COMMISSIONING GUIDE SPECIFICATIONS

**SECTION 15998
PREFUNCTIONAL CHECKLISTS**

MECHANICAL and ELECTRICAL

Spec writer:

The following guide specifications are intended to be reviewed, modified and inserted into the noted specification section to meet the specific commissioning needs and requirements for the current project. Any modifications to these specifications shall only be made after consultation with the Owner's representative and with approval of the engineer of record. Where there are check boxes or fill-in blanks, fill in as appropriate and delete all but the choice(s) that apply. Delete all direction boxes.

SECTION 15998

PREFUNCTIONAL CHECKLISTS

MECHANICAL and ELECTRICAL

A.   GENERAL

This section contains representative Prefunctional Checklists in a form format (PC).

The PC procedures displayed in a form format here are intended to provide the CA with an example of a format and an indication of the rigor of the required prefunctional checklists and documentation for various equipment types. Though they were not developed specifically for this project, they are generally applicable.

The checklists contain items for both Division 15 and 16 contractors to perform. On each checklist, a column is provided that should be filled out by the Contractor assigning responsibility for that line item to a trade. Those executing the checklists are only responsible to perform items that apply to the specific application at hand. These checklists do not take the place of the manufacturer's recommended checkout and start-up procedures or report. Some checklist procedures may be redundant of some checkout procedures that will be documented on typical factory field checkout sheets. Double documenting is required in those cases.

Refer to Section 17100 for additional requirements regarding prefunctional checklists, startup and initial checkout. Items that do not apply should be noted along with the reasons on the form. If this form is not used for documenting, one of similar rigor and clarity shall be used. Contractors assigned responsibility for sections of the checklist shall be responsible to see that checklist items by their subcontractors are completed and checked off. "Contr." column or abbreviations in brackets to the right of an item refer to the contractor responsible to verify completion of this item. A/E = architect/engineer, All = all contractors, CA =

commissioning agent, CC = controls contractor, EC = electrical contractor, GC = general contractor, MC = mechanical contractor, SC = sheet metal contractor, TAB = test and balance contractor.

B. PREFUNCTIONAL CHECKLISTS

Spec Writer: Select one or two sample checklists and include in this specifications section for reference.

The prefunctional checklists referred to in this section are found later in the document under the "Prefunctional Checklists" tab.

The checklists are provided in electronic file format (Word 6.0 for Windows 3.1). The file name is at the bottom of each page. The file name extension "pc__" stands for Prefunctional Checklist and the last digit is the version number. Any MS Excel spreadsheet files are noted with their usual .xls extension.

COMPONENT   ELECTRONIC FILE NAME

Mechanical Equipment (checklists have both mechanical and electrical trade responsibilities)

Component	Electronic File Name
Air handler unit	ahu.pc_
Air cooled condenser and compressor	aircndsr.pc_
Boiler	boiler.pc_
Calibration procedures (sensors; actuators)	calibdir.pc_
Chiller	chiller.pc_
Chiller system sample startup documentation plan	chilrdoc.pc_
Chilled water piping	chwpipe.pc_
Computer room AC unit	computac.pc_
Condenser water piping	cdwpipe.pc_
Controls system (BAS)	controls.pc_
Cooling tower	cooltwr.pc_
Exhaust fan	exh_fan.pc_
Fan coil unit	fancoilu.pc_
Heating water piping	hwpipe.pc_
Packaged roof top unit	pkgunit.pc_
Pump (water)	pump.pc_
Startup documentation plan template	startpln.c08
TAB	tabplan.pc_
Terminal unit	tu_pc06.xls
Variable frequency drive	vfd.pc_

C. SUGGESTED NUMBERING KEY FOR COMMISSIONING PROCEDURES

The checklists, functional tests, documentation and training use the following identification numbering:
At the beginning of the identification number is a text abbreviation for the following:

Document or Event Abbreviations
DOC   = Documentation

PC = Prefunctional Checklist
SP = Startup Plan
SR = Startup Report
FT = Functional Test
R = Review
TR = Training Record

<u>Prefunctional Checklist Numbering Key</u>
FT-0102.3: The first four digits uniquely identify the piece of equipment to the component level. The first 2 digits are the System Type, the second 2 digits are an arbitrary component number (not necessarily the same as the specified ID number). The number after the decimal is the test number. For example, FT-0102.3 = Functional Test 3 of system Type 1, component number 2 (e.g., 0102.3 = Chiller #2, FT #3, because chillers are system Type 1). Other components under chillers are: additional chillers, pumps, valves, piping; VFDs. The component number of 00 means "general" or "all" components, as with the entire system. All tests, procedures, trainings and records should have the same first 4 digits for any given equipment component.

Another example. If there were only 1 TU type, then tests would be numbered FT-0500.1, 0500.2, etc. If there were 2 TU types TUs: FT-0501.1, 0501.2, etc and 0502.1, .2 etc.

An *example* of the number system follows:

0100	Chilled Water System	0200	Boiler System
	0101 Chiller 1		0201 Boiler 1
	0102 Chiller 2		0202 Boiler 2
	0103 Cooling tower 1		0203 Pump HWP-1
	0104 Cooling tower 2		0204 Pump HWP-2
	0105 Pump CHWP-1		0205 HW piping
	0106 Pump CHWP-2		0206 Sensor calibration
	0107 CHW piping	etc.	
	0108 CDW piping		
	0109 Sensor calibration		

<u>Numbers for Primary System Types and Components</u>
  Components are in parentheses.
01   Chilled water system (chillers, cooling towers, pumps, condensers, piping, valves)
02   Hot water system (boilers, hot water pumps, valves, piping)
03   Air handler units (SF, RF, coils, valves, VFD, ducts, dampers)
04   Packaged, AC or HP units (SF, RF, coils, valves, VFD, ducts, dampers, compressors, condensers)
05   Terminal units
06   Computer room AC units
07   Unit heaters or AC spot coolers
08   Heat exchangers
09   Service water system
10   Test and balance (TAB)
11   Building automation system (controls)
12   Lighting controls
13   Specialty fans

14   Fume hoods

END OF SECTION