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Volume 7, Chapter 2

Work Closeout Procedure

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1.0 PURPOSE

Work Closeout is a mainly administrative activity that is the near-final stage of maintenance work and is a procedure often under a time pressure to process quickly on the assumption that the work has been completed.

The purpose of this Procedure is to highlight the key aspects and steps in Work Closeout. Work Closeout is the final step for ensuring that the stakeholders that rely on the Technician and delivery teams receive the information they need. A Work Closeout Procedure also ensures that a maintenance organization has consistent documented evidence, of work statuses and maintenance history.

2.0 SCOPE

The scope of this Work Closeout Procedure is to provide advice when managing a Work Order from when the Technician presents it as 'complete' through a Quality Assurance process to the status of 'closed'. This advice is presented in narrative and flowchart forms.

The advice is applicable across various types of contracts and operating models, including multi-site contracts, outsourced delivery models, and specialist environments.

This Procedure is intended for application within a hard service, maintenance environment. However, the same principles can also be applied to the soft services environment.

3.0 DEFINITIONS

Term	Definition
Child Work Order	Work Order created from and relating to another Work Order (parent) e.g., 'Corrective Maintenance'
Closed	WO status after 'Complete'. This status usually means that the WO information cannot be changed or corrected
Complete	WO status before 'Closed'. This status usually means that the WO activity and resource usage will not change, unless there is a delay in staff submitting timesheets or invoices are received. The WO can be updated and corrected
Data Requirements	Describes the type of advice or information needed by the AMS/CMMS at identifiable steps in this Procedure.
Integrated Works	See Unplanned Work
Quick Work	An unplanned, work opportunity that can be integrated into the working day without delaying the main work
Unplanned Work	Any piece of work that requires emergency or urgent response, or when a 'Quick Work' opportunity arises. Sometimes referred to as Integrated Work
Work Control	Refers to the management of planning and execution of resources to meet the needs of planned and unplanned contractual and customer requirements
Work Management Center (WMC)	The team responsible for the management of planning and execution of resources, to meet the needs of planned and unplanned contractual and customer requirements. For more information, refer to Volume 7.2: Work Control
Work Order (WO)	Formal instruction to work
Work Order Pack	The paperwork and materials compiled by the WMC team or others for use by the Technician. Likely to include the WO, RAMS, access permits, drawings, consumables, and replacement parts. Sometimes referred to as a Work Package
Acronyms	
AMS	Asset Management System

CMMS	Computerized Maintenance Management System
HSSE	Health, Safety, Security, and Environment
KPI	Key Performance Indicators
PDA	Personal Digital Assistant. A handheld device for the transmission of information between a Technician and the WMC or CMMS. May take the form of tablet, cellphone, etc.
POWRA	Point of Work Risk Assessment
RAMS	Risk Assessments and Method Statements

Table 1: Definitions

4.0 REFERENCES

- National Manual of Assets and Financial Management (NMA&FM) – Volume 6 Chapter 2: Formality of Maintenance Performance
- National Manual of Assets and Financial Management (NMA&FM) – Volume 6 Chapter 27: Post Maintenance Testing (PMT)
- National Manual of Assets and Financial Management (NMA&FM) – Volume 7: Work Control
- National Manual of Assets and Financial Management (NMA&FM) – Volume 10: Health, Safety, Security, and Environment (HSSE)

5.0 RESPONSIBILITIES

A sample of key personnel involved in this Work Closeout Procedure is given below:

Role	Description
Work Management Center (WMC) Team	Consists of Help Desk, Scheduling, and Planning staff. The Work Management Centre (WMC) Supervisor, and possibly some staff, may have authorization permissions when escalated decision-making is required.
Technician	Responsible for responding to notifications and instructions from the WMC, and carrying out the work. May be an 'on-call' Technician.
Supervisor	Responsible for making decisions on solutions, urgency, escalation, and quality. These are usually the Line Managers to the Technicians
Custodian	This is the group of both technical and non-technical staff, usually employed by the building owner or tenant. They are usually responsible for items such as access permissions, hosting/escorting visitors, and issuing of site-specific work or safety control documentation.
Contractor	Refers to the Maintenance Contractor who is required to follow this Procedure, as well as their subcontractors and suppliers.

Table 2: Responsibilities – Work Closeout Procedure

6.0 PROCESS

6.1 Introduction

Whilst this Work Closeout Procedure outlines the main steps that need to be taken in most situations, each contract, contractor, and facility will have their own varying complexities, and should use this document as a basis for developing their own, detailed procedures. This Procedure should be considered the minimum standard for Best Practice.

Effective adoption of a good Work Closeout Procedure brings benefits from having access to accurate operational status and contractual and technical trends that can input to development of budgets, Key Performance Indicator (KPI) formation, reliability risk management, and quality assurance.

This document should be read in conjunction with other documents stated in the Section 4.0 References.

6.2 Work Closeout Procedure

A Work Closure Procedure defines the activities and decision-making steps required for the execution of maintenance work. From post-scheduling to work closure, with activities involving technical and non-technical people at both the Work Management Center (WMC), as well as off and on-site.

A key aspect of this Procedure is the timely inclusion of complete, correct and accurate information and data for recording in the Asset Management System (AMS)/CMMS, including the 'Failure Code' related to the work.

The correct and complete recording and inputting of data in to the AMS/CMMS is useful to traditional time-based Planned Maintenance but is essential in a Predictive Maintenance environment. Accurate and prompt updated information in the AMS/CMMS is essential to the operations management.

A flowchart of high-level steps outlining this Work Closeout Procedure is shown in Figure 1, below. A more detailed Work Closeout flowchart, (Figure 2: Work Closeout Procedure Flowchart), is included in the Appendix as Attachment 1.

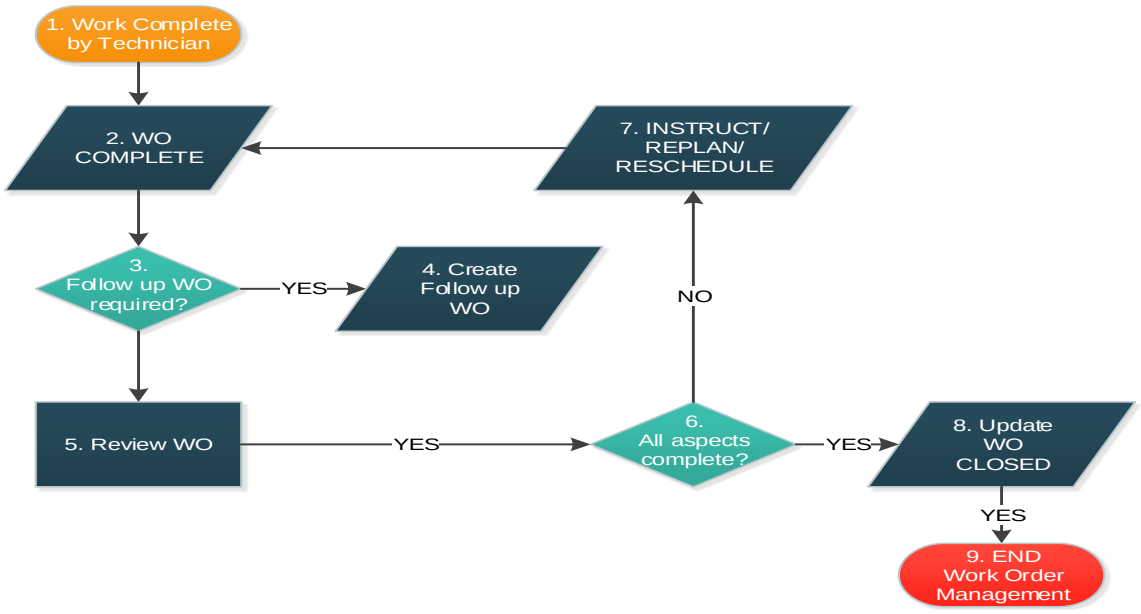

Figure 1: Work Closeout High Level Flowchart

1. WO is considered completed by Technician
2. WO status in CMMS is updated to COMPLETE
3. Technician reviews whether related WOs are required
4. WMC raises a follow-up WO
5. Supervisor reviews WO and recorded details in the CMMS
6. Supervisor or WMC consider most appropriate CMMS status to apply, and update and close the WO
7. Action is placed on the WMC if necessary, and on the Technician to carry out the WO
8. Aspects of the WO are considered compliant, and the CMMS status changed
9. WO information is set and available to Stakeholders

6.3 Documenting Work Closeout

Work Order Management is defined as including the tasks of resource accounting, reports and updates, and stakeholder feedback.

The completeness and accuracy of data gathered by the Technician and availability and accuracy of the readings, provided by the facilities monitoring systems are the main dependencies on the progress of the Work Order flowing through this Procedure.

Other relevant procedures include ‘Maintenance Procedures Writers Guide’, ‘Performing Work’ and ‘Post Maintenance Testing’.

During the Work Closeout activity, a Work Order may be returned to the Technician for several reasons. Because the Work Order is presented to the Supervisor as ‘Complete’, it may be that the CMMS status is changed back to ‘In Progress’ so that the correct status, such as ‘Pending – travel’ can be attached.
Depending on the capabilities of the CMMS and the requirements of the contract, the CMMS may or may not be configured to accept recording of data. A Work Order instruction may require in a way that is useful for performance or fault analysis.

This level of information is essential for performance analysis, when trying to identify weaknesses in the maintenance operation. The potential over-use of non-productive time needs to be monitored. Equally, the correct selection of ‘failure code’ will provide good quality data for failure analysis. This can have a contractual impact should a financial claim by the maintenance contractor be made to the client centered on the condition of the equipment and systems.

When closing emergency and urgent Work Orders the Work Management Center should consider updating the stakeholders as soon as the work is reported by the Technician as complete. This immediate notification is faster than the updating cycle of the AMS/CMMS and may be more appropriate than the stakeholders waiting for the automated update.

Failure Codes are applicable to unplanned maintenance and is defined as an abbreviation that identifies the observed or confirmed cause of the failure of an item of equipment or system. They provide consistency in documenting failure events based on predetermined categories, and logical groupings to refine the data mining process in order to drive improved equipment reliability. The Work Closeout stage of a Work Order is the final and confirming step when the correct Failure Code can be assigned and is therefore important for Maintenance History and continuous improvement reasons.

‘Resource Accounting’ refers to the office based activity of using resource data of time, material, skillsets, tools, etc. to analyze for the purpose of improving productivity, compliance and profit.

6.4 Work Closeout Procedure Narrative

1. Record required information
   a. A Work Order has been completed by a Technician and the CMMS input information is being prepared
   b. The Work Order will follow one or more of the following Procedures:
      i. Maintenance Procedure
      ii. Performing Work Procedure
      iii. Post Maintenance Testing
      iv. Maintenance History Procedure
   c. Predictive Maintenance or similar data-intensive work should also follow this Work Closeout Procedure
   d. Predictive Maintenance should use actual recorded values whenever possible, and the Maintenance Procedure should identify the acceptable limits before corrective action is required. If a recorded value is outside of the stated acceptable limits, the Technician should highlight this, and if necessary, raise a 'Corrective Maintenance Work Order';
   e. The Technician will record or update the Failure Code assigned to the work
   f. Next Step: (2) Update WO status COMPLETE

2. Update WO status COMPLETE
   a. If the Technician has a Personal Digital Assistant (PDA) and the authority to update the WO status to COMPLETE, they should do so. Otherwise, this task is carried out by the WMC
   b. Depending on the capability of the CMMS, the Supervisor should receive a notification of this change of status
      Next Step: (**Error! Reference source not found.**) Related WO required?

3. Related WO required?
   a. The Technician should check the need for additional work associated with this WO, either Corrective Maintenance or other;
   b. Next Step: (4) Create Related WO

4. Create Related WO
   a. If the Technician has a PDA and the authority to raise a Corrective or Related WO, they should do so. Otherwise, this task is carried out by the WMC
      i. The CMMS will require a minimum amount of information to be provided
      ii. If raised by the Technician on a PDA, automatic notification should be made to the Supervisor and/or WMC
   b. Next Step: (5) Work Completion Requirements?

5. Work Completion Requirements?
   a. The Supervisor/Work Management Center will review Work Orders for quality. This is likely to be carried out on a batch basis, and the frequency will depend on both the quantity of WOs, and the Quality Assurance requirements of the contract.
   b. The Supervisor may decide to call the Building Custodian to understand the level of satisfaction or visit the site to assess the tidiness of the workspace, and any issues associated with recording of data, or the quality of the workmanship
   c. This review may be followed as often as twice per day, and/or as infrequently as once per week;
      i. YES: (9) Update Work Order CLOSED
      ii. NO: (6) Possible to complete/correct information?

6. Possible to complete/correct information?
   a. The Supervisor or WMC needs to reassign the WO to the Technician.
   b. This notification can be provided/given either by a 'Workflow' function within the CMMS, or a telephone call or e-mail to the Technician. The requirement may be that the Technician returns to the site or the location of the work
      i. YES: (7) Update/correct/complete information
      ii. NO: (8) Update WO REPLAN or RESCHEDULE

7. Update/Correct/Complete information
   a. The Technician may need to return to the site or workplace and record the required data. This may be as a result of incomplete or inaccurate information collected at the time of the original work. Therefore, it could be that additional data may need to be recorded at the time of this return visit, if proper meaning of the status of the plant is to be made
   b. Next Step: (2) **Error! Reference source not found.**

8. Update WO REPLAN or RESCHEDULE
   a. The Supervisor or WMC staff should update the Planner or Scheduler via the CMMS communication system, or by telephone or e-mail, for the change in status of the WO, and update the WO status in the CMMS
   b. The Supervisor or WMC staff should update the CMMS with known relevant information as the official record of the issues, events, communications, and decision-making associated with this WO. The details will be essential in any future investigations or audits of the work, as well as being useful to other stakeholders, including those leading capital funded projects
   c. Next Step: (8) Work Request Procedure

9. Update WO CLOSED
   a. If the work involved the replacement of assets that include a warranty cover by a third-party, the CMMS needs to be updated to reflect this, and any affected stakeholder(s) informed;
   b. Depending on the configuration of the CMMS and the requirements of the contract, a Work Order 'closing' step may be a time-lapsed automatic status change, performed by the CMMS;
   c. Next Step: END

10. Resource Accounting
    a. The status and availability of the WO information and data is made available to the appropriate teams via an automated CMMS 'Workflow' function;
       i. If no 'Workflow' function is available, the WMC Supervisor should ensure that the relevant stakeholders are made aware of the availability of the information in the WO;
    b. The Stakeholders may include:
       i. Financial Team
       ii. Asset Management Team
       iii. Quality Assurance Team
       iv. Capital Projects Team
       v. KPI Performance Reporting Team

7.0 ATTACHMENTS

1. Work Closeout Procedure Flowchart

Attachment 1 - Work Closeout Procedure Flowchart

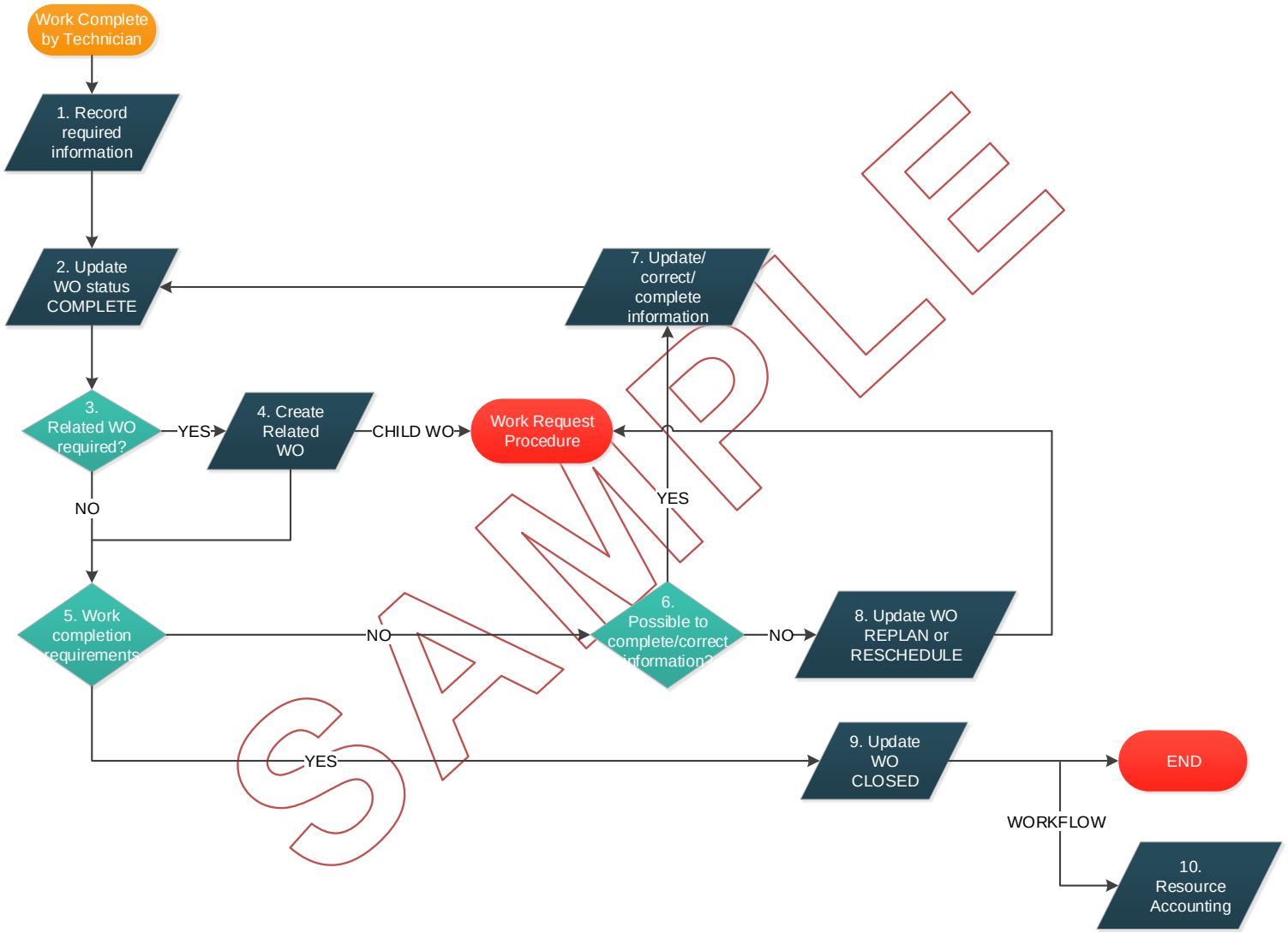

Figure 2: Work Closeout Procedure Flowchart