October, 2020

Facebook Facilities Operations

FacOps Work Management Standard

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Revision	Change Date	Changed By	Pages	Comments
Rev 0	October, 2020	FOBP D4	All	Initial Release

Record of Changes

Acronyms

Contractor Method of Procedure	C-MOP
Control of Hazardous Energy	CoHE
Critical Facility Engineer	CFE
Critical Facility Manager	CFM
Critical Operations Manager	COM
Cross-Functional	XFN
Data Center Campus Facility Manager	DCCFM
Edge and Network Services	ENS
Environmental Health & Safety	EHS
Facility Project Engineer	FPE
Facility Project Manager	FPM
Facility Technical Manager	FTM
Field Operations	FieldOps
General Contractor	GC
Global Data Center Connectivity	GDCC
Infrastructure Business Operations Support	IBOS
Infrastructure Construction Management, Retrofits	ICM Retrofits
Lock Out Tag Out	LOTO
Non-Critical Work Permit	NCWP
Quality Assurance/Quality Control	QAQC
Request for Information	RFI
Site Operations	SiteOps
Sourcing and Operations Engineering	SOE

Subject Matter Expert	SME
Transfer of Custody	ToC

Purpose

The Work Management Standard provides direction for managing FacOps work to drive a consistent process across the IDC fleet to ensure safe, reliable, and efficient operation of data centers. The process outlined in this document applies work management best practices by breaking down work to distinct phases to clearly define problems, driving planning /scheduling, and executing efficiently using aligned EE tooling.

Note: This document is outlined and written utilizing a method that provides an initial overview of the process and phases before getting into more detailed information about how work is managed to include the roles and responsibilities within each phase. Some information is repetitive within this document, however as the information is repeated this document will continue to add detail and clarity through elaboration.

1. Introduction to a work management process

1.1 Work Management Phases

The work management process consists of 6 unique phases: origination, planning, scheduling, final preparations, execution and completion.

The use of phases within the work management process facilitates specific objectives respective to each phase that will provide deliverables for the next phase of the process to ensure both scope and schedule stability during execution.

The goal is to progress each Work Order through the process prior to execution based on prioritization. Corrective Work orders that require immediate action shall follow section 8a. – Sponsored Work.

1.2 Phase Objectives & Deliverables

a) Origination

a. Definition:
   i. The phase where work is identified and documented in various forms, whether it be through a butterfly bot for PM's or a work request for corrective work.

b. Objectives:
   i. Troubleshooting complete
   ii. Problem clearly identified
   iii. All appropriate Work Request fields populated per section 2.2.b

c. Deliverables:
   i. Work Request that has been approved to be actioned.
   OR
   ii. Work order in the "Created" status ready to be placed in the work management cycle

b) Planning

a. Definition:
   i. Planning is the allocation of resources, materials, steps, and requirements to complete a task. "It's the What and the How"

b. Objectives:
   i. Identify proposed week of execution (T8)
   ii. Aggregate work order to define the work breakdown structure (WBS)
   iii. Identify procedures needed for use
   iv. Identify production impact
   v. Identify resources required to complete the scope of work
   vi. Identify resource durations
   vii. Identify permits needed to support work scope

viii. Identify if LOTO is needed to facilitate work
ix. Order parts necessary to complete repairs
x. Submit purchase orders and/or contract requests as necessary

c. Deliverables:
    i. Provide detailed work packages that identify scope, role of the performer and estimated duration.

c) Scheduling

a. Definition:
    i. Scheduling is the assignment of planned activities into time periods and to specific resources. "It's the When and Who"

b. Objectives:
    i. Identify resource demands (events, all-hands, etc)
    ii. Identify resource loading requirements
    iii. Identify work bundling opportunities
    iv. Perform system deconfliction

c. Deliverables:
    i. Provide a "frozen" resource balanced schedule

d) Final Preparation

a. Definition:
    i. Final preparation is the last phase before execution. The purpose of this phase is to finalize all administrative tasks identified in the planning phase. All permits should be filled out, LOTO records created along with other administrative task identified below. "Is it ready to work or not?"

b. Objectives:
    i. Validate procedures are ready for use (SOP, MOP, CMOP)
    ii. Ensure parts have been received and staged
    iii. Complete required permits
    iv. Prepare eLOTO records and verify approved for use (if applicable)
    v. Validate vendor access has been granted (if required)
    vi. Validate production impact tasks are "initiated" on per scheduled date

c. Deliverables:
    i. Provide all necessary LOTO records, permits, procedure, production impact notifications and parts validations to ensure work can start as scheduled.

e) Execution

a. Definition:
    i. Execution is the phase where the physical work in the data center occurs per the scheduled workday in the manner in which the work was planned.

b. Objectives:
    i. Finalizing a JSP
    ii. Execute work scope as planned
    iii. Identify additional work needs via a work request
    iv. Identifying carry over work (work not completed in the week of planned execution)

c. Deliverables:
    i. Update the work order status as Complete
    ii. Identify carry-over work

f) Completion

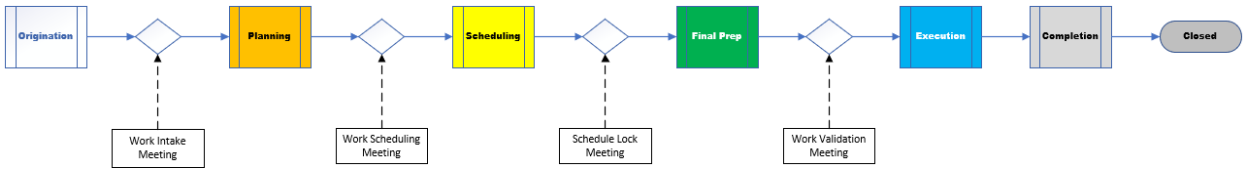
a. Definition:
    i. Close out is an administrative phase where the executed work will be closed out after all feedback via comments, hours and hot washes have been conducted to document what was done.

b. Objectives:
    i. Provide necessary documentation
    ii. Identify improvements
    iii. Closure of purchase orders, service contracts and any other accrued expenses

1.3 Phase Gates

A meeting should occur at each phase transition to ensure that the deliverables are met before moving forward in the next phase of the work management cycle. Should the deliverables not be met, it is expected that the work order be delayed until the following week to allow for the phase objectives to be met. The general approach to these meetings

should be what is best for the site, but a recommendation is to bundle the work intake meeting with the planning meeting and then bundle the scheduling meeting with the final preparations meeting. An example is set of meeting shown below and covered in Section 9.



Note: The meeting purpose shown is recommended for effective management of the process. Meeting agendas, times, attendees, locations and methods (face-to-face, video conference, etc) are determined by each data center. The required content across the stages is typically consolidated to a common agenda.

1.4 Roles, Responsibilities & Actors

Note: Roles are functions that reside within the CMMS tooling whereas actors are the people within the DC that perform the noted responsibilities in section 1.4.b.

a) Roles – CMMS

a. Owner
- All work orders shall have the building specific CFM listed as the owner. In cases where a specific building is not applicable, the area designee shall be the assigned owner.

b. Planning Group
- The functional work group that will oversee or perform the planning of the work shall be identified in CMMS as the work group.

c. Role
- The functional work group that will perform the execution of the work shall be identified in CMMS as the role.

d. Assignee
- The person or shift quadrant assigned to perform the work activity assigned to the work order.

b) Actors & Responsibilities - FacOps Work Order Management

a) Origination

- Actor – Everyone
- Responsibilities-
    - MPC – Ensure all PM's are generating and within a compliance window that aligns to the sites PM strategy.
    - FPM – Ensures all project work orders are created to outline the scope of the project aligned with the RAMP Standard Cycle and Ramp Standard Roles and Responsibilities.
    - Everyone – Create work requests to identify deficiencies within the DC campus
        - CFM's – Review work requests for completeness, verify they are not a duplicate, assign a priority and convert to work orders that will go into que for the work management process.
            - *Note: If the work will not enter the work management process, the CFM's will assign the work requests and provide guidance.*

b) Planning

- Actor – 2 & Planning Group
- Responsibilities-
    - Aggregate the work order into a work breakdown structure (WBS) to a level that each activity within the WBS can be performed by a single role.
    - Define the sequence of execution within the WBS
    - Identify the Planning Group for each activity in the WBS
    - Planning Group
        - Attach and/or author any procedures that are required to perform the work within the assigned activity in the WBS.
        - Identify production impact(s)
        - Identify what permits are required to perform the work (if applicable)
        - Identify if LOTO is required to perform the work
        - Define the role that will execute the work activity
        - Define the number of people required to complete the activity
        - Estimate work order activity durations based on analogous estimates (if available)

c) Scheduling

- Actor – 3
- Responsibilities-
    - Define the site resource loading percentage

- Define the work type split within the resource loading percentage(s)
- Identify the available hours per role
- Shift activities within the scheduling phase across weeks as needed to bundle work to support efficient DC maintenance and operations.
- Change “Planned Start Date” to the day in the week that the work will occur. Update “Planned Finish Date” based on duration of work activity.
- Validate work scheduled does not conflict with any other work that is scheduled for the same time period.

i. Final Preps

- Actor – 4
- Responsibilities-
  - Verify any procedures identified for use are approved
  - Populate permits identified as required during the planning phase (if applicable) & route for approval as required
  - Prepare eLOTO record(s) to facilitate the work scope within the work order (if applicable)
  - Verify access for any assigned vendors
  - Validate production impact tasks are initiated for the “Planned Start Date”

d) Execution

- Actor – 5; The assigned role, shift quadrant or person within the CMMS work order activity
- Responsibilities:
  - Complete the work scope as defined and articulated in work order activities and procedures.
  - Update the work order activity status to “Complete” once finished
  - Create follow up work requests for additional work scope identified during execution

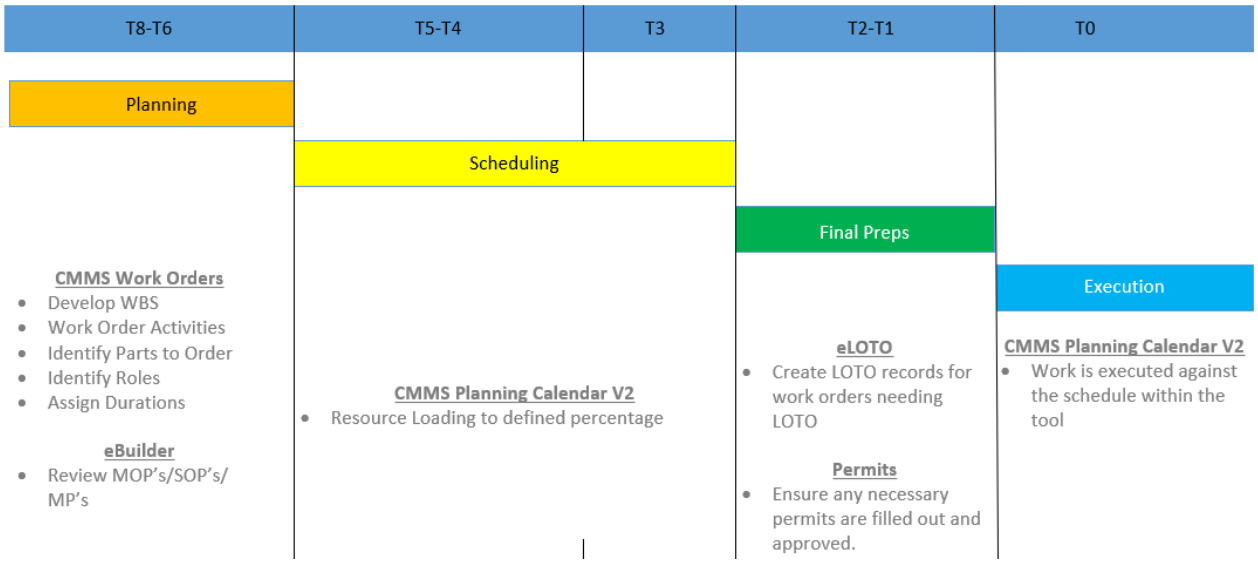
e) Completion

- Actor – 6
- Responsibilities:
  - Update work order with appropriate comments

- Attach any required documentation of historical significance
- Provide any enhancements as needed for procedures, durations, etc
- Ensure time is appropriately charged to the work order

ii. See Attachment 2 for site actors' template

1.5 Tools used in Work Management Process



2. Work Origination

2.1 Understanding Work Order types and Method of Origination

a) Preventative Maintenance (PM)
    a. Work that is part of a maintenance strategy that is based on a series of actions (scope) that are performed on an asset on a time-based schedule (frequency). The frequency will be based on either calendar or operating hours.
    b. MMI/BOT Generation

b) Predictive Maintenance (Pd)
    a. Work that is generated through measuring the condition of an asset and providing maintenance requirements based on present and/or predicted condition of the asset.
    b. Bot Generation

c) Warranty
    a. A corrective work type that is covered within the contracted warranty period specific to the equipment manufacturer and/or vendor by the manufacturer or vendor. This work is performed by trade partners but is managed by the DC general contractor (GC).
    b. General Contractor will have a Warranty Liaison that will create a BIM Issue to track warranty issues identified within warranty period
    c. Work Request

d) Corrective
    a. A work type that is performed to correct the deficiencies found during PM and CBM tasks, as well as after the asset has failed or stopped performing required function(s).
    b. Work Request

e) Non-Corrective
    a. A work type that is used for inspections, QA/QC or other types of effort that does not meet the definition of preventative, predictive, warranty or corrective work.
    b. Work Request

f) Project
    a. A work type that is used for work that is associated with Data Center improvement initiatives based upon RAMP program criteria. Project work

may overlap corrective work if deficiencies are corrected on a larger programmatic scale.

b. The intent of having the Project Type work order is to identify and communicate key tasks that impact FacOps from the project into the Work Management process. This is not the detailed execution plan but is an outline that provides FacOps a high-level understanding to enable to manage risk in an operating datacenter.
c. Project work shall be executed aligned with the RAMP Standard with specific focus on the RAMP Cycle that defines key project milestones for Approved for Execution (AFE) projects. Additionally, all project work shall be completed per RAMP Standard Roles and Responsibilities.
d. Work Order

g) Administrative
   a. a work type that is used to support site education opportunities. Examples include PIAG's, PQS qualifications, All-Hands, etc.
   b. Work Request

2.2 Creating a Work Request

a) A work request is the first step in identifying issues to be corrected. Once a work request has been submitted it will be reviewed during a "Work Origination Review" meeting where it will be evaluated for accuracy, applicability and if warranted, it will be converted to a work order which will enter the work management process once other criteria are assigned such as priority and work order type.

   If the work request meets specific criteria outlined in the work origination process map, it may be worked outside the work management process as a work request and progress tracked using the appropriate status indicators.

b) Required Information

   a. Title
   This should identify the objective of the work order. Example: "Replace CU-31A fan motor"

   b. Description
   This should identify what problem exists that the work order is expected to solve. Example: "Motor running hot, high current"

   c. Assets

The work order shall be written against a specific asset within the DC. Example: “PNB1 CU-31A”

d. Selecting areas when unknown or ambiguous
    i. Reference Attachment 1 for list

c) Work Request Process Map

2.3 Creating a Work Order

a) Selecting a type
    a. Preventative (bot generated only)
    b. Predictive
    c. Warranty
    d. Corrective
    e. Non-Corrective
    f. Project
    g. Administrative

b) Identify an Owner
    a. Building
        - Building specific CFM
    b. Substation
        - Designated CFM
    c. Ambiguous Locations
        - Reference Attachment 2 for ambiguous locations template.

c) Define the work order priority
    a. See Attachment 3 for priorities
    b. High/Unbreak
        - See section 8b. & 8c. for exceptions

d) Required Information
    a. Tags

    Tags are predefined by the type of work order and functional type of issue. A predefined list is determined by selecting any of the options displayed in Attachment 11.

2.4 Work Origination Process Map

3. Planning

3.1 Create a Work Breakdown Structure (WBS)

a) What is a work breakdown structure?
    a. Definition – a hierarchical decomposition of the total scope to be carried out to support the objective of the work order via specific deliverables.
    b. Example – Reference Attachment 5

3.2 Identify Planning Group

a) Planning Group
    a. CFE
    b. Controls SME
    c. Electrical SME
    d. Mechanical SME
    e. EH&S
    f. CFT

3.3 Identify Applicable Procedures

a) SOP's
Standard Operating Procedures are to be used by FacOps for routinely operating, isolating and/or restoring equipment. Only approved SOP's shall be used in the DC.

b) MOP's
Methods of Procedure are to be used by FacOps for single use operations and/or maintenance. Only approved MOP's shall be used in the DC.

c) CMOP's
Contractor Method of Procedure are to be used by all contractors for any maintenance and troubleshooting activities performed at the DC. Only approved CMOP's shall be used in the DC.

3.4 Identify Production Impact

a) Identify the type of production impact in drop-down box
    a. MSG; Isolation of normal power, open transition to alternate power
    b. Isolation of primary power, no redundant
    c. Isolation of primary power, open transition to redundant power
    d. Isolation of redundant power
    e. Impact to be determined
    f. No production impact

b) Does a production impact task need to be generated
    a. Select the Generate PI in the asset field

3.5 Identify Resource Requirements

a) Define Role that will perform the work activity
    a. CFE
    b. Controls SME
    c. Electrical SME
    d. Mechanical SME
    e. EH&S
    f. CFT
    g. Vendors

b) Identify the number of person-resources necessary within the role to support the activity

c) Estimate Duration

3.6 Identify if Permits are Needed

a) Fire Suppression Impairment
b) Energized Electrical Work Permit
c) Confined Space
d) Hot Work
e) Gen Yard
f) Lifting Operations (if applicable)

3.7 Identify if LOTO is Needed

a) Control of Hazardous Energy
b) Configuration Control (Out of Service Locks)

3.8 Order Necessary Parts

a) Generate material requisition
    a. BOM
    b. Warehouse inventory

b) Procure through a purchase order
    a. Lead time (on-site date) is identified prior to execution week
        i. Update status when planning is complete and let work continue through the WM cycle
    b. Lead Time exceeds execution week
        i. Update status when planning is complete and place a “Hold” on the work order.
        ii. When parts are received, remove “Hold” on work order.
        iii. Sponsor work into WM Cycle at the next T6 Work Scheduling Meeting.

3.9 Identify execution sequence within the WBS

3.10 Update activity status

a) Update status to “Ready to Schedule”

3.11 Work Planning Process Map

4. Scheduling

4.1 Reference the week of execution

4.2 Review Site Events

a) Identify Duration of Events
b) Identify Attendees

4.3 Identify Site Work Availability

a) Identify Resource Availability after Site Event Deduction
b) Identify Desired % Resource Loading
c) Identify Work Type Allocation (PM/CM/WY/Project)

4.4 Identify Work Bundling Opportunities

4.5 System De-Confliction

4.6 Schedule activity to a specific date within the calendar

a) Dependency based
b) Resource loading

4.7 Assign Work order activities

a) Shift Quadrant (CFE's) – NORAM
b) Shift "1-8" (CFE's) - EMEA
c) Individual (SME's, CFT's, etc.)

4.8 Update Activity Status

a) Update status to "Scheduled"

4.9 Work Scheduling Process Map

5. Final Prep

5.1 Procedure Validation

a) Ensure all SOP's, MOP's and CMOP's authored for use are appropriate and approved for work.

5.2 Parts

a) Received
   Verify all parts identified on the work order are received in the warehouse and allocated for the work order.

b) Staged
   All parts received at the warehouse and allocated for the work order shall be grouped in a common storage space or tote and identified on the work order planning page.

5.3 Permits Completed

a) Fire Suppression Impairment
b) Energized Electrical Work Permit
c) Confined Space

d) Gen Yard
e) Hot Work
f) Lifting Operations (if applicable)

5.4 LOTO record ready to work

a) Prepare eLOTO record
    a. Control of Hazardous Energy
    b. Configuration Control (Out of Service Locks)
b) Approve eLOTO record

5.5 Access Management

a) Vendor Access
   For re-occurring work that is performed by a vendor, a provisional badge is a preferred method of vendor access to ensure work can be performed with the least amount of constraints on other site resources.
    a. Badging
        i. Provisioned
           Having gone through background checks to facilitate unescorted access within the data center in areas required to execute work scope.
        ii. Non-Provisioned
           A temporary badge assigned to a vendor who cannot work in the data center without a qualified escort.
    b. Escorts
       A contingent or FTE who is qualified to escort a vendor during their duration at the data center in the required areas.

b) Training
    a. FBAM On-Boarding Process
       On-boarding that is required for a vendor to perform work in the data center. This on-boarding consists of standard EH&S familiarity as well as signatures that document training occurred.

5.6 Update Activity Status

a) Update status to “Ready”

5.7 Final Preps Process Map

6. Execution

6.1 Complete a JSP, if applicable

6.2 Execute work scope as planned

6.3 Corrective Work Identified during Work Execution

a) Submit Work Request
    a. When to complete during current work scope
    b. When to use the work management cycle to correct at a future date
    c. Work Origination Process Map

6.4 Carry Over Work

a) Work started, not finished
    a. Work that is in the “In-Progress” status that has started, but not finished shall continue into the following week, however during a T0 schedule review

meeting, any work that may be impacted shall be deconflicted. It is up the Building CFM to determine how to best manage their carry over as they see fit.

b. For carry over work that will be executed the following work week, the "Planned End Date" shall be extended to the day that the activity is planned to be finished as early as possible the next week.

b) Work not started
    a. Work that is in the "Ready" status and not started shall be returned to the Scheduling phase to be rescheduled within the work week in which it best fits. Should work be carried back to the Scheduling phase, the status should be updated to the "Ready to be Scheduled" status and have the "Planned Start Date" adjusted to the revised week of execution.

6.5 Work Execution Process Map

7. Completion

7.1 Documentation

a) Provide completion comments

b) Upload any necessary vendor and/or test reports
    a. Report Format
        i. PDF
        ii. Hyperlink to source of report
    b. Validate test reports
        i. Using predefined thresholds, spawn corrective work orders when test results are not favorable.
c) Update asset information (if changed)

d) Return unused parts

e) Document failure codes

f) Document time spent working on work order (activity)

g) Vendor Performed Work
    a. Update vendor scorecard
        i. Complete vendor survey

7.2 Improvements

a) Procedure updates

b) Revise resource estimates / Durations
    a. Re-Occurring Work
    Note: For work that is reperformed at a specific periodicity, work durations shall be updated to ensure the estimated durations accurately represent the time required to perform the scope. Durations shall be updated when the actual time to complete is beyond the amount of variance each site is willing to consider allowable.

        i. PM's
            1. Update the maintenance plan with correct duration estimate

    b. Single Use-Iterative Work

    Note: For corrective or project work that is performed as a single instance for specific scope, updating a resource estimate is not required. However, if there is repetitive scope that is scheduled to be performed and the estimated duration of the first iteration exceeds an allowable variance, the estimated duration should be revised and the schedule should be reviewed for proper resource loading.

        i. Corrective Work Orders
        ii. Project Work Orders
            1. Provide updated duration estimate to the "scheduler" identified as "Actor 3" for the site.
            2. Actor 3 shall update the iterative activities with the updated duration estimate and ensure resource loading can accommodate the change.

    c. Hot wash / Lessons Learned

7.3 Accrue work order costs

7.4 Work Completion Process Map

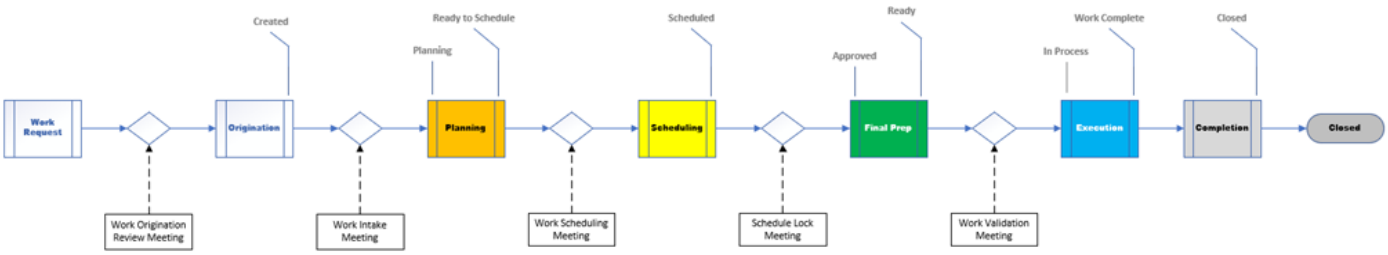
8. Work Management Process Exceptions

a) Sponsored Work
    a. Sponsored work is work that will be expedited through the work management process and placed into the workstream of a work week appropriate as directed by the building's CFM. Being a sponsored work order does not change the priority of the work

b) Equipment Criticality
    a. FacOps Asset Management Guideline
        i. Asset Planning and On-Boarding
            1. Asset Criticality

c) Work Order Priority
    a. See Attachment 4
        i. High
        ii. Unbreak

9. Meetings



9.1 - Work Origination Review

a) Work Request

A meeting should occur at a pre-defined recurrence appropriate for each DC that reviews work requests written since the last Work Origination Review meeting. The ideal periodicity is daily Monday through Friday.

The goal of the meeting will be to review the work orders and ensure they are complete, accurate and valid. Per the Work Request process map the Work Request Review meeting will be used to determine if a work request is able to be worked outside the work management process as a work request or if it needs to be converted to a work order and loaded into the work management process.

Checklist in Attachment 6.

9.2 - Work Management Meetings

a) Work Intake (T8)

The work intake meeting shall be a weekly meeting typically scheduled on Monday that reviews work orders in the “Created” status and determines which of the work orders shall be placed into the work management process with the intention to execute.
The decision of what is placed into the T-8 work management process should consider the work order priority, days outstanding and opportunities to bundle the work with other work on the same equipment/system. This bundling effort is associated with performing work that aligns to PM’s in their compliance window.

Work orders that are placed into the Work Management Process, will have their status updated from “Created” to “Planning” to designate the phase of the cycle the work order is in and then update the “Planned Start Date” to the Monday that is 8

weeks out from the following week. This will help designate which week the work is planned to be executed in, but not scheduled for.

The work planning phase has a two-week duration, by the end of two weeks the objectives of the planning process should be met, and the status indicator shall be updated from “Planning” to “Ready to be Scheduled”.

Checklist in Attachment 7.

b) Work Scheduling (T6)

The Work Scheduling meeting shall be a weekly meeting typically scheduled on Monday to ensure work that has been planned for the T6 week has been planned and in the “Ready to be Scheduled” status in preparation for scheduling.
The scheduling phase has a three week duration which allows for work to be moved a week left or right as needed to allow for work bundling to occur when appropriate while also including any carry-over work that was not completed in its original execution week along with balancing work order types with resource availability and loading.
When work is finalized in the schedule, the “Planned Start Date” shall be updated to the appropriate date and the status shall be updated from “Ready to Schedule” to “Scheduled”.

Checklist in Attachment 8.

c) Schedule Lock (T3)

The Final Preparations meeting is a weekly meeting typically scheduled on Friday for the work scheduled three weeks from the Monday of the current work week. This meeting provides a formal opportunity to review the schedule and ensure all stakeholders are aware and support the schedule as documented.

The final preparation phase has a two-week duration which allows for final preparations to be made as outlined in the “Final Preparations” section of this document. Should any procedures or permits not be approved during T3 effort should be made to get them approved before the T0 meeting that precedes the week of execution.

Once the schedule is validated by all stakeholders, the work orders shall have their status updated from “Scheduled” to “Approved.”

Checklist in Attachment 9.

d) Work Validation (T0)

The Work Validation is a weekly and final meeting before work execution. The meeting is typically scheduled the Friday before the week of execution to verify that all final preparations have been completed for the work that is to be executed the following week. All stakeholders should attend this meeting to fully understand the impact to the site for the next weeks work and de-conflict if any issues arise.

Once the final preparations have been finished, the work orders status will be updated to “Ready”.

The T0 meeting shall review all work in a “Ready” status to validate everyone is ready and aware for the following weeks work to commence as scheduled.

Checklist in Attachment 10.

Attachment 1:

Ambiguous Location Assignments

(PNB data center used as the example)

Building and Suite Designations for Shared Spaces needs standardizing

PNB Parking Lot area equipment:

- Building 1/2 should be PNB1, Suite 1X
- Building 3/4 should be PNB3, Suite 3X
- Building 5/6 should be PNB5, Suite 5X

AC1, AC2, H1, H2, Exhaust Fans, MUA units on Admin Roof:

- Building 1/2 should be PNB1, Suite 1X
- Building 3/4 should be PNB3, Suite 3X
- Building 5/6 should be PNB5, Suite 5X

Admin Area Equipment, including back hallway and Loading Dock:

- Building 1/2 should be PNB1, Suite 1E
- Building 3/4 should be PNB3, Suite 3E
- Building 5/6 should be PNB5, Suite 5E

Water Rooms:

- A/B water rooms should be Suite B
- C/D Water Rooms should be Suite C
- Core Water Rooms should be Suite E

Generators:

- Should be to their respective Suites, not to X.

All Substation Equipment:

- PNBX, Suite X

Guardhouses:

- GH1 should be PNB1, Suite 1X
- GH2 should be PNB4, Suite 4X
- GH3 should be PNB5, Suite 5X
- GH4 should be PNB6, suite 6x

Attachment 2:

Site Actors Template

Phase	Activity	Actor	Role	Site Designated Actor
Origination	Ensures all PM's are originating within a compliance window that aligns with the sites PM strategy	N/A	MPC	
	Ensures all project work orders are created to outline the scope of the project aligned with the RAMP Standard Cycle and RAMP Standard Roles & Responsibilities		FPM	
	Create work Requests to identify deficiencies within the DC campus	1	Everyone	
Planning	Aggregates the work order into a logical work breakdown structure and assigns planning groups	2	Site Specific	
	Define the sequence of execution within the WBS	2	Site Specific	
	Define the Planning Group for each activity within the WBS	2	Site Specific	
	Attach and/or author any procedures that are required to perform the work within the assigned activity in the WBS	N/A	Planning Group	Assigned Planning Group (i.e. SME, CFE, EH&S, CFT, etc)
	Identify Production Impact(s)		Planning Group	
	Identify what permits are required to perform the work (if applicable)		Planning Group	
	Identify if LOTO is required to perform the work		Planning Group	
	Define the role that will execute the work activity		Planning Group	
	Estimate work order activty durations based on analogous estimates		Planning Group	
Scheduling	Define the site resource loading percentage	3	Site Specific	
	Define the work type split within the resource loading percentage(s)	3	Site Specific	
	Identify available hours per role	3	Site Specific	
	Shift activities as needed in the scheduling phase across weeks as needed to bundle work to support efficient DC maintenance and operations	3	Site Specific	
	Change "Planned Start Date" to the day in the week that the work will occur. Update "Planned Finish Date" based on duration of work activity.	3	Site Specific	
	Validate work schedule does not conflict with any other work that is scheduled for the same time period.	3	Site Specific	
Final Preps	Verify any procedures identified for use are approved	4	Site Specific	
	Populate permits identified as required during the planning phase (if applicable) and route for approval as required	4	Site Specific	
	Create eLOTO record(s) to facilitate the work scope withing the work order (if applicable)	4	Site Specific	
	Verify access for any assigned vendors	4	Site Specific	
	Validate production impacts tasks are initiated for the "Planned Start Date"	4	Site Specific	
Execution	Complete the work order as defined and articulated in work order activities and procedures	5	Work Order Activity Assignee	Assignee by name or shift quadrant
	Update the work order activity status to "Complete" once finished	5	Work Order Activity Assignee	Assignee by name or shift quadrant
	Create a follow up work requests for additional work scope identified during execution	5	Work Order Activity Assignee	Assignee by name or shift quadrant
Close-Out	Update work order with appropriate comments	6	Work Order Activity Assignee	Person executing the work
	Attach any required documentation of historical significance	6	Work Order Activity Assignee	Person executing the work
	Provide any enhancements as needed for procedures, durations, etc.	6	Work Order Activity Assignee	Person executing the work
	Ensure time is appropriately charged to the work order	6	Work Order Activity Assignee	Person executing the work

Site Template can be found HERE

Attachment 3:

Owner Assignments for ambiguous locations

Parking Lot area equipment:

- Building 1/2 Owner:
- Building 3/4 Owner:
- Building 5/6 Owner:

Campus Areas

- Guard Houses:
  - GH1 Owner:
  - GH2 Owner:
  - GH3 Owner:
  - GH4 Owner:

- General Campus Owner:

All Substation Equipment: Owner:

Coordinator:

Attachment 4:

Work Priority Definitions

- **Unbreak:** Deficiency that prevents operations, impacts critical load, or adds an unacceptable level of risk or reduction in capacity. We should be staged to typically complete repairs within one (1) day. This WO type should be tracked in the Pass down. Notification/ Escalation to the CFM is required. Un-break now! (Black)

- **High:** Equipment/material Issue may have an impact on normal operations and should be fixed as soon as possible and within five (5) days. This is something that likely requires a change to the way you operate pending scheduling of the repair. This WO type should be tracked in the Pass down. Notification/ Escalation to the CFM is required. (Red)

- **Mid:** Equipment/material Issue does not currently impact normal operations but could be of a potentially significant nature if not repaired within the next two months. This is something that you actively monitor and complete within two (2) months. (Orange)

- **Low:** Equipment/material Issue of a minor nature. Does not impact normal operations. This is something that you fix when sufficient time and resources are available and within three (3) months. (Yellow) This is used for PM's.

Attachment 5:

Work Breakdown Structure

a) Creating a Work Breakdown Structure (WBS)
    a. Define the Objective
    b. Create a list of deliverables that support the execution of the objective
        i. Aggregate the deliverables to a single resource type or activity

Example:

- Objective: Perform MSB-12 Four Year PM

- Deliverables:
    - Activate Drains & Alarm Suppression
    - Isolate MSB-12 per SOP “X”
    - Install LOTO for control of hazardous energy
    - Perform MP-0446
    - Release LOTO
    - Restore MSB-12 per SOP “X”
    - Verify SOO per MP step “8.9”
    - Restore Loads to MSB-12 per SOP “Z”
    - De-Activate Drains & Alarm Suppression

b) Using our CMMS System, the WBS should be used to outline the objective, deliverable, resources and durations.

OPEN/CLOSED	Work Order Type: Preventative	Priority: Medium	Owner: Bob Evans	Compliance Window: February 1 - March 2, 2021			Work Order Status: Planning
Work Order Number:	Work Order Title						
858678	FRC1; Perform MSB-12 Four Year PM						
Activity:	Activity Title			Work Group	Role	Assigned	Duration (hrs)	Activity Status:
1	Activate Drains & Alarm Suppression			SiteOps	SiteOps	Fred Krueger	2	Planning
2	Isolate MSB-12 per SOP "X"			CFE	CFE	CFE	2	Planning
3	Install LOTO for Control of Hazardous Energy			CFE	CFE	CFE	3	Planning
4	Perform MP-0446			eSME	Vendor	Schneider Electric	12	Planning
5	Release LOTO			CFE	CFE	CFE	2	Planning
6	Restore MSB-12 per SOP "X"			CFE	CFE	CFE	2	Planning
7	Verify SOO per MP step "8.9"			eSME	eSME	Carol Baskin	1	Planning
8	Restore loads to MSB-12 per SOP "Z"			CFE	CFE	Bob Evans	1	Planning
9	De-Activate drains & Alarm Suppression			SiteOps	SiteOps	Fred Krueger	1	Planning
						Total Duration	24	
Subscribers:	Clint Hays, Jane Mundale							

Attachment 6:

Work Origination Meeting Checklist

Page 1 of 1

Objective: Identify work requests written since previous meeting and either validate prior to converting to work orders to place in the Work Management Process or action as work requests to execute outside of WM process

Time: As determined by each site

Quorum: Building CFM, Building CFE's, Lead SME's, FPM/FPE

Checklist:

- ☐ Identify work requests submitted since last meeting
- ☐ Validate the work requests are complete with all necessary information provided
- ☐ Ensure troubleshooting is complete, if required to fully understand the problem
- ☐ Ensure work is not a duplicate of another work request or work order
- ☐ Determine if this is to be worked in the WM process or action now

Deliverable:

- ☐ Work Orders that will be managed via the Work Management Process
- ☐ Work Orders in a "Created" status

OR

☐ Work Requests that are actionable via an updated status

Attachment 7:

Work Intake Meeting Checklist

Page 1 of 1

Objective: Select the work scope for the execution week based upon the priority and input from stakeholders.

Time: Prior to Work Scheduling meeting

Quorum: Building CFM, GC and/or Vendor CMOP Rep, MPC, Lead SME's, FPM/FPE

Checklist:

☐ Identify work orders in "Created" status to be planned and scheduled 8 weeks out
☐ Work within common systems, equipment and/or components have been bundled together for execution

Deliverable:

☐ Provide detailed work packages that identify scope, role of the performer and estimated duration
☐ Work orders in a "Ready to Schedule" status

Attachment 8:

Work Scheduling Meeting Checklist

Page 1 of 1

Objective: Review the final work scope, verify open issues are closed and identify work orders that are not ready to be scheduled.

Time: Prior to T-6 meeting

Quorum: Building CFM, GC and/or Vendor CMOP Rep, Site Ops, Prod Ops, ENS, Lead SME's, MPC, Security, FPM/FPE

Checklist:

- ☐ Work breakdown structure complete
- ☐ Verify work order is planned with procedures reviewed and approved
- ☐ Parts ordered and delivery dates identified
- ☐ Work order durations identified and are accurate for scope of work
- ☐ Available resources match resources required to do all the work
- ☐ Meeting stakeholders verify the work scope can be performed in the target work week

- [ ] Work on time sensitive systems can be performed in available time (drains, etc)
- [ ] Identify open Safety concerns
- [ ] Identify / Communicate High Risk activities
- [ ] Verify vendor support has been identified and scheduled for desired work week
- [ ] The MPC will have reviewed the schedule to ensure PMs are scheduled within their due dates, identify any PMs that are approaching overdue dates or are deep in the grace period
- [ ] Identify scheduled items that are removed, rescheduled, etc., in order to update the schedule

Deliverable:

- [ ] Final work week scope validated; packages planned resources available
- [ ] Work Orders are in a "Scheduled" status

Attachment 9:

Schedule Lock Meeting Checklist

Page 1 of 1

Objective: Participants should come to the meeting prepared to complete the checklist tasks or provide the required checklist information. Actions are assigned to develop a frozen schedule by the end of the T-3 meeting.

Time: Prior to the T-3 meeting

Quorum: Building CFM, GC and/or Vendor CMOP Rep, Site Ops, Prod Ops, ENS, Lead SME's, MPC, Security, FPM/FPE

Checklist:

- [ ] Identify any safety concerns associated with work in the week
- [ ] Review items added to the week directly, Sponsored Work process or by carryover for conflict with original scope. Confirm that scope additions can be planned and completed as scheduled

- [ ] Identify work which must be rescheduled due to schedule additions
- [ ] Determine operational impact of schedule moves
- [ ] Confirm parts status, either on site or to be delivered prior to work week
- [ ] Verify vendor support has been identified and scheduled for desired work week
- [ ] Remove or expedite tasks that do not have confirmed resolution of package preparation
- [ ] Identify / Communicate High Risk activities
- [ ] Verify resource loading is as desired (scheduled work hours against available work hours)
- [ ] Verify logic sequence for post maintenance testing (ex: LOTO removed then perform SOP)
- [ ] Scheduler bundles work such as annual and semi-annual surveillances on the same component
- [ ] Scheduler verifies work sequence, logic ties and constraints. i.e. De-term/RE-term; component removal/replacement
- [ ] CFE/CFM reviews existing clearances do not affect scheduled work
- [ ] CFE/CFM ensure alternate train can support data center operation/system function with train or component removed from service for maintenance
- [ ] Identify permits required for work (ex: energized work permit, confined space, red tags, etc)

Deliverable:

- [ ] All corrective maintenance, preventive maintenance, project work, and warranty work is scheduled and resourced to ensure success
- [ ] Work Orders are in an "Approved" status

Attachment 10:

Work Validation Meeting Checklist

Page 1 of 1

Objective: Participants should come to the meeting prepared to complete the checklist tasks or provide the required checklist information. Work groups are to certify their readiness to execute the next weeks schedule.

Time: Prior to the T-0 meeting

Quorum: Building CFM, GC and/or Vendor CMOP Rep, Site Ops, Prod Ops, ENS, Lead SME's, MPC, Security, FPM/FPE

Checklist:

- [ ] Confirm resource loading and crew assignments

- [ ] Review items added to the week directly, Sponsored Work process or by carryover for conflict with original scope. Confirm that scope additions can be planned and completed as scheduled
- [ ] Identify work which must be rescheduled due to schedule additions
- [ ] Confirm required parts to execute work week are available on site
- [ ] Identify / Communicate High Risk activities
- [ ] Verify LOTO and required permits have been completed for scheduled work

Deliverable:

- [ ] The work week schedule has been certified for the next week's execution
- [ ] Work Orders are in a "Ready" status

Attachment 11:

Standard Tag List

Work Order Types

1. Corrective
    a. Rework
2. Non-Corrective
    b. Quality Control
    c. Inspection
    d. Rounds
3. Predictive
    e. Condition Based Monitoring

Functional Group Types

1. Operations
    a. FBD
    b. HBD
    c. SLD
2. Mechanical
    a. Vibration
    b. Fracture
    c. Stress
    d. Emergency Generator
    e. Chillers

f. Run Time
g. Surveillance Testing
h. IR Scanning

4. Warranty

i. Construction Warranty
j. Corrective
k. Preventative

5. Training

l. Fit Out
m. Drills
n. All-Hands

6. Project

o. Rack Commissioning
p. Rack De-Commissioning
q. Network Commissioning
r. Network De-Commissioning
s. Infrastructure

3. Electrical

a. Medium Voltage
b. MSG-Alpha
c. MSG-Numeric
d. Low Voltage
e. Drain
f. Throttle
g. Re-Charge
h. Open Transition

4. Controls

a. Nuisance Alert
b. Offline Device
c. Controls
d. DCIM Tooling
e. PID Tuning
f. SOO Issue
g. Electrical Integration
h. BMS Graphics
i. BMS Servers
j. FDM Port Audit
k. Change Control
l. Device Failure
m. FacNet
n. Improvement Request or Wish List
o. Sensor or Parts Failure
p. Wiring Issue
q. Temporary Override
r. RAMP