EXPRO National Manual of Assets and Facilities Management

Volume 7, Chapter 2

Requesting, Prioritizing, Planning and Scheduling Work Procedure

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1.0 PURPOSE

The purpose of this procedure is to guide the Entity client through the steps of work control, specifically requesting, prioritizing, scheduling and planning work.

An efficient and effective Work Control process is essential to facilitating the continuous improvement of a maintenance contract, away from a predominantly reactive operating model to a more effective Intelligent model. This document will assist the Entity client and their maintenance contractor to understand the pressures and complexity of Work Control, and thus help to inform of contractual requirements and the expectations necessary to allow for improvements.

2.0 SCOPE

Whilst this document is necessarily comprehensive, an effective Work Management Center team will be skilled in rapidly complying with all the steps and adjustments needed to meet their various responsibilities and workload. The range of unplanned work requests that need to be prioritized, planned and scheduled around the more baseline planned maintenance operation requires discipline and an understanding of the holistic stakeholder environment if customer satisfaction is to be achieved profitably within contractual requirements.

Though generic, this document attempts to illustrate the various expected scenarios and tasks, from contractual to technical/sector specific, thus acquainting the reader with examples of how the process outlined can be applied and tailored to meet their specific needs. To achieve this, this document provides high-level flowcharts within the main text, followed by more detailed flowcharts and a step-by-step narrative in the Attachments Section.

The guidance provided here is intended for application within a hard services maintenance environment, though its principles can also be applied to the soft services environment.

This document resides within the context of several relevant references and interdependent procedures. The documents stated in Section 4: “References”, should be consulted.

3.0 DEFINITIONS

Term	Definition
Automatic Systems	General term for remote monitoring systems such as Building Management System
Bill of Materials (BOM)	A list of the materials, spare parts and consumables that are required for a particular job
Help Desk	Part of the Work Management Center responsible for receiving, initiating, creating, and updating work requests and work orders
Job Plan/Task List	A detailed set of instructions to the Technician required to carry out the job. These may be repeatable (planned maintenance), or one-off (unplanned maintenance or project)
On-Call	A workplace status assigned to a person(s) to cover Out of Hours activities.
Out of Hours (OOH)	Definition of hours or days that reside outside of base contract hours – usually evenings or weekends when the demand for services is low, but response attendance may be needed.
Quick Work	Opportunistic work that can be carried out at the same time as the main task, without unacceptably prolonging the main task.
Intelligent Maintenance	A Maintenance system that utilizes the assets’ historical data, in order to optimize the maintenance operations between planned and unplanned activities (data-driven approach)
RAMS	Risk Assessments and Method Statements. A safety management document.
SOR	Statement of Requirement: a description of the requirement by the requestor. This may include a specified solution.
SOW	Scope of Work: a response to an SOR that describes the solution to meet the requirement.

Work Control	Work Control of operations and maintenance activities refers to the management of planning and execution of resources to meet the needs of planned and unplanned contractual and customer requirements.
Workflow	A feature and function within a CMMS that communicates and progresses an electronic record information to another decision-maker, or the next stakeholder.
Acronyms	
BMS	Building Management System
CMMS	Computerized Maintenance Management System
HSE	Health, Safety and Environment
KPI	Key Performance Indicator
PDA	Personal Digital Assistant
PM	Planned Maintenance
POWRA	Point of Work Risk Assessment
WO	Work Order
WR	Work Request

Table 1: Definitions

4.0 REFERENCES

- National Manual for Assets & Facilities Management – Volume 2: Asset Management
- National Manual for Assets & Facilities Management – Volume 5: Operations Management
- National Manual for Assets & Facilities Management – Volume 6: Maintenance Management
- National Manual for Assets & Facilities Management – Volume 7: Work Control
- National Manual for Assets & Facilities Management – Volume 9: Contracts Management
- National Manual for Assets & Facilities Management – Volume 11: Quality

5.0 RESPONSIBILITIES

Role	Description
(Assigned) Planner	Responsible for planning a specific job
Operations Manager	Supervisor's Line Manager who may have line management responsibility for the Work Control Management Team (depending on the organization structure).
Scheduler	Responsible for the Work Order Schedule and may be consulted by various people to solve a scheduling problem.
Supervisor	Responsible for confirming urgent decisions made by Technicians. They also assist non-technical personnel such as the CMMS Operators. In this context, 'Supervisor' refers to both the WMC Supervisor and Technician's Supervisor in the capacity of decision-maker.
Technician/Technical Operative	Responsible for responding to unplanned work, and carrying out planned and instructed work of a technical nature.
Work Management Center (WMC)	Consists of Help Desk and CMMS administrators and operators, scheduling, and planning staff. These may all be in same office or building. It is the central team responsible for Work Control.

6.0 PROCESS

6.1 Work Control Overview

6.1.1 Work Control and its Function

Work Control is an office-based activity that includes planning and scheduling of work, directing the technical workforce to successfully complete all work, and managing immediate, short, medium, and long-term inquiries.

Work Control involves:

- Receiving inquiries and instructions
- Work communication and notification
- Clarifying and confirming requirements
- Assessing contractual obligations of work
- Assigning priorities to work
- Estimating available and required resources
- Arranging permissions and resources
- Instructing work to commence and monitoring until completion
- Continually adjusting work following new inquiries and instructions.

Work Control can either be centrally controlled or delegated to technical operatives and supervisors. Best Practice entails that the Work Control decision-making is centrally controlled by a Work Control Team, and not delegated to technical operatives, even though these operatives are often the first people to receive the work request.

The requestor is directed to submit their work request directly to the Help Desk or central decision-making team as this is a more efficient approach. Processing of work request types follow the same methodology with the only difference being how the request is initiated, and the type of request such as planned and unplanned, automated by Help Desk or Technician, Out-Of-Hours or standard hours.

Workflow is a term used to describe the ability within a Computerized Maintenance Management System (CMMS), to electronically route a Work Order to the next level or relevant stakeholder. Prompt workflow actions are necessary, so as not to delay the progression of a Work Order, which may have to pass through various stakeholders such as Health & Safety, planning, scheduling, spares procurement and assigning, and client authorization. This transfer of information and the process of acquiring approval from the relevant stakeholders is best managed through a Workflow function within a CMMS, as timing and communication can easily be tracked through the life of the Work Order.

It is not uncommon for a Help Desk representative to receive a request to carry out a task that is outside of the contract. A ‘Work Request’ becomes a Work Order once it is confirmed that it resides within the scope of the contract. For work that resides outside the scope of the contract, but is something that the contractor is able and willing to undertake, a Work Request becomes a Work Order after the requirements for additional work have been accepted as a funded or official work instruction.

Examples of Work Requests that are outside the maintenance contract include requests to help with moving a printer, helping to assemble a poster display, or assisting with the mobility of a patient. Clients making, and contractors agreeing to, these types of work requests need to recognize the risk of impact on KPI compliance, as well as wider legal and contractual infringements.

6.1.2 Requesting Work

The advice presented here on requesting work resides within the context of several related documents within Volume 7 of the National Manual for Assets & Facilities Management.

The request initiation should be directed and monitored at an authorized and recognized center within the organization, such as a Help Desk within a Work Management Center (WMC). Requests made via informal routes should not be received or processed.

Assessment and execution of the work request needs to be carried out in the context of the operational environment, asset management and contractual obligations.

Requesting work normally relates to both planned and unplanned work that is expected, predictable, repeatable, and included within the operations and maintenance contract. It refers to work that resides both within 'normal hours' and 'Out of Hours' (OOH).

Requesting work may also relate to additional work such as 'Small Works Capital Investment Projects' and 'Life Cycle Replacement projects funded separately by the client, tenant and/or stakeholders to enhance, improve, sustain or rehabilitate the facility. Additional work may 'add' to the asset count (such as more tele-conference screens and more air conditioning units) which in turn may put an additional load on the asset operations and maintenance management of the 'contracted' resources and hence on performance.

These additional assets can complicate the contractual operations and maintenance work if the installations use non-standard or specialist equipment due to the difficulty in sourcing spare parts or the contracted team lacking the appropriate skillset. Additional works can increase an operation's workload if the asset or system is not networked to the Building Management System (BMS), as this increases the effort under Facility Surveillance. Assets added to a facility after the contract has been awarded are likely to have their operations and maintenance funded differently, especially if their installation was funded by a different stakeholder. This can have implications on meeting KPIs and customer expectations.

Requesting work comes from a variety of sources, including the Entity client, Managing Agent, occupants, users, H&S audits, external audits and remedies arising from Planned Maintenance. The Work Control Team becomes aware of these work requests through a number of routes, typically automated BMS alarms, the Help Desk or internal management instructions.

Work requests have inherent priorities or expected timescales. An urgent piece of work disrupts the planned work and therefore it is important to review the request promptly and assign it the correct priority.

Potentially unplanned work can be identified in several ways, but needs to be accepted and redirected via the Work Request Management flowchart. In each of the following situations, the work will have been confirmed and accepted as an emergency having followed the high-level, unplanned/disruptive work, decision-making flowchart.

It is necessary to have the appropriate communication methods available for each level of expected urgency. From building custodians and duty managers, and from hospital staff to senior leaders, this requires awareness training for those likely to make these types of requests (work requests that are considered emergencies are best reported by telephone). Also, for example, night-shift security staff should be advised that reporting a water leak by e-mail in the middle of the night is not likely to be responded to in a timely manner and hence further damage to the facility is likely to occur.

Illustrated below is a high-level summary of the route followed by a work request which is subsequently converted to a Work Order:

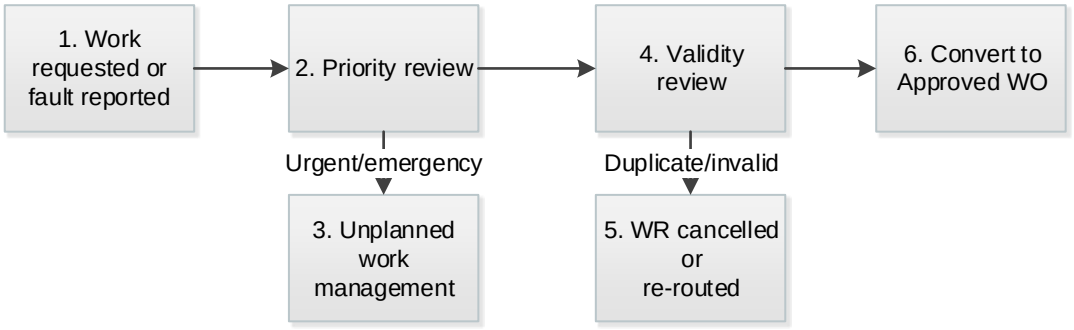


Figure1: High Level Summary of Process by which Work Request Transitions into a Work Order

Step 1: Work is requested, or a fault is reported. The fault reporting may be from automatic monitoring systems such as BMS, or by the technical team or building occupant.
Step 2: The request or fault is assessed for urgency.
Step 3: Urgent or emergency work is immediately rerouted to the unplanned work management process.
Step 4: Non-urgent or non-emergency work is assessed for validity. A work request needs to be unique, and it needs to be within the remit of the maintenance service provider.
Step 5: Invalid requests are routed back to the requestor as cancelled, or re-routed as appropriate (such as to another team or contract).
Step 6: Valid, unique, and non-urgent Work Requests are converted to an approved Work Order that can then enter the planning and scheduling process, as appropriate.

6.1.3 Prioritizing Work

Prioritizing work refers to the activity of deciding whether the work is an emergency, urgent or routine, and responding to and processing the request to the next valid step.

Emergency and urgent work is usually categorized as ‘unplanned work’ because it disrupts or displaces work that is planned, and already likely in progress. For a contractor engaged on multiple sites and contracts, this may necessitate the reassigning of resources and/or putting on hold a work activity for a separate client.

The contract requirements relating to emergency work usually entail that the contractor only ‘make safe’, rather than ‘repair’. For this reason, it is common that, once an emergency is made safe, a ‘Child’ routine Work Order is raised and related to the emergency Work Order for the purposes of carrying out the repair.

Urgent work may not necessarily be motivated by risk of injury to personnel or damage to the facility. It may be made urgent by other factors, such as the seniority of the requestor or risk to reputation that the work or fault presents. For example, a request to restore the electrical power to a one-person office is likely to be urgent if that person is a senior member of the organization. Another example is the repair of an out-of-service AC at customer-facing, or public areas, compared to non-public areas where the reputation of the organization is at stake. The contractor needs to balance the pressure put on them to react to work requests motivated by non-technical triggers, as this can displace work that is more urgent, from a technical perspective. Redirecting resources away from work that has a high technical risk will increase the risk of damaging the plant which could subsequently lead to dire consequences.

Work that is considered to have a lower priority can be more easily planned. Work requests for ‘routine’ work may be more easily scheduled with other work activities, such as Planned Maintenance.

Effectively prioritizing work is based solely on the description of the fault or situation. For this reason, it is important to extract from the requestor the most objective description of the fault or situation possible. For example, a ‘large water leak’ is not very helpful in determining the priority. Requestors may also be tempted to exaggerate the description in a bid to elicit a prompt response for faults that may not necessitate a repair.

For example, in an emergency, the response is not usually to repair the fault, but to ‘make safe’ the situation, or fault. This would be outlined in the Service Level Agreement.

Factors Affecting Work Prioritization

Prioritizing work is influenced by several factors, including, but not limited to:

- Safety
- Regulations
- Customer deadline
- Energy efficiency
- Environmental impact
- Performance improvement
- Durability
- Lean works
- Customer/user experience, reputation, public image
- Operational criticality
- Contractual targets.

It may be decided that it is more important to achieve KPI compliance on high priority work than lower priority work. From this example, the person(s) making the scheduling decisions need to have a clear understanding of the priorities of the organization, the client, and the contract.

Requests that fall outside the contractual obligations usually have key differences to work ‘under contract’. For example, they are likely to be chargeable, be much less time-constrained and (depending on size) the delivery method may be outsourced. These are usually favorable requests that are often a desirable additional income generator for the contractor.

Priorities are usually defined in the contract both in terms of categories and timescale. The most commonly used categories are ‘Emergency’, ‘Urgent’ and ‘Routine’. These categories also need to have a timescale for response or resolution. For example, an ‘Emergency’ situation may have a KPI to ‘make safe’ within one hour. An ‘Urgent’ situation may have a KPI requiring that the location of the fault be attended within four hours and that the fault be repaired within an additional four-hour timeframe. A ‘Routine’ may have a KPI to repair a fault within ten working days. To achieve consistency in applying these categories across a multi-site contract and various teams, it is useful to agree to a range of examples as guidelines.

An ‘Emergency’ may be defined as a situation where there is imminent or actual risk of injury to people, or damage occurring to the facility. An ‘Urgent’ situation may be defined as a situation having the potential to cause injury to people or damage to the facility. It includes consequential damage when the fault is not tended to within a brief period of time, typically within 12 hours. A ‘Routine’ priority is a situation that affects the comfort of people, or the efficiency of an engineered systems operation.

Examples of work requests and their corresponding priorities that typically are included in a maintenance contract are given below. The number of categories and definition of response and completion times are specific to each contract, as stated in the Service Level Agreement.

Priority category	Response (example)	Function Resolution Target Times (example)	Example of work
Emergency/ Critical	10 minutes	3 hours	Lift entrapment
			Water leak through ceiling >5 liters per hour
			Electrical socket sparking
			Fire door jammed or blocked
			Fire/smoke detector indicating fault
			Flickering/failed light fitting (only one within space)
			Bursting of water main/pipes/sewage pipes
			Buildings are not intrusion secure
			Fire alarms that cannot be reset
			Fuel spillage
Urgent	4 hours	24hours	Potential hazard (such as roof sheet flapping)
			Carpet tile or other floor trip hazard
			Unhygienic restroom
			Flickering lights (1 light of 2 lights within space)
			Overflowing toilet causing wet floor
			Medium leak of domestic water valve
Important	7 hours	7 days	Door handle detached from door
			Damage to internal wall less than one sq. meter
Routine	48 hours	28 days	Minor concrete or roadway repairs
			Dripping sink tap
			Flickering light fitting (less than one within a group of ten)
			Overflowing toilet draining safely
			Door closers not working or damaged
			Curtain rails, blinds and fly screens not working

Table 1: Examples of Work Request Priorities

The threshold for performance reporting, such as the task percentage completion times assigned to withholding fees, vary from contract to contract. The appropriate volumes and chapters should be referred to as necessary.

To avoid having work request priorities downgraded by contractors (to allow them more time to complete their tasks within the KPI compliance timeframe), maintenance contracts should clearly define each priority category and the client should audit the contractor on a periodic basis.

(Refer to National Manual for Assets & Facilities Management – Volume 9: Contracts Management and Volume 11: Quality for further information).

6.1.3.1 Emergency and Urgent Work (i.e., Unplanned/disruptive Work)

Unplanned work is usually work where processing via the planning and scheduling process should be prioritized (cannot or should not be delayed or postponed). The unplanned/disruptive work process defines the sequence of events that takes place to ensure that the correct and complete response is implemented when a potential emergency, or urgent situation is identified. This will confirm the urgency of the work, resolve any immediate emergencies, and ensure that work is responded to in the most appropriate manner.

A high-level summary of the prioritization route that urgent/emergency work follows, is illustrated below:

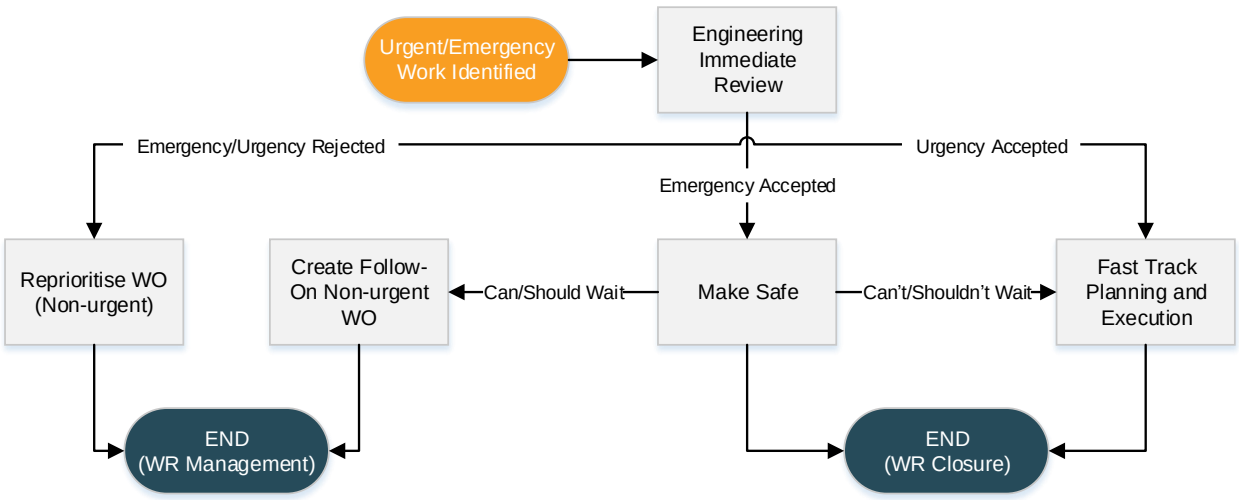


Figure 2: Prioritizing Urgent/Emergency Work Process Flow

As depicted in the figure above, the immediate action of an emergency response is to 'make safe'. The work is subsequently reduced in priority to 'urgent' or 'routine' as it proceeds through each step of the process shown above. Contractually, this is managed through the CMMS through the 'parent and child' Work Order structure. This allows for the response times for the emergency to be recorded accurately and separately to the follow-on repair.

An example of an emergency Work Order triggering the creation of a 'child' routine Work Order, would be a water leak affecting a tiled corridor in a dense foot-traffic area. The emergency Work Order would require attendance at the location within a very short period of time, from when the Help Desk was notified of the situation. The emergency work in such a scenario would typically require that the operatives close off the corridor and man the location until a spill kit (or similar), can be brought to the location to contain the impact. The source of the leak might also be located, and the water supply isolated. Depending on the location and the extent of the leak, it may be possible to partially reopen the corridor to limit disruption to the building occupants. A 'child' Work Order would then be raised to facilitate the repair work required for the pipework, and consequential damage to the fabric. This will also include the authorization for the purchase of materials, and Out of Hours work, as necessary.

Note that the emergency requests may need to bypass some formal steps, for example:

- Approved Risk Assessment/Method Statements (RAMS) is replaced by a Point of Work Risk Assessment (POWRA)
- Purchase of authorized parts is carried out by the Technician, rather than by the Purchasing team
- Extended working hours do not require pre-approved overtime.

Processes for these expedited permissions and safety checks need to be in place if emergencies are to be immediately and effectively responded to within the contract's established time-constraints and parameters. For example, POWRA must be available to the technical team attending the emergency, and the staff must be suitably trained.

Also, note that some emergency or urgent work requests need to be responded to 'Out of Hours'. When the technical operatives attending to the request are presented with a need for additional resources, such as the purchase or hire of equipment such as temporary pumps or generators, Out of Hours escalation will be required. OOH contact with decision-makers who might not work for the maintenance contractor, is needed in such circumstances.

Depending on several factors, it is possible that the emergency work request is responded to without an active Work Order being raised, especially when the work request has an urgent turnaround time constraint. In these situations, it is common practice to raise the Work Order as soon as possible, typically within an hour of the request. Raising a Work Order for Out-of-Hours requests can occur 12 hours after the request is made, simply because the work control team adheres to a day-shift, work schedule.

6.1.3.2 Routine Work

Work Requests that are considered to have a routine priority can be sent to the Help Desk via e-mail, the on-line portal, or telephone. It is good practice to check these e-mail and portal requests twice per day to assess their priority, and to ensure the request details are complete.

Routine work requests that are not constrained by immediately available resources can be assigned to the most appropriate technician. Depending on the contract details, it may be possible to schedule the routine work beyond the default KPI timeframe if directed by the requestor or end-user.

Routine work requests are also most likely to be superseded by more urgent work requests.

6.1.4 Work Scheduling

Work Scheduling is only performed on approved Work Requests (i.e. Work Orders).

Work Scheduling is influenced by several factors, including:

- Contractual targets
- Requirements gathering
- Site-specific IDs and permits
- Funding confirmation (which can be dependent on receiving estimated costs from external contractors for which there may be more than one funding source)
- Availability of resources including skilled resources.

Work requests justifying a 24-hour or similar urgent timeframe typically require the reviewing and rescheduling of the workforce's workload, twice per shift. If forecasting is performed inaccurately, these higher priority Work Orders will cause planned work to be postponed.

Adoption of electronic technology extending to Personal Digital Assistants (PDAs) for operations can streamline the assignment of emergency or urgent work. For example, if a building has three electricians working on planned or routine priority maintenance (work that could be interrupted) and the Help Desk receive a call to resolve a sudden lighting outage in a particular area, the Help Desk Operator can electronically assign this task to one of the electricians, who in turn can 'accept' the instructions via the PDA and, immediately tend to the issue.

Alternatively, the Help Desk Operator can send the request for assistance to all three electricians and the first to 'accept' the work via the PDA communicates this electronically to the other two electricians and the Help Desk Operator (and others with visibility on this information). The information available at the time would suggest that this is a low-skill repair, probably requiring an electrical power circuit breaker to be reset, and hence all levels of electricians would be included in the request. The electrical supervisor may ignore the request because they are aware that the required skillset is available. If the Help Desk call is assessed by the Help Desk Operator as requiring a specific skillset (such as authorization to work on a particular system such as UPS), the request for help would only be sent to those recorded within the CMMS, as having the required expertise and permissions.

6.1.4.1 Guidelines for Forecasting and Scheduling Work against Available Hours

Work schedules should be well-coordinated with the relevant stakeholders with reasonable notice. The general practice of work scheduling is to outline the workload of each employee for a certain period in the future (typically six weeks). For example, it is possible to be certain that an employee will be carrying out a particular number of jobs six weeks from now, and that this should occupy approximately 50% of their working day. As time goes by, more planned work can be added to this employee's workload without overloading them. It is good practice to always allot spare time to each employee to accommodate for any unplanned/disruptive work that arises. Any available spare time that is not allocated to urgent requests is normally reserved for other contractual work such as remedial Work Orders, or assisting other employees.

It is necessary to have an accurate estimate of the amount of time each task takes so that the Scheduler can utilize available employee resources optimally without overloading them, as overloading an employee can result in compromised KPIs. An estimate of the amount of time required by each task is made by requesting the employee to align their time records with the correct activity so that the information available to the Scheduler is accurate. For these reasons, adoption of Best Practice 'Work Closeout' and 'Maintenance History' procedures are recommended.

Work that is of a repetitive nature such as Planned Maintenance tasks, usually have considerable historical data available that helps inform the Scheduler of how much time needs to be allocated to a given task. The Work Control Team needs to have the most accurate information available for supporting activities such as travel, and collecting materials from the supplier.

Another task performed by the Work Control Team is requesting and scheduling access for work that falls within the contract and is measured as a KPI. The Service Level Agreement within the contract may detail a minimum number of access request attempts to be performed, before the contractor is held liable for failure to carry out the work within the KPI timeframe. It is recommended that the Scheduler records all attempts to coordinate access in the CMMS system, so that the correct 'failure code' can be applied, and escalation through the CMMS can occur, provided that the system is suitably configured.

Work requests that fall outside of contractual obligations will likely be scheduled depending on a wider variety of factors, including confirming requirements, confirming funding, mutually-agreed schedule, and resource availability. If the work is to be outsourced, the availability of external contractors needs to be known with adequate certainty, as this aspect may be incorporated into the bid requirements. Tendering of work may have to comply with certain financial rules. For example, projects with a low estimated value may be permitted to be assigned to an external contractor without a competitive tender. This contrasts with work that has an expected value in excess of a certain figure (defined within the contract) being required to be tendered by several companies for competition and value-for-money purposes. Further complexity in the scheduling of work that is outside the contract arises if separate parts of the work are being funded or carried out by different teams (such as the reconfiguration and rehabilitation of a part of a building where the air conditioning installation is funded by the Facilities Department; the furniture is provided by a central team; the network system is updated and reconfigured by an internal IT team and the decoration is being outsourced to a contractor not involved in any of the aforementioned areas). Stakeholder requirements, funding confirmation, and coordination of on-site activities can collectively affect the scheduling of the work.

Depending on the size and complexity of the maintenance contractor's business. The availability of skills and resources may be communicated to the Scheduler through the CMMS. If the business is small and the contract is relatively simple, the Scheduler might be familiar with each member of the technical team, and can then assign them tasks based on their skillset. For larger contracts (such as a large national contract), it is likely that the Scheduler manages a large pool of technical staff, that they are not familiar with. Hence, the skillset details of the technical team in the CMMS needs to be accurate and complete so that the Scheduler can assign members of the team based on need, ability, availability, and location, in an effort to ensure successful completion of the work.

A high-level summary of the steps involved in scheduling approved Work Orders, is illustrated below:

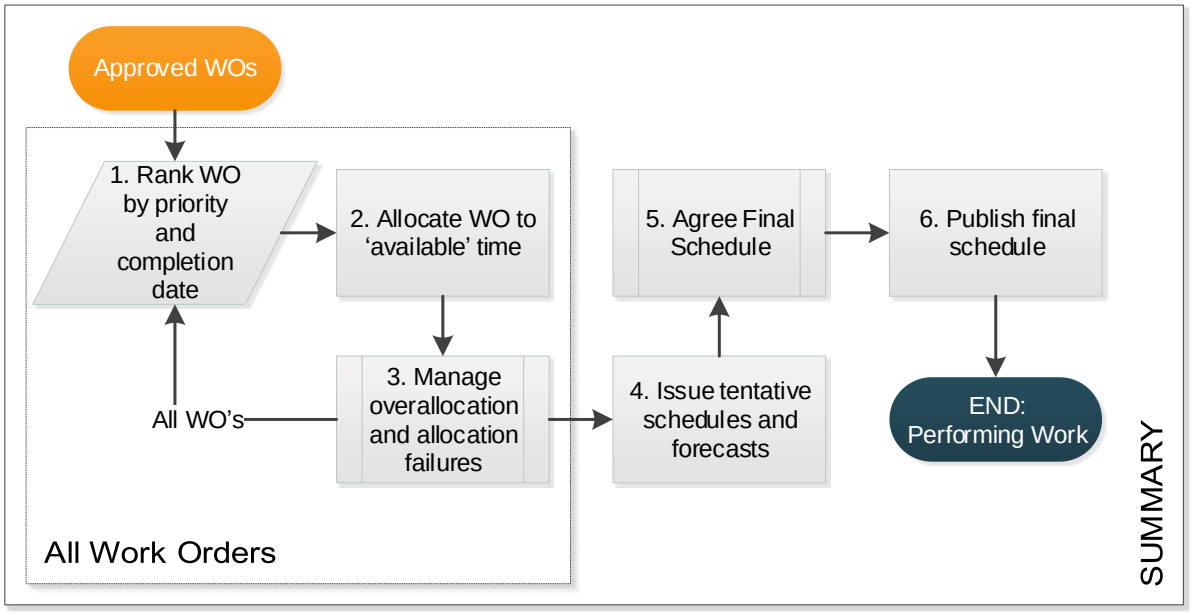


Figure 3: Scheduling Approved Work Orders

Work Scheduling High-Level Steps

Step 1: WOs for a 'Schedule Period' are ranked and addressed, one at a time.
Step 2: WOs are tentatively allocated an 'available' time slot.
Step 3: WOs/Technicians risking over-allocation are 'managed' or 'recycled', to limit risks to the schedule.
Step 4: A tentative schedule is periodically issued to, and reviewed by the stakeholders.
Step 5: Following the review process, the Schedule is agreed.
Step 6: The Scheduler publishes the 'final' Schedule, giving way to the Performing Work process.

6.1.5 Scheduling Template

Scheduling guidance has been provided in a previous section, and is supplemented with flowcharts in the Attachments Section of this document.

Effective management of work requisition, prioritization, scheduling, and planning, improves with experience and is a constant, high-pressure activity. A checklist template is provided in the Attachments Section outlining a list of important, commonly asked questions that a Work Management Center supervisor or manager needs to address on a once-a-day, twice-a-day, or weekly frequency, in order to provide consistent and effective service.

6.1.6 Work Planning

Work planning involves the understanding of the requirements, arranging for all the resources and permissions to be identified and provisionally arranged, so that the work can be scheduled once authorization has been granted.

Work planning is a combination of technical, logistical and administrative activities that ensure everything is in place for the work to start, progress and be completed, according to plan. Work scheduling is the activity of identifying the best time-period in which to carry out the planned work.

Work that requires planning can be initiated by a variety of triggers, including routine planned work, ‘Help Desk’ reactive work, or approved Work Orders that may have previously been placed ’pending’ (‘on hold’).

If the Work Order is for routine planned work, it is likely that the resources required are already in place, such as:

- Suitably skilled technical staff
- Applicable documentation such as Job Plans or Task Lists and Risk Assessments
- Site attendance permission
- Knowledge and availability of spare parts.

Conversely, new situations stemming from new contractors, a new site, or a specific request for unique work will likely require more planning, because the above aspects are not known or arranged. Identification of suitable external services may also be necessary, such as a contractor specialized in a specific area of expertise. The Work Planning activities, from determining the Scope of Work through to having the Health and Safety requirements being concluded, shown in Figure 4 below as steps 3 to 7, can be summarized as the Estimating Work phase within the Work Planning procedure. For guidance on Estimating Work, refer to the National Manual for Assets & Facilities Management – Volume 7: Work Control document ‘Estimating Work’.

A high-level summary of work planning steps for work planning is illustrated below:

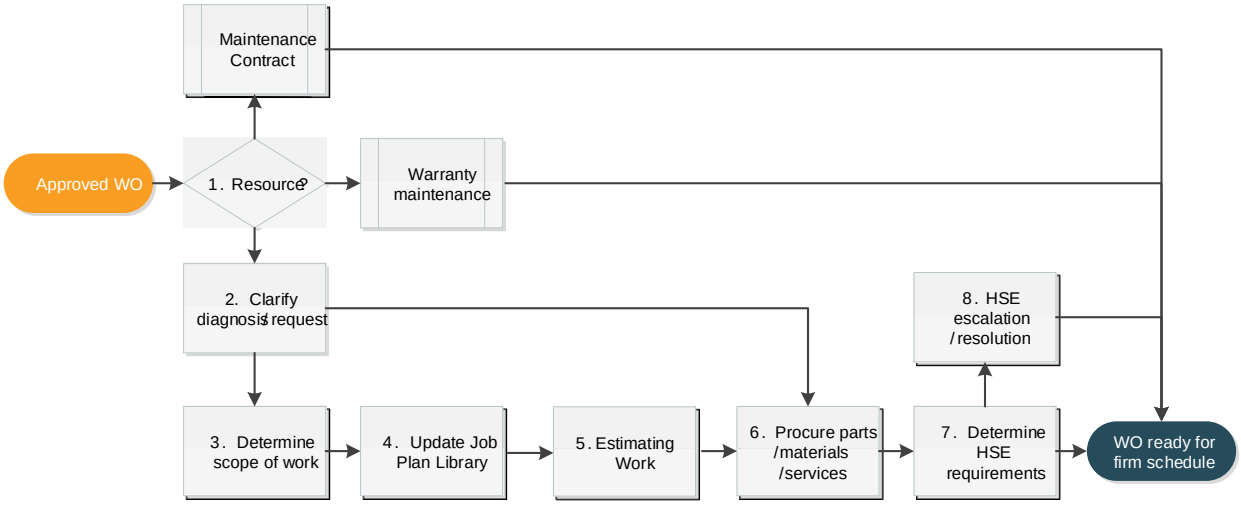


Figure 4: Work Planning Steps for Work Requests

Work Planning High Level steps

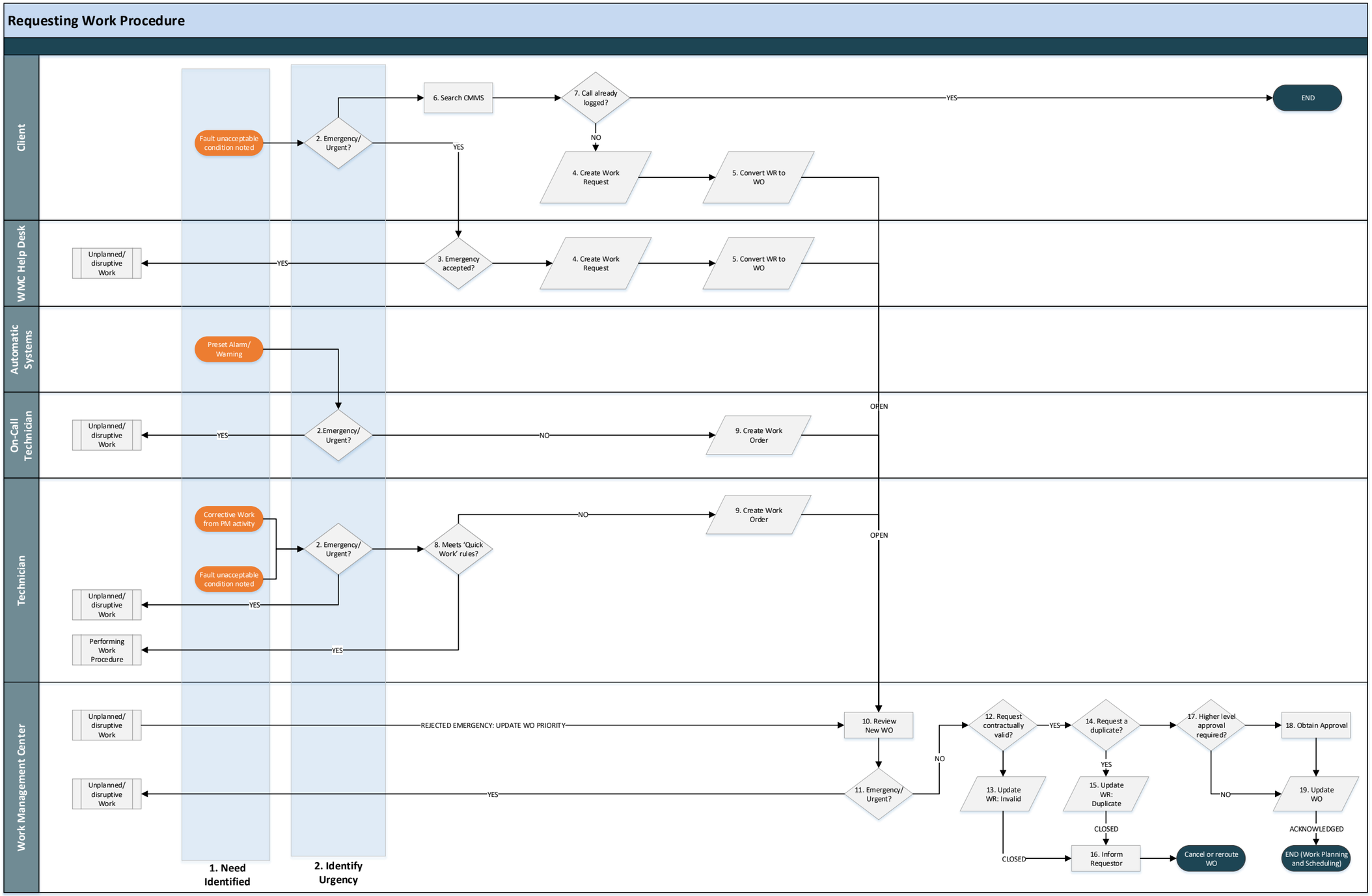
- **Step 1:** The appropriate resourcing of approved Work Orders is identified
- **Step 2:** The complexity of requirements is clarified, with requests not requiring detailed planning progressed to resource allocation
- **Step 3:** Work Orders requiring planning have the details of their Scope of Work confirmed
- **Step 4:** New job plans/task lists and other documentation is created
- **Step 5:** Estimating Work Procedure converts inputs to requirements for procurement
- **Step 6:** Procurement authorization is obtained for parts, equipment, and services
- **Step 7:** HSE requirements are determined
- **Step 8:** HSE requirements are escalated if necessary, prior to scheduling and/or Performing Work

The output from the work planning procedure is a Work Order, with all the necessary resources and permissions identified and approved, and ready for scheduling.

6.2 Procedures

6.2.1 Requesting Work

6.2.1.1 Process Flowchart



6.2.1.2 Detailed Procedure Steps

1. Need Identified

a. The need for work is identified. This may be done in several ways, such as :
   i. Noted by the client or client stakeholder
   ii. Automatically, from systems such as a Building Management System (BMS)
   iii. From the Technicians
b. Next Step: 2 Identify Urgency

2. Identify Urgency

a. The level of urgency required is to be decided upon.
b. Next steps: These will differ slightly depending on the identification/notification route for the work request:
   i. Work identified by the client or client stakeholder:
      (1) YES Work identified is Urgent or an Emergency: 3 Emergency Accepted?
      (2) NO: Work identified is not urgent: 6 Search CMMS
   ii. Work notified via automatic systems:
      (1) YES: Work identified is Urgent or Emergency: EXIT to Unplanned/disruptive Work Process
      (2) NO: Work identified is not urgent: 9 Create Work Order
   iii. Work identified by Technician:
      (1) YES: Work identified is Urgent or an Emergency: EXIT to Unplanned/disruptive Work Process
      (2) NO: Work identified is not urgent: 8 Meets 'Quick Work' Rules

3. Emergency Accepted

a. The WMC will ascertain the nature of the fault, or work required and accept or reject the urgency. The WMC Help Desk will use the laid down criteria to support their decision to accept or reject the urgency of the reported fault or required work.
b. Next steps
   i. YES: EXIT to Unplanned/disruptive Work Process
   ii. NO: 4 Create Work Request

4. Create Work Request

a. The WMC Help Desk will create a Work Request based on the details provided by the requestor/caller. (The Work Request will be created using the system agreed for the site/facility – this may be accomplished via CMMS, paperwork requests or e-mail, or any other system)
   i. The WMC Help Desk will complete the required fields/sections of the work request to ensure that adequate information regarding the fault or work request.
b. Next Steps: 5 Convert Work Request to Work Order
c. Data Requirements – minimum information required, for example:
   i. Asset name
   ii. Location
   iii. Contact details of the Requestor
   iv. Priority
   v. Date and time of notification
   vi. Appropriate completion date

5. Convert Work Request to Work Order

a. The Work Order is created
b. Next Step: 10 Review New Work Order
c. Data Requirements – minimum information required, for example:
   i. Asset name
   ii. Location
   iii. Contact details of the Requestor
   iv. Priority

v. Date and time of notification
vi. Appropriate completion date

6. Search CMMS

a. Search the CMMS database to ascertain if the same fault or work has already been reported or requested.
   i. If the same fault notification or work request can be located, it should be possible to determine what progress has already been made, and act accordingly.
b. Next Step: 7 Call already logged

7. Call already logged

a. Any similar Work Request located in the search should be examined for duplicates to determine if the fault being reported or work being requested has already been created as a Work Request.
b. Next Steps:
   i. YES: END (note WR number for follow up if and as required)
   ii. NO: 4 Create Work Request

8. Meets 'Quick Work' Rules

a. Work identified by Technicians that is not expected to require parts, safety equipment, additional coordination, and which will not delay the core planned tasks can be classified as Quick Work. The Work Order should be created and all data recording requirements should be fulfilled before moving onto further work.
b. Next Steps
   i. YES: END (exit to Performing Work Procedure)
   ii. NO: 9 Create Work Order

9. Create Work Order

a. It should be possible for Technicians to indicate the exact fault or corrective work, although this may not always be possible, especially if further investigation is required.
b. Next Step: 10 Review New Work Order
c. Data Requirements – minimum information required, for example:
   i. Asset name
   ii. Location
   iii. Contact details of the Requestor
   iv. Priority
   v. Date and time of notification
   vi. Applicable completion date

10. Review New Work Order

a. Scheduler's review will cover type of work, asset, location, symptoms, and fault or work required, completion date and priority. This review will usually consider the highest priority order with the closest required completion, and/or response date/time first.
b. Next Step: 11 Urgent / Emergency

11. Urgent / Emergency

a. Urgent and emergency Work Orders should already have been re-routed to the technical team. In this step, the Scheduler is simply checking that an urgent or emergency job has not 'slipped through the net'.
b. Next Steps:
   i. YES: EXIT to Unplanned/disruptive Work Process
   ii. NO: 12 Request Contractually Valid
c. Data Requirements: The WR/WO priority should be updated to reflect urgency.

12. Request Contractually Valid

a. Work may be requested, or faults noted, that do not come under the remit of the maintenance contract. These Work Orders will be cancelled, or rejected and re-routed if required to the appropriate stakeholder using the approved procedures.
   i. 'Still to be formalized' agreements to amend the contract may also exist. It is also possible that the Contract Manager may be inclined to include some tasks 'gratis' for their client.
b. Next Steps:
   i. YES: 14 Request a Duplicate
   ii. NO: 13 Update WR: Invalid

13. Update WR: Invalid

a. This will allow the requestor to obtain feedback about their request.
b. Next Step: 16 Inform Requestor
c. Data Requirements (typically):
   i. Work Order status
   ii. Comments/ Notes/ reasons/team rerouted to
   iii. Closure Date/Time
   iv. Name of the individual closing the WO

14. Request a Duplicate

a. The Scheduler may need to contact the requestor of both the work requests to confirm duplication
b. Next Steps
   i. YES: 15 Update WR: Duplicate
   ii. NO: 17 Higher Level Approval required?

15. Update WR: Duplicate

a. This will allow the requestor to obtain feedback about their request.
b. Next Step: 16 Inform Requestor
c. Data Requirements (typically):
   i. Work Order Status
   ii. Comments/Notes/reasons/duplicate existing WO number
   iii. Closure Date/Time
   iv. Name of individual closing the Work Order

16. Inform Requestor

a. There should be laid-down guidelines about work request feedback to clients and client stakeholders
b. Next Step: END

17. Higher Level Approval Required?

a. Some work needs additional approval before it can be accepted for planning and scheduling. This may include work in regulated spaces and/or restricted areas, or work estimated to cost more than a specified limit.
b. Next Steps
   i. YES: 18 Obtain Approval
   ii. NO: 19 Update WO: Acknowledged

18. Obtain Approval

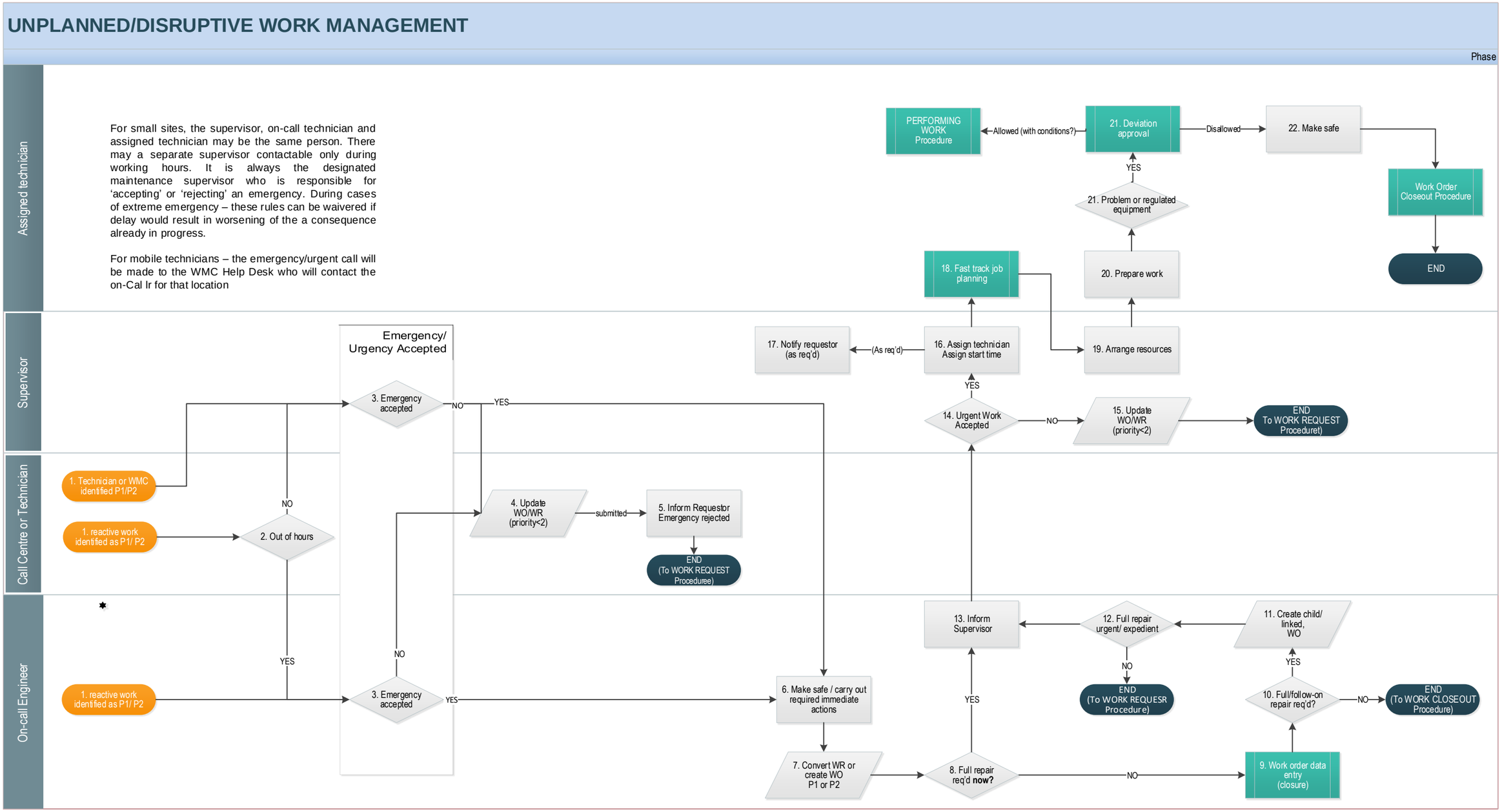
a. There may be specific documentation to be completed and specific signatures to be collected.
b. Next Steps: 19 Update WO: Acknowledged
c. Data Requirements:
   It may be necessary to update the WO status to a 'PENDING/HOLD' status, while approval is obtained.

19. Update WO: Acknowledged

a. This is the final stage prior to the planning and scheduling processes. Once the WO is acknowledged, planning can begin.
b. Next Step: END (Planning and Scheduling Processes)
c. Data Requirements:
    i. The Scheduler should update the WO, to ensure that there is enough information to start planning.

6.2.2 Prioritizing Work (Unplanned/Disruptive)

6.2.2.1 Process Flowchart



6.2.2.2 Detailed Procedure Steps

1. Urgent Work or Emergency Situation Identified

a. An emergency situation or urgent work may have been noted:
   i. By a client or client stakeholder, who reports it to the Help Desk or WMC, who subsequently accepted the situation as an emergency or urgent
   ii. By a Technician.
   iii. By automatic alarm systems such as a BMS alert to the control room, or via mobile/cell phone or PDA.
   Note: On small sites, the on-call Technician may also be the Supervisor.

b. Next Steps:
   i. For Call Centre identified potential emergency/urgent work: 2 Out of Hours
   ii. For Technician or WMC identified potential emergency/urgent work: 3 Emergency Accepted
   iii. For on-call Technician identified potential emergency/ urgent work: 3 Emergency Accepted

2. Out of Hours

a. The person or team responsible for receiving OOH calls will be required to contact the appropriate personnel at the appropriate times.
   i. 'Out of Hours' reports may be referred to the on-call technician, who is either on-site, or can attend site. Reports made within normal working hours, may be referred to a Supervisor.
   ii. The Call Center may manage the calls from several sites which, operating under different contract conditions, may have differences in definitions of 'hours' and 'urgency'.

b. Next Step:
   i. YES: Out of Hours; contact the designated on-call Technician: 3 Emergency Accepted
   ii. NO: Within 'normal working hours'; contact the Supervisor: 3 Emergency Accepted

3. Emergency Accepted

a. A decision needs to be made whether to accept and confirm the urgency of the situation, and confirm if it truly requires emergency or urgent work, or if it requires routine work that should be routed through the work management processes of planning and scheduling, before Performing Work.
   i. During normal working hours, the decision to accept the work request as urgent or an emergency probably lies with the WMC Supervisor.
   ii. Outside of normal working hours, the decision to accept the work request as urgent or an emergency probably lies with the designated on-call Technician.
   iii. The Supervisor has to confirm whether the situation is truly urgent or an emergency, or if it is a routine Work Order/work request with a much lower urgency. The Supervisor may have to make this determination with limited knowledge/experience of the site/systems.
   iv. There may be a separate supervisor contactable only during working hours.
   v. For mobile Technicians – the emergency/urgent call will be made to the WMC Help Desk or Call Center, who will then contact the on-call Technician for that location.

b. Next Step:
   i. NO: work is not confirmed as an emergency or urgent: 4 Update WO/WR (Priority <2)
   ii. YES: work is confirmed as urgent or an emergency: 6 Make Safe/Carry out Required Immediate Actions

4. Update WO/WR (Priority <2)

a. If the emergency or urgent situation is rejected by the Supervisor or the on-call technician, the Work Order priority will need to be downgraded. The Help Desk Operator should be able to do this directly.

b. Next Step: 5

c. Inform Requestor Emergency **Rejected**
d. Data Requirements:
    i. Update priority field.
    ii. Reason for rejection as an Emergency.

5. Inform Requestor Emergency Rejected

a. The WMC or Call Center should inform the requestor as required.
b. Next Step: END – to Work Management Process.
c. Data Requirements (includes):
   i. Fault description/symptoms/work required
   ii. Location
   iii. Reason/explanation for rejection as an emergency/urgent

6. Make Safe/Carry out Required Immediate Actions

a. The Technician should carry out any immediate actions to contain or make the situation safe. This is generally only needed for emergency situations; urgent situations may not require any immediate actions.
   i. The out-of-hours staff should follow the escalation procedures to obtain additional resources or support, as required.
b. Next Step: 7 Convert WR or create WO

7. Convert WR or create WO

a. Once the emergency has been contained, the Work Order must be created to document the work and collect the Work Order history.
b. Next Step: 8 Full Repair Required Now

8. Full Repair Required Now

a. The Technician must decide if a full repair is required to be completed at this time.
   i. It may be possible that further work is required, which can wait.
   ii. If a full repair is required immediately, the Technician should continue under the same Work Order.
b. Next Steps:
   i. YES: 13 Inform Supervisor
   ii. NO: 9 Work Order Data Entry

9. Work Order Data Entry

a. Update the Work Order to reflect the current status, and work done so far.
b. Next Step: 10 Full/Follow-on Repair Required
c. Data Requirements (includes):
   i. Failure Code
   ii. Action taken
   iii. Labor hours
   iv. Parts used

10. Full/Follow-on Repair Required

a. The Technician decides if follow-on work is necessary and, if it is necessary or expedient to carry it out immediately.
   i. The follow-on work may include repair to collateral damage that was caused by the emergency, rather than a resolution of the equipment causing the emergency.
b. Next Steps:
   i. YES: 11 Create Child/Linked
   ii. NO: END (Work Closeout Procedure)

11. Create Child/Linked WO

a. This WO will effectively be a ‘child’ Work Order to the original emergency/ urgent WO, and must contain some link to the original work for reference.
b. Next Step: 12 Full Repair Urgent/Expedient.
c. Data Requirements (includes):
   i. Fault found/symptoms/work required

ii. Priority
iii. Parent Work Order number or reference

12. Full Repair Urgent/Expedient

a. It may be that it 'makes sense' to carry out the complete repair as soon as possible – for example, access to the site or equipment may be difficult. In this case, the full repair will be treated as urgent and will bypass the Work Request Management Process.
   i. The work may be significant, requiring planning or additional resources. If this is the case, it is preferable that the follow-on work be conducted at a later date.
   ii. If delaying the follow-on work required has chances of resulting in additional and unacceptable damage or cost, then it is better to carry out the follow-on work immediately.
b. Next Steps:
   i. YES: 13 Inform Supervisor
   ii. NO: END EXIT to Work Management Process

13. Inform Supervisor

a. The Technician needs to inform the Maintenance Supervisor of the continuing work required.
b. Next Step: 14 Urgent Work Accepted?

14. Urgent Work Accepted?

a. The Supervisor will decide whether to accept the work or not, as it will disrupt the Planned Maintenance work schedule.
b. Next Step:
   i. YES: 16 Assign Technician/Start Time
   ii. NO: 15 Update WO/WR (Priority <2)

15. Update WO/WR (Priority <2)

a. If the urgent repair is rejected by the Supervisor, the Work Order priority will need to be downgraded. The Supervisor should be able to do this directly.
b. Next Step: END EXIT to Work Request Management process
c. Data Requirements (includes):
   i. Update priority field
   ii. Add reason for rejection

16. Assign Technician/Start Time

a. The Supervisor will assign Technicians to complete the Work Order and determine a start time.
   i. The assigned Technician will need to develop a plan, at the same time as notifying the requestor that the situation is being addressed.
b. Next Steps:
   i. 18 Fast Track Job Planning, following any laid down processes and procedures.
   ii. 17 Notify Requestor (as required)

17. Notify Requestor (as required)

a. This will depend on the nature of the emergency reported, and the interest or situation of the requestor.

18. Fast Track Job Planning

a. Includes defining the Scope of Work, safety precautions, resources and materials required, and any coordinating activities to complete the work as required, or detailed in the Work Order. The time available to put this plan together may be limited.
b. Next Step: 19 Arrange Resources:
c. Data Requirements (includes):
   i. Total hours
   ii. Method Statements

iii. Risk Assessments
iv. Parts required
v. Parts received
vi. Suppliers required
vii. Permits authorized
viii. Planned start time (tentative)
ix. Planned/expected completion time
x. Failure Code

19. Arrange Resources

a. The Supervisor should arrange for resources required for the repair, as determined by the Technician, during the 'fast track' planning step. This might include spares, tools, contractors, equipment, and/or additional technicians.
b. Next Step: 20 Prepare Work

20. Prepare Work

a. The Technician should start to prepare the work.
b. Next Step: 21 Problem or Regulated Equipment

21. Problem or Regulated Equipment

a. Unexpected problems can occur, this could be as a result of gaining access to equipment, or if the equipment to be worked on is regulated, and requires further authorization to continue.
b. Next Step:
   i. YES: Request 22 Deviation Approval
   ii. NO: EXIT to Work Execution Process
c. Data Requirements (includes):
   i. PENDING/ON-HOLD
   ii. Reason for delay or deviation
   iii. Actual start time (update/correct)
   iv. Worked hours update/add (by Technician)

22. Deviation Approval

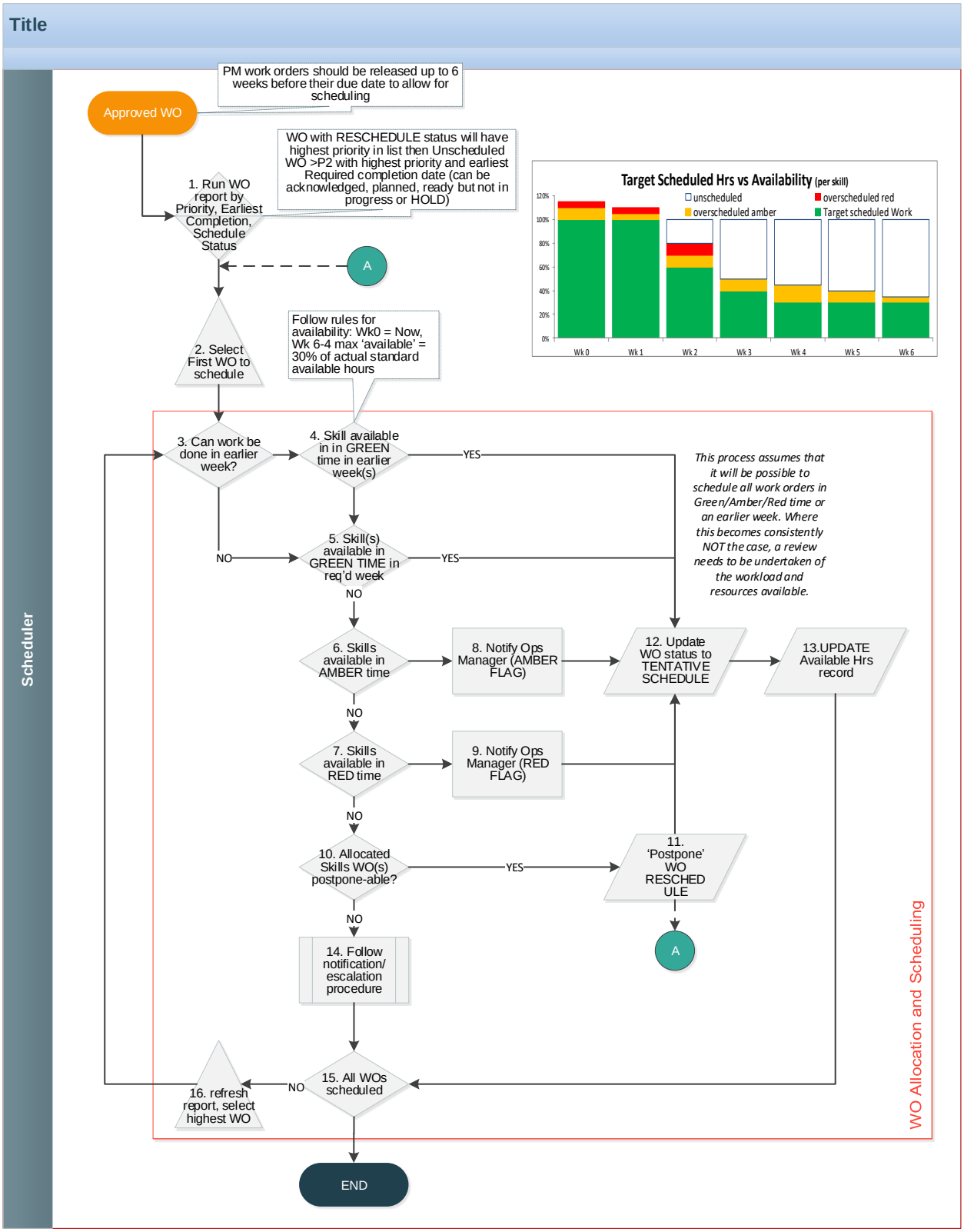
a. This step manages and assigns responsibility for creating a change away from the manufacturers or designers intended operation, or maintenance of equipment or system. For example, equipment may have to be operated in 'Manual' mode and monitored locally under Facility Surveillances.
b. Next Step:
   i. Deviation Allowed: END: EXIT to Performing Work Procedure (there may be conditions attached)
   ii. Deviation Not Allowed: 23 Make Safe
c. Data Requirement:
   i. Update WO with comments regarding deviation approval

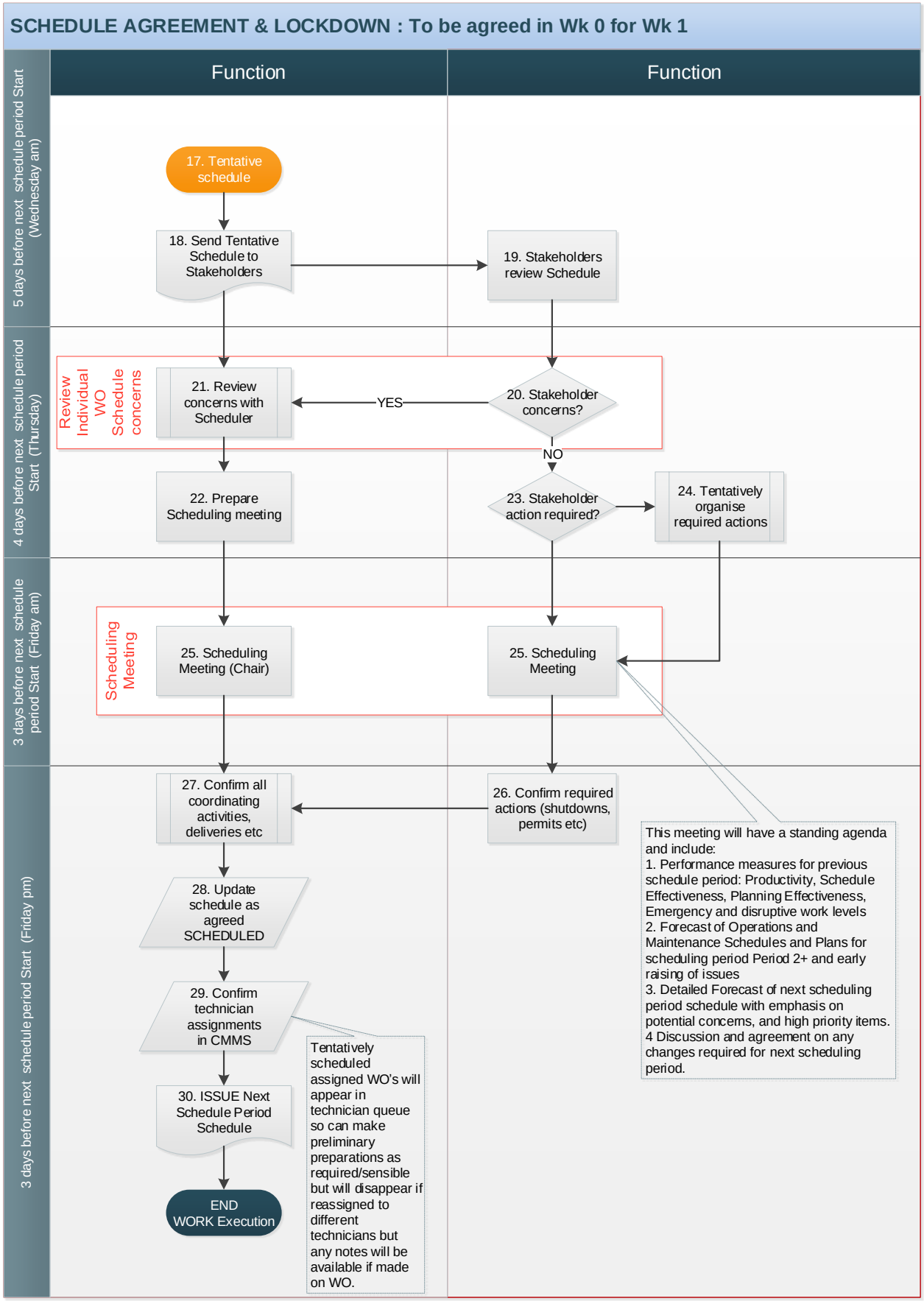
23. Make Safe

a. The emergency/urgent situation has had reactive and disruptive/unplanned work carried out in an attempt to complete a full and proper repair. However, a problem has meant the work has had to be stopped, and the situation 'made safe'.
   i. Whether or not it is possible to follow-up will be determined during the Work Closeout Procedure.
b. Next Step: EXIT to Word Closeout Procedure.
c. Data Requirements:
   i. Update with comments regarding decision-making

6.2.3 Scheduling Work

6.2.3.1 Process Flowchart





6.2.3.2 Detailed Procedure Steps

The Scheduler deals with two key activities happening simultaneously: the preparation of a tentative schedule which involves **'Allocating Work Orders to available hours',** and **'Preparing and agreeing on the Schedule'**. These two activities happen in a real-time environment where new Work Orders continually need to be scheduled, and existing Work Orders may need to be reallocated. The aspects surrounding the scheduling process mean that scheduling is an iterative process. This is where work that is allocated to available resources can sometimes experience changes to accommodate new demands. The goal is to be able to deliver work on time.

1. Run WO Report

a. The Scheduler needs to 'rank' Work Orders by 'earliest required completion date' and priority.
   i. The Scheduler should typically run the WO report and follow this sub-process, three or four times a day.
   ii. Those WOs with required completion dates, or past, scheduled completion dates, will be reviewed first, and more frequently.
   iii. Emergency and urgent Work Orders do form part of the scheduling process as they are managed by the unplanned/disruptive work management process
b. Next Step: 2 Select First WO

2. Select First WO

a. The Scheduler selects and reviews the WO with the earliest completion date and the highest priority.
   i. The CMMS may have the feature of assigning a RESCHEDULE status.
   ii. Unscheduled WOs with a Priority >P2 (led by highest priority and earliest required completion date) should be reviewed next.
b. Next Step: 3 Can work be Completed in an Earlier Week**Error! Reference source not found.**

3. Can work be Completed in an Earlier Week

a. For reactive and corrective work, it is usually permissible to schedule work to be carried out earlier than the 'required time'.
b. For 'Routine' tasks, even though allocation to an earlier week may be contractually permissible, some work must be done on or near the required completion date:
   i. An annual WO may be carried out within 30 days of the required completion date, whereas monthly Planned Maintenance needs to be completed within 3 days of the required completion date.
c. Next Steps:
   i. YES: 4 Skills available in GREEN TIME in Earlier Week
   ii. NO: 5 Skills available in GREEN TIME in Required Week

4. Skills available in GREEN TIME in Earlier Week

a. Are there hours available for the craft/skill group to carry out the work detailed in the WO Job Plan?
   i. The Scheduler would not normally assign a particular Technician without consulting the Supervisor. The required craft/skill resource is key at this step.
b. Next Steps:
   i. YES: 12 Update WO Status to TENTATIVE SCHEDULE
   ii. NO: 5 Skills Available in GREEN TIME in Required Week

5. Skills Available in GREEN TIME in Required Week

a. Are there GREEN hours still available in the required week for the craft/skill group to carry out the work?
   i. YES: 12 Update WO Status to TENTATIVE SCHEDULE
   ii. NO: 6 Skills available in AMBER TIME

6. Skills available in AMBER TIME

a. If the 'GREEN' target available hours within the required week are already allocated, the Scheduler should then consider over-allocating within specified tolerance levels. 'AMBER' hours 'over-allocations' may be reversed if necessary, by the Supervisor.
   i. Utilizing AMBER hours' means that the scheduling activity is outside the target scheduling guidelines, which brings an increased risk of running out of available resources as time progresses.
b. Next Steps:
   i. NO: 7 Skills Available in RED TIME
   ii. YES: 8 Notify Operations Manager (AMBER FLAG)

7. Skills Available in RED TIME

a. If the schedule's target and tolerance hours have been breached, the Scheduler can consider allocating the work required within the exceptional tolerance (RED) hours.
b. Next Steps:
   i. NO: 10 Allocated skills/WO(s) "postpone"
   ii. YES: 9 Notify Operations Manager (RED FLAG)

8. Notify Operations Manager (AMBER FLAG)

a. The Scheduler needs to notify the Operations Manager that the schedule hours' target has been breached, and of the possible consequences. Over-allocations scheduled for the next closest schedule period, result in overtime and/or additional resource requirements. These will need to be approved/arranged, by the Supervisor or Engineering Management.
b. Next Step: 12 Update WO Status to TENTATIVE SCHEDULE

9. Notify Operations Manager (RED FLAG)

a. The Scheduler needs to notify the Technician's Supervisor or Operations Manager of the intention to schedule this WO as this introduces the risk of over-allocating a Technician. This over-allocation will likely require authorized overtime.
   i. The Supervisor or Operations Manager may reject the request or allocation.
b. Next Step: 11 'Postpone' WO to RESCHEDULE

10. Allocated skills/WO(s) "postpone-able?"

a. With no 'RED' hours available in the target week. The Scheduler needs to postpone (i.e. change status to RESCHEDULE) a previously allocated existing WO, and also the required skillset resource, to make time available for the more urgent WO.
   i. This is only possible if there are Work Orders whose required completion date or priority, allows for them to be postponed to a later week, and if the required skillset resource is available at the expected postponed time
b. Next Steps:
   i. YES: 11 'Postpone' WO to RESCHEDULE
   ii. NO: 14 Follow Notification/Escalation procedure

11. 'Postpone' WO to RESCHEDULE

a. This WO has been allocated to a time and Technician that had a previously scheduled WO in place. The Scheduler has the existing WO and sets its status to RESCHEDULE.
   i. The previously scheduled WO is routed via the circled 'A' step (to between step 1 and step 2).

12. Update WO Status to TENTATIVE SCHEDULE

a. The Scheduler has allocated the most appropriate time-slot to this WO, and sets the status of this WO to TENTATIVE.
   i. With the need to schedule other WOs being an iterative process of (re)allocating time-slots and review by others, TENTATIVE is the most appropriate status.
b. Next Step: 13 Update Available Hours Record

c. Data requirements (includes):
   i. Update Work Order status to TENTATIVELY SCHEDULED

13. Update Available Hours Record

a. The Scheduler needs to deduct the required hours against each Technician from the record of available resources.
b. Next Step: 15 All WOs in Report scheduled?
c. Data Requirements: Update 'Available Hours' record as required.

14. Follow Notification/Escalation procedure

a. This is a separate process.
b. The Scheduler has tried to allocate this WO to all available and suitable resources without success, and hence the Scheduler needs to escalate a scheduling decision for this WO.
c. Next Step: 15 All WOs in Report scheduled?

15. All WOs in Report scheduled?

a. The Scheduler takes each highest-ranked WO in turn, until all WOs have been tentatively scheduled.
   i. The status of all scheduled WOs at this step is TENTATIVE.
b. Next Steps:
   i. NO: 16 Refresh Report, select highest-ranked WO
   ii. YES: END

16. Refresh Report, select highest ranked WO

a. The Scheduler needs to revisit the list of WOs requiring scheduling. Due to the iterative nature of scheduling, the Scheduler needs to refresh the list to ensure that the WO that is the latest, and at the top of the list, is dealt with first.
   Next Step: 3 Can work be Completed in an Earlier Week

Preparing and Agreeing to the Schedule

In parallel with the **'Allocating Work Orders to available hours'** activity that creates the tentative schedule. The Scheduler routinely proposes to, and seeks concurrence with, the client and other stakeholders on the tentative schedule. This activity is described below:

17. Tentative Schedule

a. The Scheduler compiles the tentative schedule for the WOs, periodically (typically weekly).
   i. The Tentative Schedule is comprised of confirmed work for the following week, and tentatively scheduled work, forecasted for the following four to five weeks.
b. Next Step: 18 Send Tentative Schedule to Stakeholders

18. Send Tentative Schedule to Stakeholders

a. The Scheduler sends the Tentative Schedule to the stakeholders who will review for concerns or actions.
   i. The Scheduler typically sends the Tentative Schedule and forecast to the Stakeholders (at least) five calendar days prior to the week in which the first WO is due to start (i.e. the Tuesday before the Sunday start).
b. Next Steps:
   i. 19 Stakeholders Review Tentative Schedule
   ii. 21 Review Stakeholder Concerns

19. Stakeholders Review Tentative Schedule

a. This review may require a stakeholder to consult with other personnel, though conscious that promptness, typically one to two days, is essential to keep the review process on track.
   i. The Supervisor is also a Stakeholder and, with the Scheduler having identified 'skill groups required', will have particular insight to the most suitable Technicians to later assign to each WO.
b. Next Step: 20 Stakeholder Concerns?

20. Stakeholder Concerns?

a. Any concerns that the Stakeholders might have with the Tentative Schedule should be forwarded to the Scheduler.
b. Next Steps:
   i. YES: 21 Review Stakeholder Concerns
   ii. NO: 23 Stakeholder Action Required?

21. Review Stakeholder Concerns

a. The Scheduler needs to review the reported concerns and consider adjustment/amendment of the schedule.
b. Next Step: 22 Prepare Scheduling Meeting

22. Prepare Scheduling Meeting

a. The Scheduler needs to prepare responses to the concerns reported by the Stakeholder.
b. Next Step: 25 Scheduling Meeting

23. Stakeholder Action Required?

a. Each Stakeholder must consider actions/responsibilities required of them.
   i. These responsibilities will vary. In the case of a building, for example, a custodian may have to alert the occupants of, or confirm with the security team of the impending work. The Supervisor will take on the responsibility of delivery of the work, according to the schedule and will take key preparatory actions.
b. Next Steps:
   i. 24 Tentatively organize required actions

ii. Attend 25 Scheduling Meeting

24. Tentatively organize required actions

a. Ahead of the scheduling meeting, the Stakeholders need to carry out any actions required by them, to facilitate the delivery of the scheduled work.
b. Next Step: 25 Scheduling Meeting

25. Scheduling Meeting

a. The Scheduling Meeting should typically be held towards the end of the week. The Stakeholders need to attend this meeting to resolve any outstanding concerns, and to agree to 'lock down' the proposed schedule.
b. Next Steps:
   i. 26 Confirm Required Actions
   ii. 27 Confirm Coordinating Activities

26. Confirm Required Actions

a. The Stakeholders need to confirm with the Scheduler that their preparatory 'required actions' have taken place.
b. Next Step: 27 Confirm Coordinating Activities

27. Confirm Coordinating Activities

a. The Scheduler needs to confirm that all preparatory activities and actions essential for the successful delivery of each WO, have taken place.
b. Next Step: 28 Update Schedule

28. Update Schedule

a. The Scheduler needs to update the status of each scheduled Work Order from TENTATIVE to SCHEDULED.
   i. There will be instances following the scheduling meeting and Stakeholder review that a WO is returned to the beginning of this process.
b. Next Step: 29 Confirm Technician Assignment

29. Confirm Technician Assignment

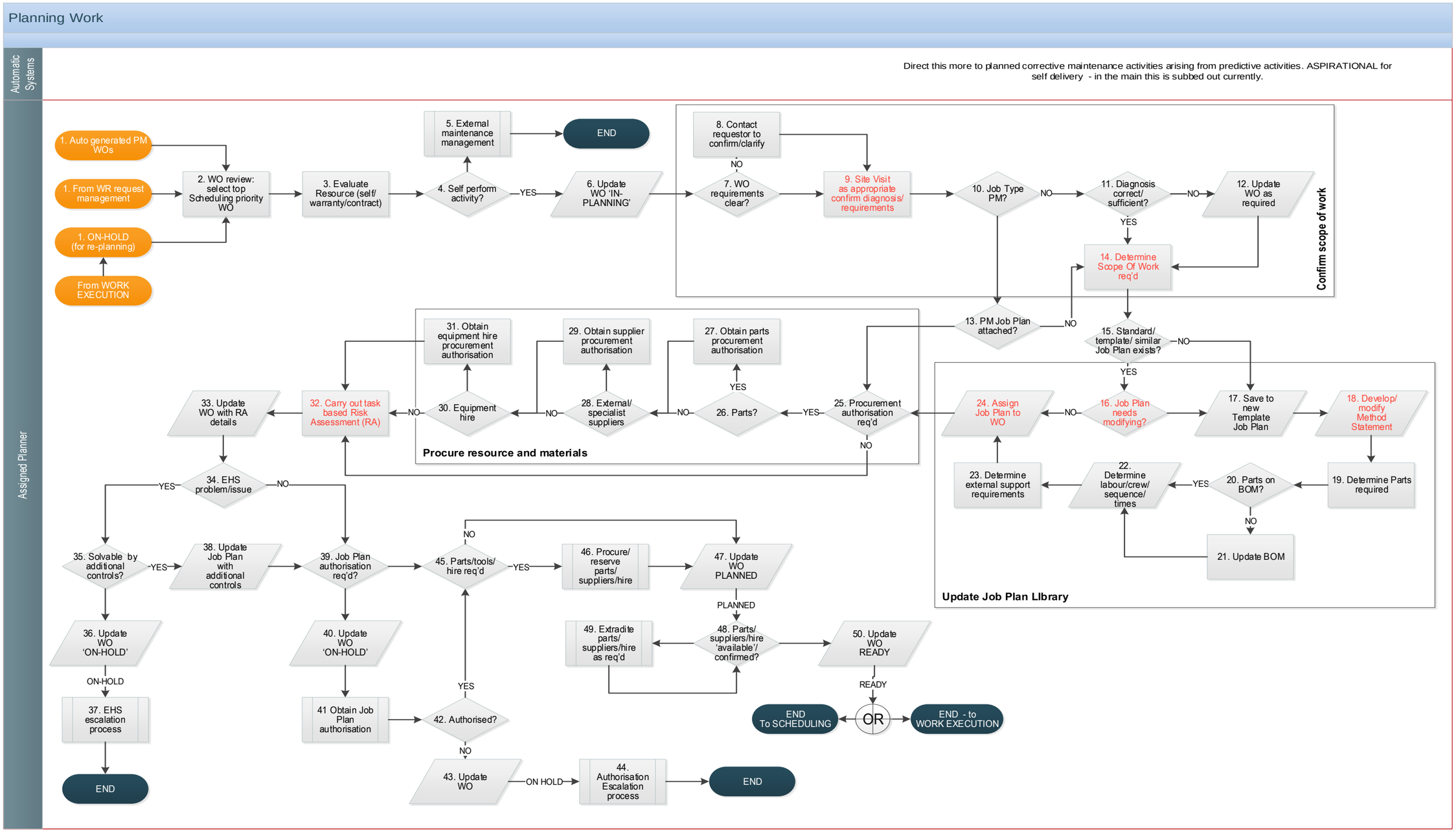
a. The Scheduler needs to update/confirm the assignment of work to each Technician based on the now SCHEDULED Work Orders.
b. Next Step: 30 Issue Next 'Schedule Period' Schedule

30. Issue Next 'Schedule Period' Schedule

a. The Scheduler needs to issue the schedule for the next schedule period.
   i. Responsibility for delivering the work according to the scheduled WOs, is that of the supervisor.
b. Next Step: END: EXIT to Performing Work Procedure.

6.2.4 Planning Work

6.2.4.1 Process Flow Chart



6.2.4.2 Detailed Procedure Steps

1. Inputs to the Work Order Planning Process

a. A Work Order requires planning. Sources may be:
   i. Planned Maintenance
   ii. Client or Client Stakeholder
   iii. Technicians
   iv. Corrective Work
   v. Work Orders needing re-planning
   vi. Scheduled Work Orders
b. Next Step: 2 WO Review

2. WO Review

a. The Planner reviews the WOs in order, based on completion date and priority.
b. Next Step: Evaluate Resource

3. Evaluate Resource

a. The Planner needs to determine the resource requirement for the WO. The work should fall under one of the following resource categories:
   i. Self-perform work: work to be carried out by the maintenance contractor
   ii. Warranty work: equipment that is maintained by the supplier
   iii. Contract work: work that is entirely externally resourced
b. Next Step: 4 Self-Perform Activity

4. Self-Perform Activity

a. Only self-perform work will progress through this process.
   i. Warranty and/or contract work will be resourced or managed under separate processes.
b. Next Steps:
   i. YES: 6 Update WO: IN PLANNING
   ii. NO: EXIT to External Maintenance Management

5. External Maintenance Management

a. This is a separate process to manage work that will be resourced/ managed by external contractors.
b. Next Steps: END: EXIT to External Maintenance Management Process.

6. Update WO: IN PLANNING

a. The planner needs to update the WO status to IN PLANNING.
   i. This status provides a marker for planning effectiveness and productivity KPIs. The Planner sends information to the requestor regarding the progress of the WO.
b. Next Step: 7 WO Requirements clear?

7. WO Requirements clear?

Entering the ‘Confirmation of Scope of Work (SOW)’ stage.

a. The planner needs to review the detail of the WO to determine if the work required is clear, and contains enough detail to start planning work, or if more information is needed. Depending on the situation, the Planner should consider contacting the requestor, before considering a visit to the site.
b. Next Steps:
   i. NO: 8 Contact Requestor
   ii. YES: 9 Site Visit
c. Data requirements: the following information is normally needed to start planning work:
   i. Location
   ii. Symptoms

iii. Asset details
iv. Requestor details
v. Priority of work
vi. Date requested
vii. Any known constraints to carrying out the work

8. Contact Requestor

a. The Planner needs to clarify faults, symptoms or work required, to have enough information for appropriate planning.
b. Next Step: 9 Site Visit

9. Site Visit

a. This is an optional step. A site visit may be required to confirm, diagnose, or determine the Scope of Work required.
b. Next Step: 10 PM Job Type

10. PM Job Type

a. Is the WO for a recurring, Planned Maintenance (PM)? If not, several steps will be required to complete certain key pieces of information.
b. Next Steps:
   i. YES: 13 PM Job Plan attached
   ii. NO: 11 Diagnosis Correct?

11. Diagnosis Correct?

a. The Planner needs to confirm the diagnosis or work required before determining the Scope of Work (SOW) required.
b. Next Steps:
   i. NO: incorrect diagnosis, 12 Update WO
   ii. YES: correct diagnosis, 14 Determine Scope of Work

12. Update WO

a. The Planner needs to record the correct, or modified diagnosis or work required.
b. Next Step: 14 Determine Scope of Work

13. PM Job Plan attached

a. Recurring Planned Maintenance should have a job plan attached.
   i. If this is the first time this work has been issued for this equipment, a job plan will need to be created.
b. Next Steps:
   i. YES: 25 Procurement Authorization Required
   ii. NO: 14 Determine Scope of Work

14. Determine Scope of Work

a. The Planner confirms/develops/drafts the SOW.
b. Next Step: 15 Similar Job Plans exists

15. Similar Job Plan exists

Entering the 'Update Job Plan Library' stage.
a. There may be a Job Plan in the Job Plan library, for similar work on the same, or similar equipment.
b. Next Steps:
   i. YES: 16 Job Plan needs modifying
   ii. NO: 17 Save new Job Plan

16. Job Plan needs modifying?

a. Is it possible that an existing job plan can be modified to meet the needs of this WO?
b. Next Steps:
   i. YES: an existing job plan can be used but needs adapting, go to 17 Save new Job Plan
   ii. NO: an existing job plan can be used as is, go to 24 Assign Job Plan to Work Order

17. Save new Job Plan

a. Create a new, or save the adapted Job Plan in the Job Plan library.
   i. The new job plan should be formally approved for technical content, and be named and numbered, as required by the naming convention.
b. Next Step: 18 Develop/Modify Method Statement.

18. Develop/Modify Method Statement

a. If using an existing Job Plan, the Method Statement should be modified as required.
   i. If creating a new Job Plan, the Method Statement should be created.
b. Next Step: 19 Determine Parts required

19. Determine Parts required

a. The Planner needs to determine all the parts required to complete the work.
   i. Refer first to the Bill of Materials, if it exists for the particular asset.
b. Next Step: 20 Parts on Bill of Materials

20. Parts on Bill of Materials

a. The Planner needs to review the Bill of Materials for the asset to see if the parts required are detailed there.
b. Next Steps:
   i. YES: the BOM is sufficient for the work required, go to 22 Determine Labor sequence/times
   ii. NO: the BOM is insufficient for the work required, go to 21 Update BOM

21. Update BOM

a. The Planner needs to update the BOM from their research, discussions and from reading the O&M Manuals.
   i. Updating the BOM during and after the planning process is Best Practice.
b. Next Step: 22 Determine Labor sequence/times

22. Determine Labor Sequence/Times

a. To assist the Scheduler later, the Planner needs to identify how many people are needed, the relevant skill sets, how long each task should take and which tasks can happen in parallel.
b. Next Step: 23 Determine External Support Requirements

23. Determine External Support Requirements

a. External support may be needed for a variety of reasons.
   i. Hiring of specialist equipment may be needed, such as high-level access platforms, degassing equipment, or temporary power supplies. ‘Municipal’ permission may also be required.
b. Next Step: 24 Assign Job Plan to WO

24. Assign Job Plan to WO

a. The Planner needs to attach the Job Plan to the Work Order.
b. Next Step: 25 Procurement Authorization Required?

25. Procurement Authorization Required?

Entering the 'Procure resources and materials' stage.

a. The Planner needs to determine if procurement authorization is required for the three key external inputs (parts, specialist support, and equipment hire).
   i. Authorization may be needed because of a cost threshold, or because it is outside of the contract.
   ii. 'Checks and signatures' may be required to confirm that the right authorization has been achieved. This is the planning phase and no actual purchases will be made until later.
b. Next Step:
   i. YES: 26 Parts
   ii. NO: 32 Carry out Task-Based Risk Assessment

26. Parts

a. Procurement Authorization required – Parts?
   i. The Planner needs to check the contract and/or company rules.
b. Next Step:
   i. YES: 27 Obtain Parts procurement authorization
   ii. NO: 28 External/Specialist Suppliers

27. Obtain Parts procurement authorization

a. The Planner updates WO with the procurement authorization obtained.
b. Next Step:
   i. 28 External/Specialist Suppliers

28. External/Specialist Suppliers

a. Procurement authorization required – external/specialist suppliers?
   i. The Planner needs to check the contract and/or company rules.
b. Next Steps:
   i. YES: 29 Obtain Supplier procurement authorization
   ii. NO: 30 Equipment Hire

29. Obtain Supplier procurement authorization

a. The Planner updates the WO with the External/Specialist Suppliers' procurement authorization obtained.
b. Next Step: 30 Equipment Hire

30. Equipment Hire

a. Procurement Authorization required – Equipment Hire?
   i. The planner needs to check the contract and/or company rules.
b. Next Steps:
   i. YES: 31 Obtain Equipment Hire procurement authorization
   ii. NO: 32 Carry out Risk Assessment

31. Obtain Equipment Hire procurement authorization

a. The Planner updates the WO with the Equipment Hire procurement authorization obtained.
b. Next Step: 32 Carry out Risk Assessment

32. Carry out Task-Based Risk Assessment

Entering 'Determine HSE requirements' stage.

a. With the securing of the Scope of Work, Job Plan and procurement authorizations, the Planner needs to carry out a Risk Assessment.
b. Next Steps: 33

33. Update WO

a. The Planner needs to update the WO with the results of the Risk Assessment.
b. Next Step: 34 HSE Problem/issue
c. Data provided:
   i. Job Plan complete
   ii. Procurement authorizations complete
   iii. Risk Assessment complete

34. HSE Problem/issue

a. The Health and Safety aspects of the WO need to be reviewed.
   i. It is Best Practice for a review to be carried out by another, suitably competent person, familiar with the site/client/contract/environment.
b. Next Steps:
   i. YES: 35 Solvable by 'Additional Controls'
   ii. NO: 39 Job Plan authorization required

35. Solvable by 'Additional Controls'

a. The review of the HSE aspects has identified a problem, which may be or may not be solved by additional controls. These additional controls may be qualifications via Authorized Person or Competent Person, with permission to work in a Confined Space, electrical Live Working, or other similarly hazardous environment.
b. Next Steps:
   i. YES: 38 Update Job Plan with 'Additional Controls'
   ii. NO: 36 Update WO: PENDING/ON-HOLD

36. Update WO: PENDING/ON-HOLD

a. The review of the HSE has concluded that escalation to a higher authority/manager is required and hence the Planner needs to place the WO as PENDNG/ON-HOLD.
b. Next Step: 37 HSE Escalation Process
c. Data requirements:
   i. WO Status: PENDING/ON-HOLD
   ii. Reasons for status change
   iii. Actions taken already or suggested
   iv. Additional detail as required

37. HSE Escalation Process

a. This is an external process. This process is designed to resolve HSE issues identified in the Job Plan or Risk Assessment.
b. Next Steps: END: EXIT to HSE Escalation Process.

38. Update Job Plan with 'Additional Controls'

a. The Planner needs to update the Job Plan with the suggested HSE 'additional controls'.
   i. These may incur additional costs or planning efforts, and require a revision to the Method Statement or Risk Assessment.
b. Next Step: 39 Job Plan authorization required

39. Job Plan authorization required

Entering the 'Job Plan Authorization' stage. This new documentation will have to comply with the Quality Assurance procedure of the organization.

a. The Planner needs to check if the Job Plan needs authorization before the final planning steps can be completed.

b. Next Steps:
   i. YES: 40 Update WO: PENDING/ON-HOLD
   ii. NO: 45 Parts/suppliers/hire required

40. Update WO: PENDING/ON-HOLD

a. Job Plan Authorization is needed and hence the WO is PENDING/ON-HOLD until this is received.
b. Next Steps: 41 Obtain Job Plan Authorization
c. Data Requirements:
   i. WO Status: PENDING/ON-HOLD
   ii. Reasons for status change
   iii. Actions already taken or suggested
   iv. Additional details as required

41. Obtain Job Plan Authorization

a. This is an external process that is designed to achieve Job Plan authorization.
b. Next Step: 42 Authorized?

42. Authorized?

a. Has the Job Plan been authorized?
b. Next Steps:
   i. YES: 45 Parts/suppliers/hire required
   ii. NO: 43 Update WO: PENDING/ON-HOLD

43. Update WO: PENDING/ON-HOLD

a. The WO has been placed on hold until the Job Plan Authorization has been received.
b. Next Step: 44 Authorization Escalation Process

44. Authorization Escalation Process

a. This is an external process. This process is designed to receive Job Plan authorization. Once received the WO can continue.
b. Next Step: END: EXIT to Authorization Escalation Process.

45. Parts/suppliers/hire required

a. Parts, external/specialist suppliers and/or equipment may be hired as needed.
   i. If applicable, procurement authorization and quotations should have been obtained in a previous step.
b. Next Steps:
   i. YES: 46 Procure/Reserve Parts/Suppliers/Hire
   ii. NO: 47 Update WO: PLANNED

46. Procure/Reserve Parts/Suppliers/Hire

a. This is an external process designed to contractually engage the supply of materials, equipment, and/or services.
b. Next Step: 47 Update WO: PLANNED

47. Update WO: PLANNED

a. The Planner needs to update the WO status to PLANNED.
b. Next Step: 48 Parts/Suppliers/Hire ‘available’ Confirmed
c. Data Requirements (typical):
   i. Total Hours per Technician
   ii. Method Statement (incl. N/A)
   iii. Risk Assessment (incl. N/A)

iv. Parts Required
v. Parts Reserved
vi. Suppliers Required
vii. Permits Authorized
viii. Planned Start Time (tentative)

48. Parts/Suppliers/Hire 'available' confirmed?

a. The Planner needs to confirm with the external suppliers that they can deliver as requested. If not, the Planner needs to arrange an alternative supplier.
b. Next Steps:
   i. YES: 50 Update WO: READY
   ii. NO: 49 Source Parts/Suppliers/Hire as Required

49. Source Parts/Suppliers/Hire as Required

a. This is an external process designed to secure provisions from an alternate supplier, as the previously arranged external suppliers have not been able to 'confirm' the delivery of parts, equipment or services.
b. Next Steps: 48 Parts/Suppliers/Hire 'available' confirmed?

50. Update WO: READY

a. The Planner needs to update the WO status to READY.
b. Next Steps: END: EXIT to Scheduling and/or Work Execution Process.
c. Data Requirements:
   i. WO: READY.

7.0 ATTACHMENTS

Attachment 1 - EOM-ZW0-TP-000001 - Scheduling Checklist

Attachment 1 - EOM-ZW0-TP-000001 - Scheduling Checklist

Contract/Client NAME:		REV- 001
Week Dates:		

No.	Checklist to keep work on schedule	CHECKED SATISFACTORY		
		N/A	YES	NO
7 Day Daily/continuous Checklist for Work Management Center Supervisor/Manager.				
Daily /continuous				
1	Have all emergency/priority 1 Work Orders been assigned?	☐	☐	☐
2	Have all urgent/priority 2 Work Orders been assigned?	☐	☐	☐
3	Have Works Orders requiring rescheduling been identified?	☐	☐	☐
4	Have Work Orders requiring rescheduling been resolved for issues preventing assigning?	☐	☐	☐
5	Has a Target Finish Date Report been run from the CMMS?	☐	☐	☐
6	Have Supervisors been followed-up with to identify Work Orders at risk of failure?	☐	☐	☐
7	Have Work Orders requiring 'access requests' been identified?	☐	☐	☐
8	Have repeated access requests been made and recorded in the CMMS?	☐	☐	☐
9	Have Work Orders requiring parts been identified?	☐	☐	☐
10	Have suppliers been chased for update/priority service?	☐	☐	☐
11	Have requestor enquiries been responded to?	☐	☐	☐
12	Have the communications logs within the CMMS been updated?	☐	☐	☐
13	Have any personnel/team been/at risk of being overloaded?	☐	☐	☐
14	Have high impact/profile or statutory infringements Work Orders been identified?	☐	☐	☐
15	Have high impact/profile or statutory infringements Work Orders been prioritized?	☐	☐	☐
Mid-week				
16	Have access requests been recorded in the CMMS and escalated to the client/other as required?	☐	☐	☐
17	Has the CMMS been checked for any duplicate Work Orders?	☐	☐	☐
18	Have Work Orders been grouped and assigned based on location to maximize efficiency?	☐	☐	☐
19	Have Work Orders requiring multiple trades been identified?	☐	☐	☐
20	Have the supervisors of multiple trade Work Orders been made aware, coordinated with?	☐	☐	☐
21	Have corrective maintenance Work Orders been efficiently combined with Help Desk Work Orders?	☐	☐	☐
22	Have requestors of Work Orders needing rescheduling been advised of the revised dates?	☐	☐	☐
23	Have Work Orders requiring parts been work flowed to stores/suppliers/purchasers?	☐	☐	☐
24	Has the average completion time for low priority Work Orders been reviewed?	☐	☐	☐
25	Have performance/risk/issues reports been made to the manager/senior manager?	☐	☐	☐

No.	Comments	Comments
Work Management Center Supervisor signature:		Line Manager signature: