

Patient-Focused Maintenance

Banner Health's Journey Towards Operational Optimization





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I believe empowered subject matter experts contribute to highperforming teams. My passion lies in inspiring others to grow—by sharing knowledge and advancing our collective understanding of healthcare facilities operations—so we all can better serve the patients (customers) who rely on us every day.



Agenda

- 1. Banner Health's CMMS Optimization Journey
- 2. Navigating the Healthcare Regulatory Landscape
- 3. The Power of Facilities Data Standards
- 4. Risk-Based Assessment & Program Eligibility
- 5. From Calendar to Condition-Based Strategies
- 6. Tools to Extend Asset Life & Reduce Cost

AUDIENCE



"in the event of decompression, an oxygen mask will automatically appear in front of you."

"If you are traveling with a child or someone who requires assistance, secure your mask on first, and then assist the other person."





Focused on Services to Others

"in the event of decompression, an oxygen mask will automatically appear in front of you."

"If you are traveling with a child or someone who requires assistance, secure your mask on first, and then assist the other person."

As a support/service department this is an important, yet foreign, message to internalize.





Vision – We will be Sofia's MOST TRUSTED Health Partner.

Decisions guided by Sofia

To help us design care with consumers in mind, we've identified a customer face who will represent the people we serve, Sofia. Sofia, short of time and money, coordinates care for herself and her extended family. If we design care to make things easier for Sofia, we can make life better for the thousands of people who interact with us each day. Meet Sofia and ask yourself, what can you do to make her life easier?



Samaritan Health Samari



Banner Desert

Expansion &

You never change things by fighting the existing reality. To Change something, build a new model that make the exiting model obsolete.

Buckminster Fuller

The Twelve Steps to CMMS Recovery



1 – Admit the Problem



5 – Program Eligibility



9- Assignment of Work



2 – Real Estate (Location & Space Data)



6 – Field & Form Standards



10 – Dashboards & Reporting



3 – Asset Nomenclature







11 – Capital Renewal



4 – Asset Risk Assessment



8 – Schedules & Frequency



12 – Continuous Optimization



Unpacking the Impact of July 5th, 2016



NFPA 99

1984 Edition 1987 Edition 1990 Edition 1993 Edition 1996 Edition 1999 Edition 2002 Edition 2005 Edition

2012 Edition 2015 Edition 2018 Edition 2021 Edition 2024 Edition

Unpacking the Impact of July 5th, 2016 – Continued



- 1. Prior to 2012, NFPA 99 was referred to as a standard, which simply meant "best practice"
- 2. The 2012 edition is a legally enforceable code
- 3. The rewrite of the document changed it from an occupancy-based document to a risk-based document
- The rewrite expanded the scope to include the evaluation of risk to staff and visitors as well – "patient, staff and visitors"

The Joint Commission (TJC) – Environment of Care (EOC)

EC.02.05.05 - The hospital inspects, tests, and maintains utility systems.

EC.02.05.05.04

The hospital inspects, tests, and maintains the following: High-risk utility system components on the inventory. The completion date and the results of the activities are documented.
 Note 1: A high-risk utility system includes components for which there is a risk of serious injury or even death to a patient or staff member should it fail, which includes life-support equipment.
 Note 2: Required activities and associated frequencies for maintaining, inspecting, and testing of utility systems components must have a 100% completion rate.

EC.02.05.05.05

 The hospital inspects, tests, and maintains the following: Infection control utility system components on the inventory. The completion date and the results of the activities are documented. Note: Required activities and associated frequencies for maintaining, inspecting, and testing of utility systems components must have a <u>100% completion rate</u>.

EC.02.05.05.06

• The hospital inspects, tests, and maintains the following: **Non-high-risk utility system components on the inventory**. The completion date and the results of the <u>activities are documented</u>.

Health Facilities Management (HFM) Magazine



INFRASTRUCTURE



Quantifying excellence for health care facilities

Data standardization project at Yale New Haven Health builds a foundation for better operations

October 12, 2020 | Matthias Ebinger



A meeting of the Health Care Facility Data Standardization working group.

Healthcare Facilities Data Standards (HFDS)

- Use of recognized industry standards
- Alignment with regulatory frameworks
- Standardized naming conventions and classifications



Healthcare **Facilities Data Standards (HFDS)**



ÍFGI	Building	A discrete physical entity composed of building systems and functional areas
,	Functional Area	A collection of spaces in a unit or interrelated units with persons and equipment that serve common
	Spaces	Either a room enclosed with walls or an area within a room with its own space identifier, such as a patient bay, cubicle, or workstation
ASHE	Building System	A grouping of one or more assets that work in unison to perform a specific function. A system may consist of mechanical equipment or structural building elements. Systems are operationally distinct from each other.
	Asset	A distinct element or an assembly of elements within a building system that requires the documentation of inspection, testing, and/or maintenance activities. Notes 1. An asset can be shared by more than one system. 2. The use of "asset" in this document aligns with the Joint Commission term "Operating Component" as used in EC.02.05.01 or EC.02.05.05.
	Sub-asset	A component of an asset. Examples of a sub-asset include a fan, motor, or a cooling/heating coil.
	Part	A consumable item for an asset, such as a belt, filter.





Classification of Building

Alignment with FGI Facility Types & EPA Property Types

FGI Facility Type	EPA Portfolio Manage	r Property Types	EPA Property Types, expanded with FGI Facility Types				
FGI Facility Type	💶 EPA Property Types Level 1 🛛 🔽 EPA Property Types Level 2		Proposed Healthcare Building Portfolio Lookup	Also known as:			
H-2.2 General Hospital	Healthcare	Hospital	Healthcare - Hospital				
H-2.3/OP 2.8 Freestanding Emergency Care Facility	Healthcare	Hospital	Healthcare - Hospital - Freestanding Emergency Care				
H-2.4 Critical Access Hospital	Healthcare	Hospital	Healthcare - Hospital - Critical Access Hospital				
H-2.5 Psychiatric Hospital	Healthcare	Specialty Hospital	Healthcare - Hospital - Psychiatric Hospital				
H-2.6 Rehabilitation Hospital	Healthcare	Specialty Hospital	Healthcare - Hospital - Rehabilitation Hospital				
H-2.7 Children's Hospital	Healthcare	Hospital	Healthcare - Hospital - Children's Hospital				
OP-2.2 General and Specialty Medical Services Facilities							
OP-2.2 Community-based clinic	Healthcare	Urgent Care/Clinic/Other Outpatient	Healthcare - Outpatient - Community-Based Clinic				
OP-2.2 Micro-clinic	Healthcare	Urgent Care/Clinic/Other Outpatient	Healthcare - Outpatient - Micro-Clinic				
OP-2.2 Multi-specialty medical clinic/office building	Healthcare	Medical Office	Healthcare - Medical Office - Multi-Specialty				
OP-2.2 Neighborhood clinic	Healthcare	Urgent Care/Clinic/Other Outpatient	Healthcare - Outpatient - Neighborhood Clinic				
OP-2.2 Physician practice	Healthcare	Medical Office	Healthcare - Medical Office - Physician Practice				
OP-2.2 Primary care center	Healthcare	Medical Office	Healthcare - Medical Office - Primary Care Center				
OP-2.2 Retail clinic	Healthcare	Urgent Care/Clinic/Other Outpatient	Healthcare - Outpatient - Retail Clinic				
OP-2.2 Single-specialty medical clinic/office building	Healthcare	Medical Office	Healthcare - Medical Office - Single-Specialty Medical				
OP-2.2 Sole practitioner clinic	Healthcare	Urgent Care/Clinic/Other Outpatient	Healthcare - Outpatient - Sole Practitioner Clinic				
OP-2.3 Outpatient Imaging Facility	Healthcare	Medical Office	Healthcare - Medical Office - Imaging Facility				
OP-2.4 Birth Center	Healthcare	Urgent Care/Clinic/Other Outpatient	Healthcare - Outpatient - Birth Center				
OP-2.5 Urgent Care Center	Healthcare	Urgent Care/Clinic/Other Outpatient	Healthcare - Outpatient - Urgent Care Center				
OP-2.6 Infusion Center	Healthcare	Medical Office	Healthcare - Medical Office - Infusion Center				
OP-2.7 Outpatient Surgery Facility	Healthcare	Ambulatory Surgical Center	Healthcare - Outpatient - Surgery Facility				
OP-2.9 Endoscopy Facility	Healthcare	Medical Office	Healthcare - Medical Office - Endoscopy Facility				
OP-2.10 Renal Dialysis Center	Healthcare	Medical Office	Healthcare - Medical Office - Renal Dialysis Center				
OP-2.11 Outpatient Psychiatric Center	Healthcare	Medical Office	Healthcare - Medical Office - Psychiatric Center				
OP-2.12 Outpatient Rehabilitation Therapy Facility	Healthcare	Outpatient Rehabilitation/Physical Therapy	Healthcare - Outpatient - Rehabilitation Therapy Facility				
OP-2.14 Dental Facility	Healthcare	Medical Office	Healthcare - Outpatient - Dental Facility				
R-3.1 Nursing Home	Healthcare	Residential Care Facility or Senior Care Facility	Healthcare - Residential Care - Nursing Home	- Convalescent Home - Long-Term Care - Rest Homes - Retirement Home - Memory Care Center - Dementia Care Center - Skilled Nursing Home			
R-3.2 Hospice Facility	Healthcare	Residential Care Facility or Senior Care Facility	Healthcare - Residential Care - Hospice Facility	End-of-Life Care Hospice House Elder Hostel Hospice Care Convalescent Home Rest Homes			
R-4.1 Assisted Living Facility	Healthcare	Residential Care Facility or Senior Care Facility	Healthcare - Residential Care - Assisted Living Facility	 Intermediate Care Facility Retirement Community Retirement Home Care Facility Senior Living Facility 			



Classification of Space

Grouping	Space Name	Abbreviation	🚽 2018 FGI Hospital Reference	Comments	ASHRAE 170 Addendum P
Patient Care	BMH Patient Bedroom	PAT-RM	2.5-2.2.2		
Patient Care	Continuing Care Nursery	NRSY-CC	2.2-2.10.3.2		Continued care nursery
Patient Care	Intensive Care - Patient Room	ICU	2.2-2.6.2.2 (1)		Intensive care patient care station
Patient Care	Intermediate Care Room	IMC	2.2-2.5.2		Intermediate care patient room
Patient Care	Medical Psychiatric Patient Room	PAT-RM-BMH	2.2-2.2.4.6		
Patient Care	Newborn Nursery	NRSY	2.2-2.10.3.1		Newborn nursery
Patient Care	NICU AII	NICU	2.2-2.8.4.2		All room
Patient Care	NICU Multiple-Infant Room	NICU-MULTI	2.2-2.8.2		Neonatal intensive care
Patient Care	NICU Parent/Infant Room	NICU-PARENT	2.2-2.8.10.2		Neonatal intensive care
Patient Care	NICU Single-Infant Room	NICU-SINGLE	2.2-2.8.2		Neonatal intensive care
Dationt Cara	Datiant Observation Station	OBC	2.2-3.2.2,	Second FCI reference is to hohewieral health crisis up	
Patient Care	Patient Observation Station	OBS	2.2-2.17.2 (2022 Guidelines)	Second For reference is to behavioral health crisis un	ll l
Patient Care	Patient Room	PAT-RM	2.1-2.2		Patient room
Patient Care	Patient Room – Airborne infection isolation (AII)	PAT-RM-AII	2.1-2.4.2		All room
Patient Care	Patient Room - Burn Trauma Intensive Care	PAT-RM-BURN	2.2-2.16 (2022 Guidelines)		Wound intensive care (burn unit)
Patient Care	Patient Room - Combination All/PE	PAT-RM-AII-PE	2.2-2.2.4.5		Combination AII/PE anteroom
Patient Care	Patient Room - PE	PAT-RM-PE	2.2-2.2.4.3		Protective environment room
Patient Care	Postpartum Room	POSTPARTUM	2.2-2.9.2.2		Patient room
Patient Care	Seclusion Room	SECLUSION	2.1-2.4.3		Seclusion room
Patient Support	BMH Child Activity Area	ACTIVITY-CHILD	2.5-2.3.3		
Patient Support	BMH Kitchenette	PAT-KIT	2.5-2.2.8.9 (2)		
Patient Support	BMH Patient Bathing Facilities	PAT-TUB	2.5-2.2.7		
Patient Support	BMH Patient Laundry Facilities	PAT-LDRY	2.5-2.2.10.3		
Patient Support	BMH Patient Storage	STRG-PAT	2.5-2.2.8		
Patient Support	BMH Patient Toilet Room	TLT-PAT	2.5-2.2.6		Patient toilet room
Patient Support	BMH Quiet Room	QUIET-RM	2.5-2.2.4.4		
Patient Support	BMH Social Space	SOCIAL	2.5-2.2.10.2		
Patient Support	Nourishment Area or Room	NOUR	2.1-2.8.9		Nourishment area or room
Patient Support	Outdoor - Activity Area	ACTIVITY-OUTDR	2.5-2.2.3		
Patient Support	Patient Bathing Facilities (Central)	PAT-TUB	2.2-2.2.2.7 (2)		
Patient Support	Patient Belonging Storage	STRG-PAT	2.6-2.2.2.8, 2.1-2.2.8		
Patient Support	Patient Changing Room or Area	PAT-DRESS	2.2-3.3.10.3, 2.2-3.4.10.3		



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20094234 - CHWP-3 - NA	Subcategory <u>Facility</u>	Pump >2.5hp - Chilled Water Motor - Ocotillo	- Primary			TMA5 Type TMA5 Subtype	e Plumbing Pump (Pipe Moun	ted)				
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Establishing an Asset Nomenclature (Hierarchy)

Blending Industry Standards with Risk Classification

- MasterFormat 2018
- UniFormat 2010
- OmniClass Tables 21

ARMS Asset Categories (Plain Language)	ASHE Asset Categories (Plain Language)
HVAC - Ventilation	D. HVAC - Ventilation - Exhaust Air - (System) Exhaust Air
Commercial-Kitchen Hood - Type 1 - Grease Applications	D. HVAC - Ventilation - Exhaust Air - Kitchen Hood
Commercial-Kitchen Hood - Type 2 - Condensate Applications	D. HVAC - Ventilation - Exhaust Air - Exhaust Fan
Exhaust Air - General/Toilet Fan Assembly - Non-Patient Care Area	D. HVAC - Ventilation - Exhaust Air - Exhaust Fan - Toilet
Exhaust Air - General/Toilet Fan Assembly - Patient Care Area	D. HVAC - Ventilation - Exhaust Air - Exhaust Fan - Laboratory / Biohazard
Exhaust Air - Hazardous Fan Assembly	D. HVAC - Ventilation - Exhaust Air - Exhaust Fan - HEPA Filtered
Exhaust Air - HEPA Filtered Fan Assembly	D. HVAC - Ventilation - Exhaust Air - Exhaust Fan - Isolation
Exhaust Air - Isolation Fan Assembly	D. HVAC - Ventilation - Exhaust Air - Exhaust Fan - Kitchen Hood
Exhaust Air - Kitchen Fan Assembly - Type 1 Grease Application	D. HVAC - Ventilation - Exhaust Air - Kitchen Hood - Wash System
Exhaust Air - Kitchen Fan Assembly - Type 2 Condensate Applications	D. HVAC - Ventilation - Exhaust Air - Laundry Dryer Exhaust Vent
Exhaust Air - Laundry Dryer Vent Fan Assembly	D. HVAC - Ventilation - Exhaust Air - Exhaust Fan - Helium
Exhaust Air - MRI Quench Fan Assembly	D. HVAC - Ventilation - Exhaust Air - Exhaust Fan - Radiology
Exhaust Air - Smoke Evacuation Fan Assembly	D. HVAC - Ventilation - Exhaust Air - Exhaust Fan - Smoke Purge

Asset Risk Management System (ARMS)

COMPLIANCE + OPERATIONS

Developing an asset risk management system

ASHE has a created a tool to help members manage valuable assets and pass compliance surveys

January 23, 2020 | Ryan Schramm, CHFM, CHC



The computerized maintenance management system used by the health care facility may drive the asset data used in determining risk.

Quantifying Risk – Asset Risk Management System (ARMS) 2.0

Variables

- Community Impact CI
- Financial Impact/Burden FI
- Operational Impact OI
- Location(s) Served / Environmental Use Env
- Equipment / System Redundancy Rd
- Equipment / Utility Function Fn
- Infection Control IC
- Impact to Patient, Staff or Visitor Imp

Imp – Criteria & Values

- Category 1 Major Injury or Death (likely to result in major injury or fatality) = 15
- Category 2 Minor Injury (could result in minor injuries) = 12
- Category 3 Minor Discomfort (not likely to cause injury but may lead to discomfort) = 4
- Category 4 No Impact (would not affect patient care or pose any safety risk) = 1

$$\operatorname{Risk} = \left(\frac{CI + FI}{OI} \cdot \frac{Env}{Rd} \cdot Fn\right) \cdot (IC + Imp)$$

Classification of Equipment Assets | HVAC – Ventilation

Subcategory Position 3 + Position 4 + Position 5	Impact to Patient, Staff or Visitor Imp	Infection Control IC	Equipment / System Redundancy Rd	Location(s) Served/Environmental Use	Operational Impact OI	Financial Impact/Burden Fi	Community Impact Cl	Equipment / Utility Function Fn	Risk Score	Risk Value
Commercial-Kitchen Hood - Type 1 - Grease Applications	Category 3 - Minor Discomfort (not likely to cause injury but may lead to discomfort)	Category 4 - Low-Risk (no impact)	Level I - N Base-level	Patient Care Support (Medium Risk)	Significant Impact (disruption to nonessential operations requiring escalation)	Substantial Cost (requires additional resources/staffing to maintain operations)	High Impact (likely to impact delivery of essential services)	Critical	466.67	Non-High Risk
Commercial-Kitchen Hood - Type 2 - Condensate (Non-Grease) Applications	Category 4 - No Impact (would not affect patient care or pose any safety risk)	Category 4 - Low-Risk (no impact)	Level I - N Base-level	Non-Patient Care (Low Risk)	Significant Impact (disruption to nonessential operations requiring escalation)	Substantial Cost (requires additional resources/staffing to maintain operations)	Minor Impact (loss of ancillary services without affecting access to care)	Non-Critical	24.00	Non-High Risk - Low
Exhaust Air - General/Toilet Fan Assembly - Non-Patient Care Area	Category 4 - No Impact (would not affect patient care or pose any safety risk)	Category 4 - Low-Risk (no impact)	Level I - N Base-level	Non-Patient Care (Low Risk)	Limited Impact (minimal operational inconvenience)	Minimal Cost (limited or negligible cost to restore/recover)	No Impact (no impact on access to care)	Non-Critical	9.60	Non-High Risk - Low
Exhaust Air - General/Toilet Fan Assembly - Patient Care Area	Category 3 - Minor Discomfort (not likely to cause injury but may lead to discomfort)	Category 3 - Moderate-Risk (minimal impact)	Level I - N Base-level	Patient Care (High Risk)	Manageable Impact (disruption to operations without escalation)	Minimal Cost (limited or negligible cost to restore/recover)	Minor Impact (loss of ancillary services without affecting access to care)	Non-Critical	300.00	Non-High Risk - Low
Exhaust Air - Hazardous Fan Assembly	Category 2 - Minor Injury (could result in minor injuries)	Category 1 - High-Risk (essential for maintaining IC)	Level I - N Base-level	Patient Care Support (Medium Risk)	High Impact (disruption to essential operations requiring a multidisciplinary response)	Substantial Cost (requires additional resources/staffing to maintain operations)	Moderate Impact (likely to impact delivery of nonessential services)	Infection Control	4860.00	High Risk - Critical
Exhaust Air - HEPA Filtered Fan Assembly	Category 2 - Minor Injury (could result in minor injuries)	Category 1 - High-Risk (essential for maintaining IC)	Level I - N Base-level	Patient Care (High Risk)	Significant Impact (disruption to nonessential operations requiring escalation)	Minimal Cost (limited or negligible cost to restore/recover)	Minor Impact (loss of ancillary services without affecting access to care)	Infection Control	6750.00	High Risk - Critical
Exhaust Air - Isolation Fan Assembly	Category 2 - Minor Injury (could result in minor injuries)	Category 1 - High-Risk (essential for maintaining IC)	Level I - N Base-level	Patient Care (High Risk)	High Impact (disruption to essential operations requiring a multidisciplinary response)	Substantial Cost (requires additional resources/staffing to maintain operations)	Moderate Impact (likely to impact delivery of nonessential services)	Infection Control	12150.00	High Risk - Critical
Exhaust Air - Kitchen Fan Assembly - Type 1 Grease Application	Category 3 - Minor Discomfort (not likely to cause injury but may lead to discomfort)	Category 4 - Low-Risk (no impact)	Level I - N Base-level	Patient Care Support (Medium Risk)	Significant Impact (disruption to nonessential operations requiring escalation)	Substantial Cost (requires additional resources/staffing to maintain operations)	High Impact (likely to impact delivery of essential services)	Critical	466.67	Non-High Risk
Exhaust Air - Kitchen Fan Assembly - Type 2 Condensate (Non-Grease) Applications	Category 3 - Minor Discomfort (not likely to cause injury but may lead to discomfort)	Category 4 - Low-Risk (no impact)	Level I - N Base-level	Non-Patient Care (Low Risk)	Significant Impact (disruption to nonessential operations requiring escalation)	Substantial Cost (requires additional resources/staffing to maintain operations)	Minor Impact (loss of ancillary services without affecting access to care)	Non-Critical	60.00	Non-High Risk - Low
Exhaust Air - Laundry Dryer Vent Fan Assembly	Category 4 - No Impact (would not affect patient care or pose any safety risk)	Category 4 - Low-Risk (no impact)	Level I - N Base-level	Non-Patient Care (Low Risk)	Limited Impact (minimal operational inconvenience)	Minimal Cost (limited or negligible cost to restore/recover)	No Impact (no impact on access to care)	Non-Critical	9.60	Non-High Risk - Low
Exhaust Air - MRI Quench Fan Assembly	Category 1 - Major Injury or Death (likely to result in major injury or fatality)	Category 4 - Low-Risk (no impact)	Level I - N Base-level	Patient Care Support (Medium Risk)	High Impact (disruption to essential operations requiring a multidisciplinary response)	Substantial Cost (requires additional resources/staffing to maintain operations)	High Impact (likely to impact delivery of essential services)	Critical	2240.00	High Risk
Exhaust Air - Smoke Evacuation Fan Assembly	Category 1 - Major Injury or Death (likely to result in major injury or fatality)	Category 2 - Moderate-High Risk (potential to indirectly impact IC)	Level I - N Base-level	Patient Care (High Risk)	Significant Impact (disruption to nonessential operations requiring escalation)	Substantial Cost (requires additional resources/staffing to maintain operations)	Moderate Impact (likely to impact delivery of nonessential services)	Life Safety	8100.00	High Risk - Critical



Reliability-centered vs Calendar-based vs Code Required

© Reliability-centered Maintenance (RCM)

RCM focuses on maintaining system functionality by identifying potential failure modes, evaluating their impact, and applying the most effective maintenance strategies to prevent or mitigate those failures.

Calendar-based Maintenance (CBM)

CBM involves replacing, renewing, or servicing equipment at predetermined time intervals—regardless of its current condition or performance. It's based on a schedule, not the actual wear or need.

Code Required Inspection & Testing (CRIT)

CRIT is a schedule-driven, regulatory-based approach designed to ensure compliance with applicable laws, codes, and accreditation standards. It plays a vital role in minimizing risk, supporting operational readiness, and maintaining safety and compliance across critical systems.

NOT a Maintenance Program



Reliability-centered Maintenance (RCM)

- RCM is a process used to determine the optimum maintenance strategy to prevent failures and minimize losses.
- Originating in the airline industry in the 1960s, RCM improves safety and reliability by evaluating systems based on seven key questions.
- RCM strategies may include:
 - 🜔 Reactive
 - 🏢 Preventive
 - 📈 Predictive (condition-based)
 - 📔 Planned run-to-failure
 - 🎄 Failure finding maintenance.

Work Types

Maintenance:

- Preventive/Planned Maintenance
 - Time-Directed
 - Condition Based
 - Failure Finding
 - Run-to-Failure
- Corrective Maintenance

Service Requests:

- Planned Events
- Web Requests





PLANNED MAINTENANCE (PM)

PLANNED EVENT (PE) **CUSTOMER OPERATIONS** PROACTIVE PREVENTATIVE REACTIVE COMPLIANCE SERVICE REQUEST **PROACTIVE MAINTENANCE PREVENTIVE/PLANNED REACTIVE/BREAKEDOWN CODE-REQUIRED INSPECTION &** PLANNED EVENT SERVICE REQUEST MAINTENANCE MAINTENANCE TESTING Proactive maintenance leveraging interval or Includes scheduled or on-demand activities Encompasses service-related requests focused on resolving issues or fulfilling immediate demands. real-time analytics to foresee equipment failures Planned routine maintenance to ensure Intentional/planned response to equipment A regulatory-driven initiative focused on essential for managing facility operations. These by analyzing historical and current data trends. non-routine tasks are planned to prevent issues It's crucial for validating unscheduled work that equipment reliability and prevent failures through compliance and is essential for meeting failures or breakdowns as the arise. accreditation requirements and minimizing risk and ensure optimal performance and continuity. addresses the needs of our customers and Sofia. (WE ANTICIPATE IT) proactive management (WE RESPOND TO IT) (WE DISCOVER IT) (WE PROACTIVELY PLANNED) (AD HOC OR ON-DEMAND SUPPORT) (WE ENSURE COMPLIANCE) **On-Demand – Rounding Planned - Run-To-Failure Preventative – AEM Code-Required Customer Support** (ODRD) **On-Demand - Operational** (PAEM) (RPTF) **Inspection & Test (CRIT)** Involves unscheduled rounds (CSUP) (ODOE) Time-directed practices ensure A deliberate approach of inaction until Calendar-based inspection and testing performed as needed, often in On-demand activities address non-Begins with a service request, consistent maintenance across similar equipment failure, aiming for repair on systematically evaluate systems and response to environmental changes, to prioritized into a work order. Ensures routine needs via planned work orders demand. This approach is used when equipment from different ensure equipment functions properly equipment to meet accreditation comfort, safety, and efficiency through to maintain performance, prevent manufacturers. failure poses no risk to safety, during uncertainty requirements. issues, and ensure continuity troubleshooting and problem-solving, operations, or compliance. **Life Safety Manager** aligned with our mission. **Proactive – Rounding Preventative – Mfr. Recs Scheduled - Operational** (LSMG) (PMFR) (PRRD) **CORRECTIVE MAINTENANCE On-Demand - Facilities** (SCHE) Inspecting and testing of life safety systems This involves follows manufacturer (CORR) Involves planned rounds for inspecting Planned operational tasks scheduled at (fire a larms, sprinklers, HVAC, emergency **Refresh (ODFR)** Involves reactive repairs or replacements due to equipment, identifying potential guidelines to maintain equipment, power) using the ATG Life Safety Manager regular intervals to maintain efficiency Department or customer driven request unexpected equipment failures, essential for preserving performance and ensuring issues early, and ensuring timely (LSM) app to ensure compliance. prevent issues, and ensure smooth restoring functionality and ensuring operational to plug, patch, paint, and handle moves, maintenance to prevent failures. warranty validity. continuity facility operations. adds, or changes to maintain and adapt (EQUIPMENT OR SYSTEM REPORTS IT) **Utility Equipment Manager** the physical environment. **PROACTIVE / PREVENTIVE REPAIR Proactive - Cond-Based Planned - Facilities** (UEMG) (PPRT) **Reactive - CM Repair** (PRCB) Inspecting and testing of utility equipment **Refresh (PREF) Key** v3.2 - 3.1.25 Repairs to restore functionality and maintain (RCMR) (fire pumps, generators, transfer switches, Non-invasive assessments conducted operational continuity before unexpected failures Facilities Refresh includes plug, patch, elevator recall) using the ATG Utility Addresses emergency repairs triggered (EQUIPMENT OR SYSTEM REPORTS IT) Service Request submitted by a to evaluate equipment health and and paint, as well as moves, adds, and Equipment Manager (UEM) app to ensure by sudden failures, often due to reacting to changes in equipment customer or by a Facilities changes (MAC) to maintain and adapt reliability and compliance. Prevent Maint Repair Task ineffective or missed maintenance. conditions as they occur **Operations team member on** the physical environment. (PMRT) focusing on restoring operation after their behalf Low Technology Events involves repair activities breakdowns. **Clinic Program Training and Education** Utilizes handheld devices to obtain readings Service Request or Work Order identified during routine preventive (CLPR) **Initiated by a Facilities Operations** (TRED) maintenance or service request such as **High Technology** The Ambulatory Clinic Program PREVENTIVE COMPLIANCE REPAIR Equips team members with the team member Utilizes fixed sensors to obtain real-time readings replacing worn components or clearing TASK (PCRT) oversees life safety equipment testing knowledge and skills needed through clogged filters, to ensure proper Restore functionality and uphold accreditation Work Order initiated by a Facilities to ensure compliance at clinics without training, workshops, certifications, and equipment function. compliance upon identification of a deficiency. Operations team member or auto-ATG access. ongoing education, fostering compliance **Proactive - Predictive** (TESTING OR INSPECTION REPORTS IT) generated by TMA7 due to an **Proactive Repair – MBCx** safety, and professional growth. identified deficiency(s) (PRPD) **Accreditation C & P** (MBC_x) **Compliance Repair Task** Non-invasive monitoring aimed at (ACCP) **Project Support** Banner Health's strategy for monitoring-(CPRT) Work Order auto-generated by assessing equipment health by Ensures compliance and preparedness based commissioning. When equipment (PSUP) TMA7 based on a predetermined Corrective actions from code-required analyzing data trends to predict a through scheduled activities like fire deviates from optimal parameters, the Project meetings, contractor support, schedule inspections, testing, or accreditation future change in condition ROC BMS team issues an MBCx work drills, water management testing, project-related work orders (typically programs, addressing deficiencies to Program Placeholder, not a Service **High Technology** order to ensure timely repairs, performance tracking, and vendor initiated post-meeting), and ensure compliance with regulatory Utilizes fixed sensors to obtain real-time readings

maintaining efficiency and reliability.

standards

inspections per regulatory standards.

commissioning.

Request nor a Work Order



D-I-P-F CURVE (DESIGN-INSTALLATION-POTENTIAL FAILURE-FAILURE)



DESIGN/BUY

- 1 Design for Reliability (DFR)
- 2 Purchase for Purpose

PRECISION

- 1 Precision Commissioning
- 2 Precision Installation
- 3 Defect Elimination
- 4 Precision Alignment and Balancing
- 5 Work Processes and Procedures
- 6 Asset Condition Management
- 7 Lubrication Reliability
- 8 Clean to Inspect (5S)
- 9 Operate for Reliability

PREDICTIVE

- Condition Directed Tasks
- 2 Ultrasound Testing (UT)
- 3 Fluid Analysis (FA)
- 4 Vibration Analysis (VIB)
- 5 Motor Testing (MT)
- 6 Infrared Imaging (IR)
- 7 Non Destructive Testing (NDT)

PREVENTIVE

- 1 Time-Directed Tasks
- 2 Human Senses (audible noise, hot to touch, smell)

FAILURE

- Functional Failure
- 2 Catastrophic Failure

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Preemptive Investment vs. Reactive Costs



Cost Benefit Potential

Investment

> Avoidance of future beak/fix expense

Collateral effects of reactive maintenance

We exist to improve the physical environment to support earning Sofia's trust.

Roundtable