Commissioning Operations & Maintenance Best Practices

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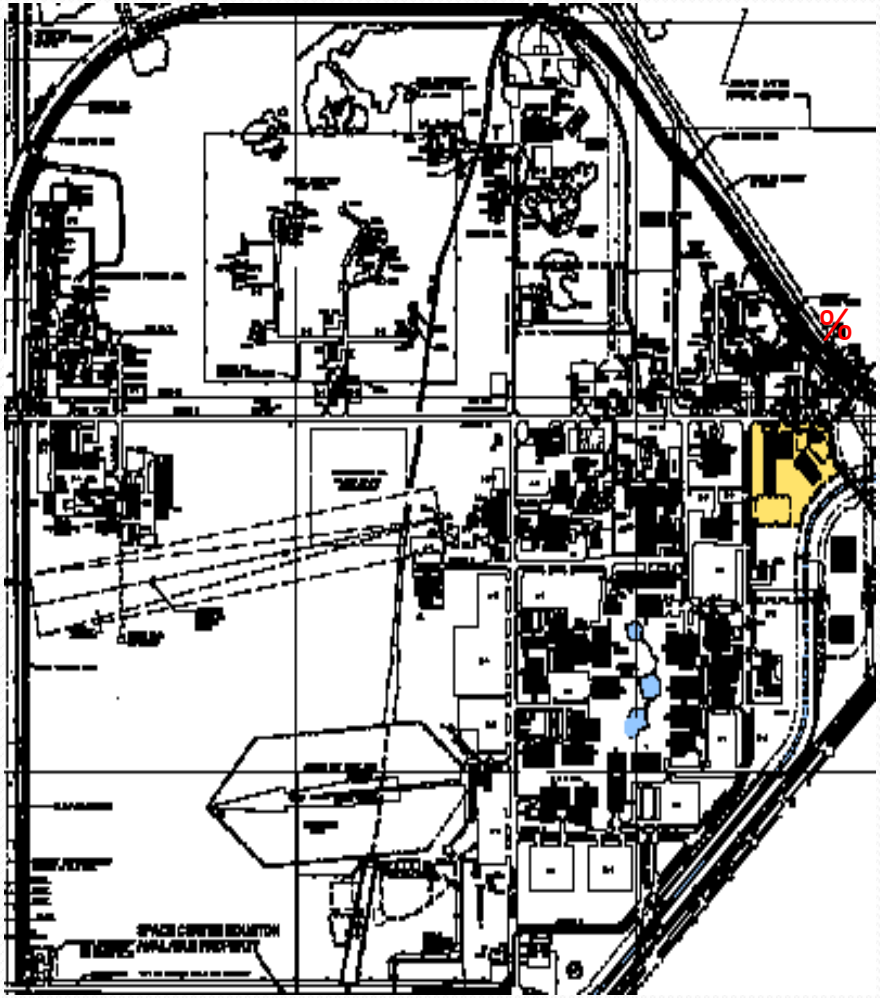
JSC Facilities

Johnson Space Center (JSC) = 200 Structures/Buildings; 1,620 Acres

Over 80% of Facilities are more than 40 years old



FAQ’s

- Why do I need commissioning after construction?
- What benefit does the project receive?
- How much does it costs?
- How long do I continue commissioning?

Why do I need commissioning after construction?

- Now that I have my project construction finished why do I need commissioning to continue? Look what its got me now!!

What benefit does the project receive?

Satisfied occupants

Certification and verification on a periodic schedule that the systems designed and installed are continuing to function at the level as required by the owner/operations.

Maximum return of energy dollars!

Minimum Call backs and revisions to the operations systems.

How long do I continue commissioning?

- Verify that systems are functioning to the energy efficiency designed and installed.
- It is a continuous program in order to ensure maximum efficiency for maximum duration.

Case Studies - Problem

- Building 27 – Astronaut Quarantine Facility
- Was completed and turned over for use by Astronauts for STS – 114. This was the first Shuttle Mission after the Columbia Shuttle Disaster.
- One year after turn over Owner extremely unhappy.
- Systems were not functioning as required. Hot and Humid Spots and Cold and Humid Spots through out the building.

Building 27 Astronaut Quarantine Facility

Building 27 Astronaut Quarantine Facility

Case Studies

- ACTIONS
  - Get Final Commissioning Report
  - Verify settings

Case Studies

- SOLUTIONS
  - Re-train Maintenance Personnel on operations
  - Keep updated file (Videos, Slide Presentations, etc.)
  - Update Commissioning Plan for any changes made

Case Studies – Lessons Learned

- Tremendous turn-over of maintenance personnel
- Constant Training required
- Days of Maintenance Personnel walking around with a pipe wrench in one hand and Ball Pin Hammer in the other are over
- Systems are much more complicated and require constant vigilance to maintain to achieve energy efficiencies.

Case Study - Problem

- Building 2 North Public Affairs Facility
- Underfloor Air Distribution System not cooling or heating, many hot/cold zones.
- Air Handlers way out of design Range (too much CPM)

Building 2 North Public Affairs

Lobby Area

Floor Sealing

Wall Penetrations

Case Study

- ACTION
  - Review installation submittal
  - Verify all openings sealed
  - Verify CPM/Static Pressure Design Requirements

Case Study

- SOLUTION
  - During construction phase diligently verify all openings in walls, floors, etc. are properly sealed. Includes electrical conduits penetrating wall boxes, underfloor conduits sealed at junction boxes, etc.
  - During start-up if appropriate use smoke to identify trouble spots.
  - Monitor and coordinate with the venders, installers and maintenance personnel

Case Study – Lessons Learned

- Underfloor Distributed Air Systems are very sensitive to leakage. Extra Careful Inspections during construction and extra care during occupancy is a must.
- Every penetration, no matter how small impacts the Static Pressure and thus impacts the efficiency of the total system.

Reference

- Building Commissioning Association