

COMMISSIONING

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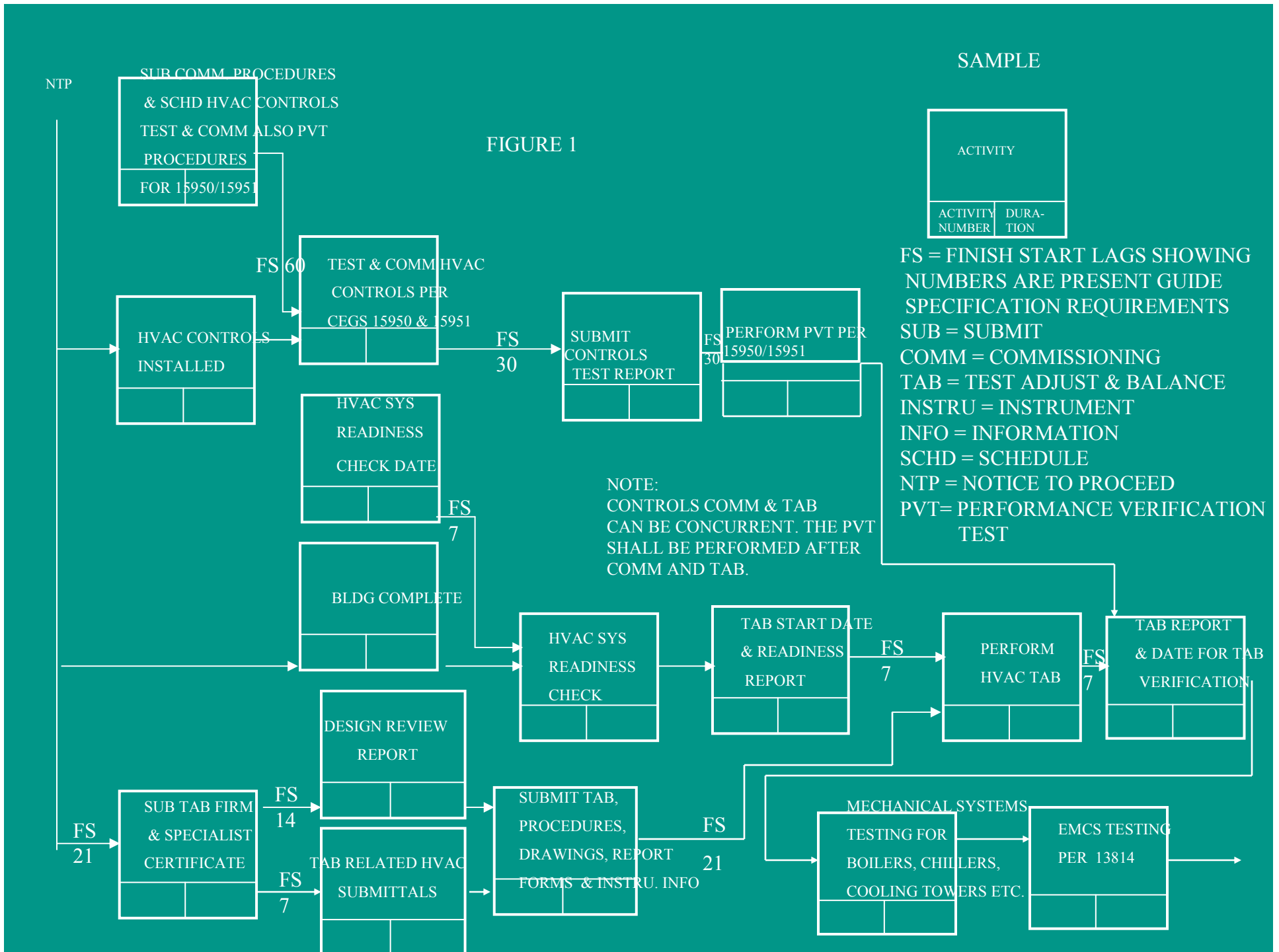
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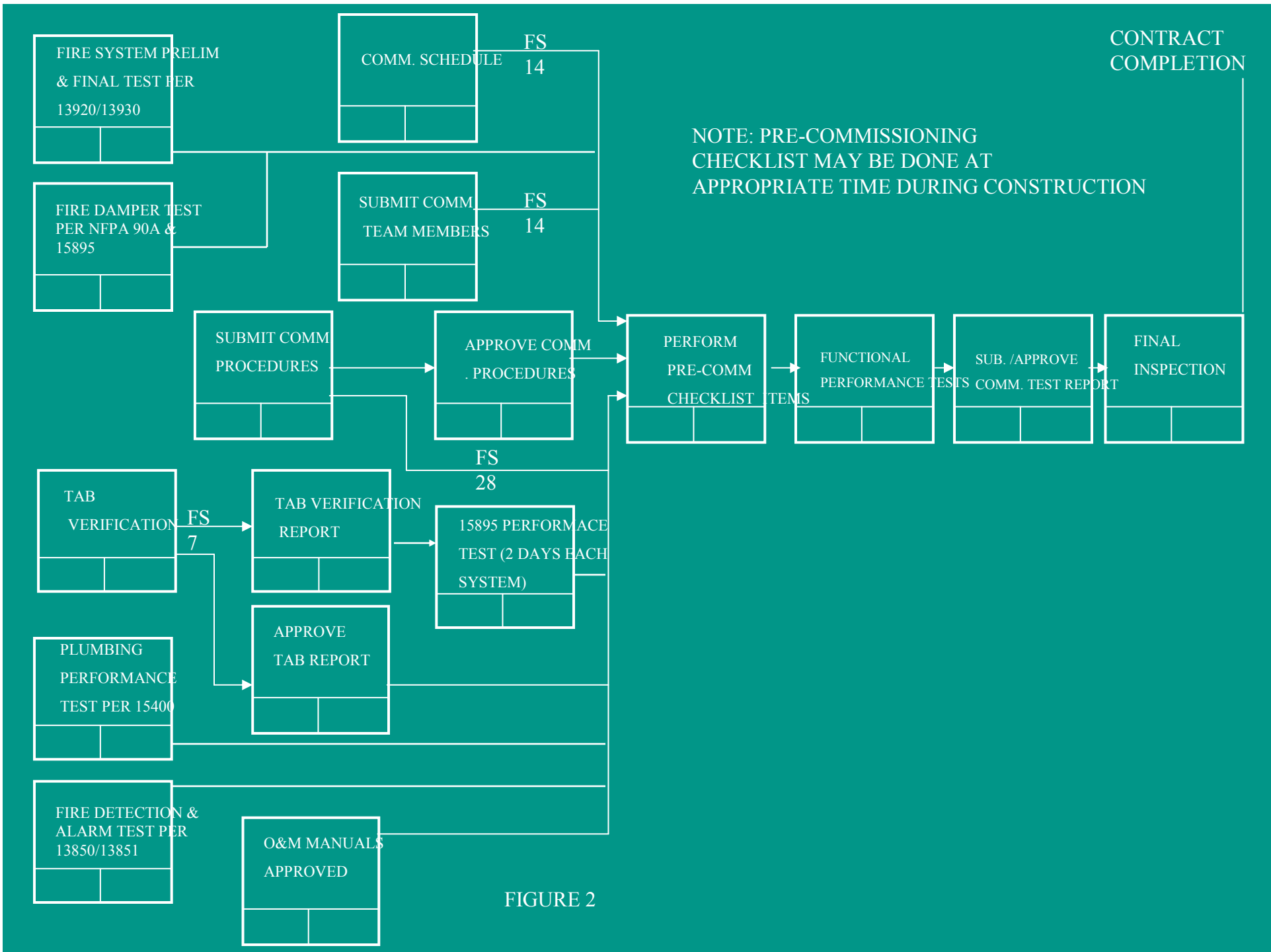
WHY? --- COMMISSIONING GOALS

- *Improve system performance*
- *Lower operating and maintenance costs*
- *Lower repair costs*
- *User comfort, safety & IAQ*
- *Owner quality verification*
- *Conforms with design intent*

CONSTRUCTION PROBLEMS

- *Commissioning Schedule & Cost*
- *Design deficiencies*
- *Construction deficiencies*
- *Product quality*
- *HVAC controls operation*
- *Energy*





INTRODUCTION

- *Building commissioning - HVAC, plumbing, electrical, fire protection*
- *Pre-design, design, construction, acceptance, post-acceptance*

ASHRAE GUIDE 1-1996

- *Pre-design*
Planing Meetings
- *Design*
BCO Reviews
- *Construction*
QA/QC
- *Acceptance*
Final Testing
Verification
- *Post-acceptance*
Warranty

UFGS – 15995A

- *Commissioning team*
- *Required @ contract completion*
- *After 15950 & 15990 is complete*
- *After all tests, reports & O&M Manuals*
- *Repetitive inspection & testing*
- *Pre-commissioning checklists*
- *Functional performance checklists*

PRE-COMMISSIONING

- *Installation Checklist*
- *Required by Contract at Job Completion*
- *Should be Performed as Scheduled?*
- *Perform Control & Electrical Testing Later?*
- *Contractor to Complete Master Checklist*

FUNCTIONAL PERFORMANCE

- *System Testing Checklist*
- *COE Requires Repetitive Testing*
 - *Pre-commissioning Checks*
 - *Functional Performance Tests*
- *Other tests are independent from 15995*
- *Tests aborted if not completed correctly*
- *Contractor covers cost of retesting*
- *One Complete Certified Test?*

FUNCTIONAL PERFORMANCE Cont.

- *All items listed on checklists*
- *Test only after Pre-com completed*
- *Prove all modes of sequence/operation*
- *Verify all relevant contract requirements*
- *Start with equipment/components*
 - *Progress through subsystems*
 - *To complete systems*
- *Correct all failures retest w/no errors*

Commissioning Team

- *Contractor/QC*
- *Contractor/Mechanical*
- *Contractor/TAB*
- *Contractor/Controls*
- *Contractor/Electrical*
- *Designers Agent*
- *COR*
- *User/Owner*

TESTING

- *Mechanical System*
- *HVAC System*

MECHANICAL SYSTEMS

- *Cooling*
- *Heating*
- *Air distribution & TAB*
- *Controls & EMCS*
- *IAQ*
- *Energy*

MECHANICAL SYSTEMS

- *Refrigeration systems*
 - *Chilled water pipe testing*
 - *Backflow prevention device*
 - *Refrigerant pipe testing*
 - *Cooling tower tests*
 - *System performance tests*
 - *Condenser water quality tests*
 - *Inspections after first year*

MECHANICAL SYSTEMS

- *Hot water heating systems*
 - *Backflow prevention device*
 - *Test during winter conditions*
 - *Pressure test piping system*
 - *Operational test*
 - *Water treatment test*
 - *First year boiler/piping inspection*
 - *Boiler flushed and cleaned*

MECHANICAL SYSTEMS

- *Air supply and distribution*
 - *Ductwork leak test*
 - *Cleaning and adjusting*
 - *TAB*
 - *Performance tests*
 - *Field training*

HVAC SYSTEMS

- *Control systems*
 - *Start-up Test*
 - *Coordination with hvac balancing*
 - *Calibration, adjustment and start-up*
 - *Performance verification test*
 - *Posted and panel instruction*
 - *Training course*

FUTURE WHERE ARE WE GOING?

- *100% Design Build (Transformation)*
 - *30 page RFP (No user requests)*
 - *All COE Guide Specifications eliminated*
 - *Design Review 95% (1-2 day only)*
 - *A/E responsible for QA*
 - *Delete contractor supplemental QC's*
 - *COE become Code Inspectors*
 - *Very few submittals*
 - *Build it like downtown (type 5 construction)*

FUTURE WHERE ARE WE GOING?

- *HVAC Commissioning per ASHRAE 1*
 - *States it is for Design-bid-build*
 - *Commissioning Agency is independent contractor and works for owner under separate contract*
 - *Includes other systems besides HVAC*
 - *Commissioning Agent starts at design through construction to acceptance to post acceptance commissioning*
 - *What role for COE?*

FUTURE WHERE ARE WE GOING?

- *HVAC Commissioning per NEBB, AABC, or TABB*
 - *Contractor required to hire Commissioning Agent*
 - *Increase Contract Cost*
 - *Includes other systems besides HVAC*
 - *Commissioning Agent starts at design through construction to commissioning to post commissioning (off season testing)*
 - *What role for COE?*

FUTURE WHERE ARE WE GOING?

■ *OVERVIEW*

- *Appears that COE not responsible for quality*
- *Appears COE responsible for acceptance testing*
- *Since Contract oversight minimized, S&A may be reduced*
- *Reduce & consolidate design sections throughout COE. Standardized RFP's, very little design review, and hardly any in-house design*
- *Customer Satisfaction?*