What about Day 2?
Transitioning from Construction to Operations

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Introduction

Construction projects have standard approaches and processes. Facility operations, management and compliance also have standard approaches and processes. Many hospitals lack a solid process of transitioning from a construction project to operations and compliance. This affects the staff's ability to manage systems and puts the hospital at risk of noncompliance with codes, standards, rules and regulations. This paper is intended to bridge the gap between construction and operations, providing an overview of the facility operations, management, and environment of care (EC) compliance issues and needs for Day 2 – the day after a facility opens.

Changing activation and turnover approaches

Early approaches to facility activation and turnover focused on the logistics of acquiring and installing new equipment and furniture, along with the facility to house it. When the facility neared completion, teams would start scheduling the building turnover sequences - department moves and patient moves.

Current thinking about new facilities involves much more than what must fit into it and how the facility will work. Now healthcare administrators might decide that the new facility must resolve concerns about existing service delivery shortcomings. Furthermore, they want the new facility to incorporate best practice operational models.

Facility activation challenges, limitations and planning issues

There are many challenges in healthcare facility activation. Among them are managing the risks – the economic, operational, patient safety, and compliance risks. It is a challenge in a complex undertaking of this nature to minimize the duration of the work while meeting all regulatory compliance requirements by initial occupancy. If the project is a Construction/Renovation (C/R) project in an existing healthcare campus, it is necessary to manage the impact of the activation

work on existing facility operations. Planning and coordinating ongoing patient care is challenging while simultaneously focusing on new facility activation. Finally, it is necessary to budget realistically for facility start-up and understand the impact of the new facility on the existing operating budget.

Whether or not the facility activation team members have other responsibilities (in an existing facility) team members will still face limitations during the facility activation process. These limitations can include the necessity to stop all visioning. Any improvements or desired changes that are not already in the project will probably not be able to be made without delaying acceptance. It will be necessary for the team that faces this challenge to prioritize its goals. Teams are also cautioned to be wary of committing to new operational procedures and standards that are not required by the new facility since the increased complexity of dealing with the changes themselves might be too much until after the new facility is occupied.

Facility activation planning issues are both logistical in nature and operational in nature. Logistical planning issues are usually somehow facility-related – that is they involve building turnover; acquiring, installing and commissioning new equipment and furniture; moves and sequencing of detailed interrelated activities. All of these issues and related tasks are accomplished with available resources while (hopefully) adhering to schedules and approved budgets. Facility activation operational issues usually involve planning for the modified processes and practices that will be necessary in the new facility. These operational issues could affect all functions, departments and areas. They might be a result of intended changes (form follows function in architectural parlance) or unintended consequences (function follows form) and will require detailed implementation to be effective. [1, 2]

Facility activation success factors and best practices

Professionals in the field of healthcare facility activation planning report that there are often common factors evident in successful facility activations. These success factors include having an activation project *champion* who can bring about the necessary timely organizational cooperation and who is supported by multi-disciplinary teams that have clear roles and responsibilities in the activation process. These teams are each led by strong team captains. The teams work together to develop and integrate the cross-functional processes that are necessary. Because there is a great deal of upwards, downwards and sideways communication, it is helpful for the participants to have both meeting management and conflict management skills. Activation success factors also include having clear project objectives supported by realistic scheduling and planning. There must be consistent real-time communication. A "move hotline" is also a helpful feature.

More complex facilities can experience many activation issues, not all of them bad. Keeping commonly-encountered activation issues in a database and reflecting their solutions in published

[1] "Activation and Operational Planning: Ensuring a Successful Transition" by Mark N. Wilson, William J. Hejna, and James E. Hosking, *Journal of Healthcare Management* 49:6, Nov/Dec 2004, Replacement Facilities.
[2] "Hospital Facility Activation" by Kerry Shannon, Computer Sciences Corporation (CSC), Waltham, MA, www.csc.com. 2009

frequently-asked questions (FAQs) is also often a factor in successful activations. Many issues will require decisions. Making these decisions rapidly and then communicating those decisions rapidly to all affected personnel are also important success factors. [3]

The 2008 ASHE Planning Design and Construction Committee recently developed and posted online (www.ashe.org) a detailed new spreadsheet entitled "Pre-move and Occupancy Coordination Checklist." It includes detailed lists of items to be funded and tracked as organizations prepare to move into new facilities. The content of this checklist is not repeated in detail in this paper. The author recommends that those interested in this topic obtain and review the ASHE checklist.

Education and training

Education and training are always important in healthcare facilities, but never more so than in new facilities or in newly-expanded facilities where there are changes to be understood. These changes include the new facilities, building systems and equipment, new practices, and new operational plans. Training includes dry runs, drills and exercises on clinical issues such as codes and surgery, utility systems issues such as failure contingencies, and other emergency management-related issues.

Training of both users and maintainers is necessary on new equipment and technologies because there will likely be redesigned processes requiring new policies and procedures (P&P's). Existing maintenance management work orders may be outdated as a result of new technologies and it might be necessary to revisit utility component failure contingency plans due to new system equipment and configurations. Previously-used training materials must be reviewed to ensure that they are available, still accurate, and sufficiently cover the new infrastructure. User acceptance testing can take the approach of trying to see just how robust the new systems are by performing negative testing designed to "break the system." [4]

Training includes readiness for dealing with security incidents, issues with both facility systems and clinical systems, issues with other equipment and systems, all hazardous material and waste related requirements, use of personal protective equipment (PPE), and appropriate fire response procedures. Both facility staff and licensed independent practitioners (LIP's) need to be trained in EC risks, incidents, and reporting. Finally, all designated personnel need to be trained in emergency management functions and requirements.

Facility start-up and acceptance testing

Facility start-up involves testing of all mechanical, electrical, plumbing, fire protection and low voltage systems. It also of course includes detailed testing, adjusting and balancing of HVAC

[3] "Healthcare Facility Activation Planning" by Kerry Shannon, Carmin Hunter-Siegert, and Walt Zywiak, *Healthcare Facility Activation Planning and Testing*, Computer Sciences Corporation (CSC), www.csc.com, Falls Church, VA 2008

[4] "Healthcare Facility Activation Planning" by Kerry Shannon, Carmin Hunter-Siegert, and Walt Zywiak.

systems. Decisions need to be made on renting or purchasing test equipment or including it in the Contractor's scope of work. Start-up also includes obtaining and thoroughly reviewing all new operations and maintenance (O&M) manuals and information as well as the as-built drawings. Facility start-up also includes finalizing and proving out all system operating descriptions.

New healthcare facilities require acceptance testing of most of the infrastructure systems and equipment. This testing is required by regulatory compliance commitments and due diligence considerations. A recommended proactive approach to such testing involves what one organization has called "proactive avoidance" (confirming what was ready and identifying what was not ready in time to fix it) before issues require delays in occupancy. [5]

Building systems should be tested under full load and together, also sometimes called *integrated system testing*, to ensure that they all work together. During system testing, it is helpful to verify patient safety, comfort, and convenience. It is also helpful from an emergency management perspective to test both the operators and the systems, under both normal and abnormal operating conditions. All of this is intended to confirm that all tested areas are ready to go live. Test scripts should be as comprehensive as possible, including all potential operational contingencies and all specified parameters. It is necessary to ensure that all equipment and system interfaces are correctly defined, carried out and understood. All component and system failure contingency plans need to be verified, which means that they should be finalized before final acceptance testing occurs.

Organizations should use the command center for activation management and move control; recording both problems and their resolutions. Any issues that are found and resolved should be retested to verify that the facility is fully ready.

Proactive regulatory compliance

A corollary to the approach of proactive avoidance acceptance testing would be "proactive compliance." Rather than finding what is wrong and fixing it, proactive compliance involves determining what is needed and when it is needed for compliance, identifying what is missing in time to get it, and then thoroughly managing this process. Proactive compliance recognizes that "continuous compliance" could include an unannounced accreditation survey shortly after occupancy.

Proactive compliance includes identifying all anticipated authority having jurisdiction (AHJ) reviews and surveys along with their timeframes. Required activities and documentation can then be scheduled and completed in time to comply with AHJ timeframes. It will be necessary for the organization to determine whether it can do all of the compliance work in-house or requires some outside assistance. If outside assistance is required for licensing or survey support it will also have to be proactively managed. Some organizations may decide that their own resources are best used supporting the process of getting the new facility occupied and do not

[5] "Healthcare Facility Activation Planning" by Kerry Shannon, Carmin Hunter-Siegert, and Walt Zywiak.

have the time to do the detailed compliance activities, where others may decide that their own personnel can do all of the required compliance work.

It is necessary to identify all of the required documentation, and who in the C/R project team "owns" (is already responsible for) each item. If disconnects (missing items not already "owned") are found after this initial compliance review is done, then they will need to be scheduled and arranged for, again in time to support AHJ timeframes including a survey shortly after occupancy. The best situation occurs when the compliance requirements related to the initial inspections, testing, documentation and training are factored into project construction documents – that is to ensure that project record documents are survey-ready when received on time to support an early survey. This approach leverages already scarce resources by assuring that facility personnel do not need to spend time or funds redoing what the Contractor has already done to make it survey-ready.

Proactive compliance also recognizes that accrediting agencies are not just looking for project record documentation on that first survey – they will also be looking to ensure that the C/R project's impact has been accurately and fully defined in all activities, drills, exercises, management plans, policies, procedures, schedules, forms, and related documentation. This includes all elements related to accreditation, although this paper only addresses elements related to the EC, life safety, and emergency management responsibilities.

Unfortunately, all too many healthcare construction projects reflect one or more of the following conditions about some of the compliance-related project record documentation:

- The work never gets done.
- The work gets done but is not accurately documented.
- The work gets done and gets accurately documented, but that documentation does not meet the AHJ's rules.
- The work gets done, gets accurately documented, the documentation is acceptable, but it does not arrive on time for an early AHJ survey.

Any AHJ accreditation survey, including an unannounced survey shortly after facility occupancy, will likely involve surveyors requesting to review the following:

- Portions of project record documentation, such as the contractor's or commissioning agent's test & inspection reports, permits, licenses, manifests, certifications & AHJ approvals.
- Organization documentation that includes the impact of the recently-completed C/R project, such as management plans, P&P's, risk assessments, training records, inputs into P&P's from O&M manuals, evaluations, inventories, lists, spreadsheets, databases, schedules and forms for ongoing required drills, exercises, tests, inspections and maintenance, and all required emergency management and emergency operations plan (EOP) input, analyses and activities.
- Life Safety Code™ related documentation such as the Life Safety Assessment™ and accurate life safety plans, eSOC™, any Plan for Improvement items, and performance-based options for new construction (equivalencies.)
- Evidence of required onsite personnel protective equipment (PPE), spill kits, monitoring equipment and other supplies.

The management plans, policies and procedures need to reflect changes to facilities and areas, changes to infrastructure equipment and systems, new operational and infrastructure-related processes, and department locations or relocations.

The risk assessments could include the following:

- Safety
- Security
- Fire
- Where patient smoking is to be permitted
- Medical equipment
- Utility systems operating components
- Emergency power
- Input to emergency management / EOP and hazard vulnerability analysis
- Hazardous chemicals
- Hazardous energy sources, (including radiation, lasers, batteries)
- Hazardous medications
- Hazardous gases & vapors
- Radioactive materials
- LSC deficiencies: ILSM
- Demolition and C/R preconstruction risk assessments
- Infection control risk assessments

Written inventories would include either all of the below-listed areas or selected subsets based upon risk. Additionally, a fire extinguisher inventory might be considered if desired to manage the ongoing fire extinguisher inspection process.

- Hazardous materials and waste
- Medical equipment (evaluation prior to initial use)
- Operating components of utility systems (evaluation of new component types prior to initial use)

Systems and equipment, including life safety building features or components, must be commissioned and/or tested prior to initial use. It is not practical to list all such items here. Presumably project record documentation that meets the AHJ requirements for information would be acceptable if they are available during survey.

The project record documentation can be helpful in providing the complete list of components for ongoing testing. The following systems and components require ongoing testing, and there would have to be policies, procedures, requirements, and forms that detail this testing:

- Fire safety equipment
- Fire safety building features
- Fire alarm
- Fire protection and sprinklers
- Fire extinguishers and extinguishing systems
- Smoke and fire dampers

- Air handling unit shutdown, elevator recall, etc.
- Door operation
- Exit door and corridor door resistance
- Medical equipment on the inventory
- Operating components of utility systems on the inventory
- Emergency power systems and equipment
- Medical gas and vacuum systems and equipment
- Pathogenic biological agents in cooling towers, hot water and cold water systems
- Temporary systems required for Interim Life Safety Measures (ILSM)

Project testing and certification reports would have to be on file and easily accessible during unannounced surveys. Types of project-related testing and certification reports could include, but are not limited to, the following:

- Contractor documentation
- Commissioning agent documentation
- Documentation of the following AHJ inspections and approvals: Local, State, NRC, DOT, FAA, etc.
- Helipads and separator tank
- Building automation system / building management system
- Elevators
- Fuel tanks
- Pressure vessels
- Lightning protection systems
- Low voltage systems, both medical and otherwise
- Fire protection water systems

Schedules (and P&P's, forms, lists etc.) would have to be established for the following types of items, which is <u>not</u> all-inclusive:

- Fire drills
- Safety rounds
- Safety monitoring of EC
- Security monitoring of EC
- Ongoing testing
- Ongoing inspections
- Ongoing maintenance
- Inspections of all 'previous' BMP components (smoke & corridor walls, fire smoke & corridor doors, exit signs, egress lights, trash and linen chutes, grease producing devices, means of egress free of ice and snow)
- Inspections of fire walls
- Fire alarm systems, devices and equipment
- Fire protection systems, devices and equipment
- Fire and smoke Dampers
- Fire extinguishers
- Eyewash stations

- Emergency power, medical gas and vacuum, and other systems

Labeling would be expected for the following:

- Hazardous materials and waste
- Utility system controls to facilitate partial or complete emergency shutdowns
- Medical gas and vacuum system valves
- Maps (if used)
- Both permanent and temporary signage

Project record documentation that meets the AHJ requirements for mapping of utility systems would be acceptable if it is available during survey.

- Electrical: Normal and Emergency Power
- Steam and chilled water
- Water, Plumbing, Piping, and Fire Protection
- Medical Gas and Vacuum
- Fire Alarm & Emergency Communication
- Telecom
- Other systems included in the utility systems management plan scope

Utility maintenance documentation is required to be accessible during survey. This includes documentation generated both internally and by outside services. The organization needs to have processes (and contract provisions) to obtain, store and access all such documentation during both equipment failures and unannounced surveys. The decision process for the types of maintenance (preventive, predictive, reliability-centered, corrective, or metered) to be performed on all new equipment should also be documented and available.

Similar requirements apply to maintenance documentation for other types of equipment, including equipment serviced by both internal biomedical engineering departments and external service organizations.

About the author: David Stymiest has spoken at over a dozen ASHE conferences and dozens of state conferences, written and updated two major ASHE documents, and over 20 magazine articles. Before joining SSR, David was Senior EE for over 10 years for Massachusetts General Hospital and the other hospitals of Partners HealthCare System, Inc. He has spent almost half his 37 year career as an Owner and hospital engineer. He can be reached at *DStymiest@ssr-inc.com*. Cell 504.232.1113