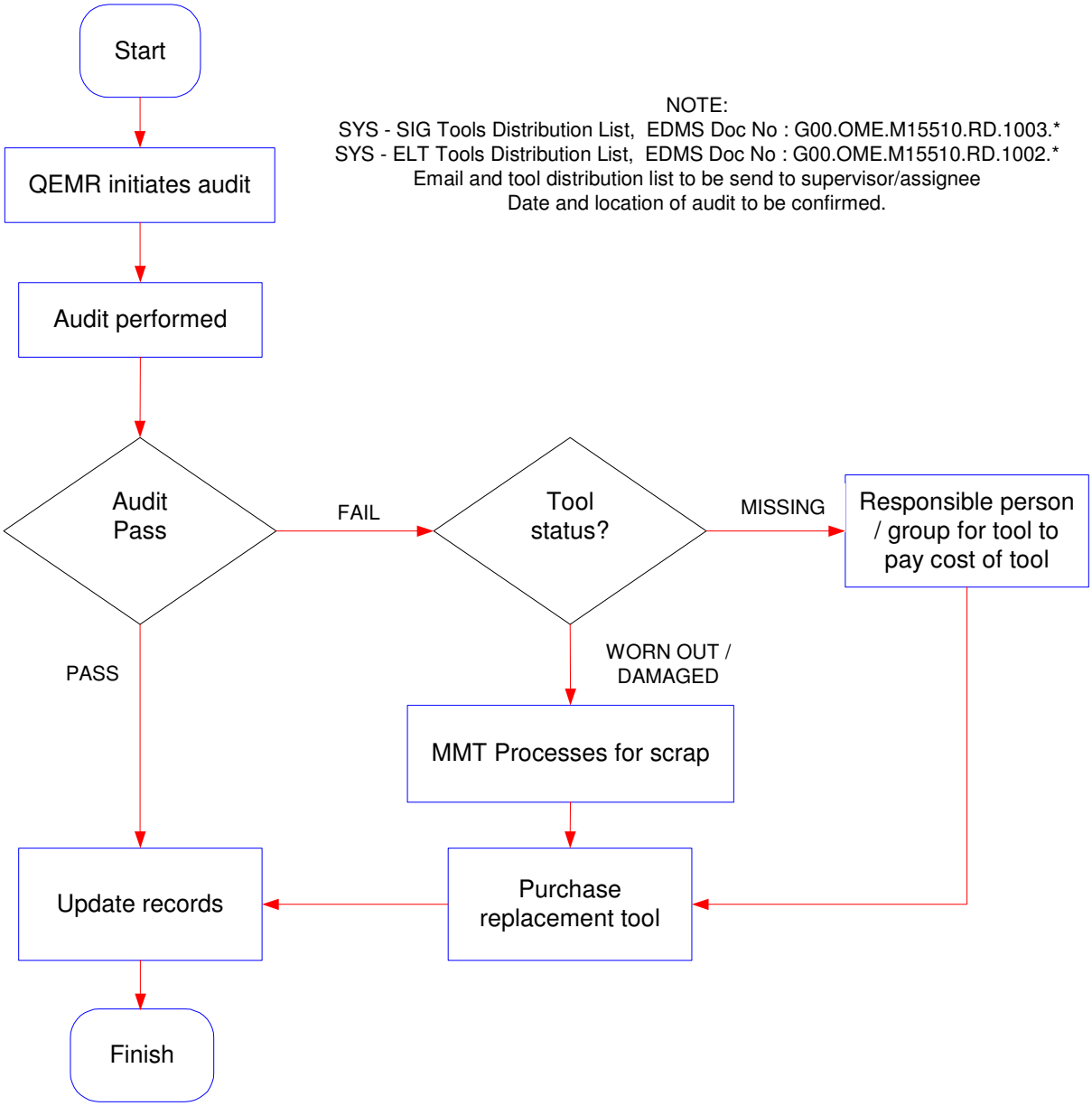


Responsible person to recommend on the tools/ equipment is to be scrapped, repaired or for limited use only. HoD or delegate shall concur and endorse.

SYS - ELT Equipment Calibration Record, EDMS Doc No : G00.OME.M11411.RD.1001.*
SYS - SIG & TLE Equipment Calibration Record, EDMS Doc No : G00.OME.M11411.RD.1002.*

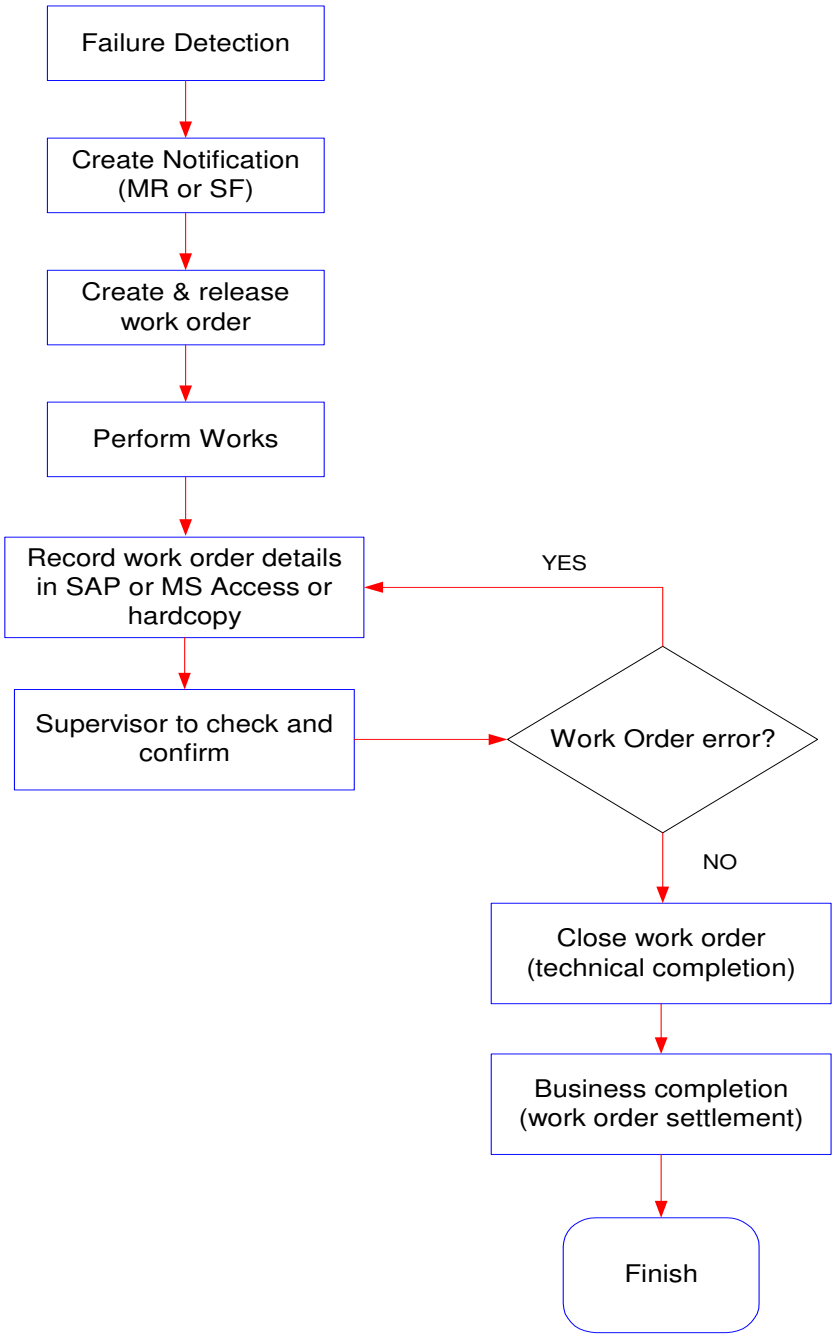
Attachment - 11

Work Flow for Tools Audit



Attachment - 12

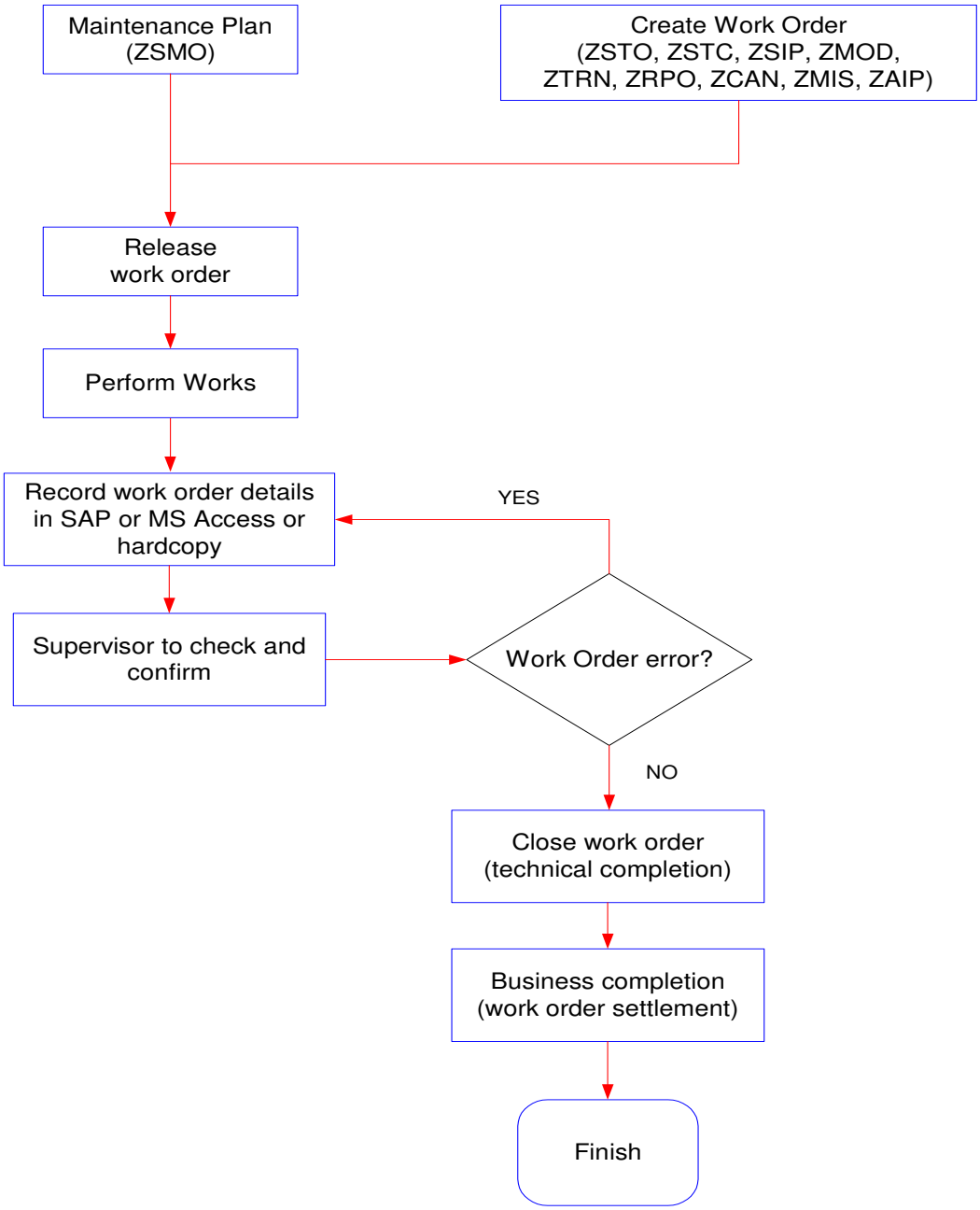
Unscheduled Maintenance Process Flow



Note: FIN performs business completion for TECO work orders after 90 days to enable maintenance to settle any open work orders pending spare part, resources etc.

Attachment - 13

Scheduled Maintenance Process Flow



Note: FIN performs business completion for TECO work orders after 90 days to enable maintenance to settle any open work orders pending spare part, resources etc.