

**INTERPRETATION IC 90.1-1989-9 OF  
ASHRAE/IES STANDARD 90.1-1989  
ENERGY EFFICIENT DESIGN OF NEW BUILDINGS  
EXCEPT LOW-RISE RESIDENTIAL BUILDINGS**

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**Request from:** Laurie E. Reid, P. Eng., Commercial Programs Department, Ontario Hydro, 777 Bay Street, 26th Floor, Toronto, Ontario, Canada M5G 2C8.

**References:** This request refers to ASHRAE/IES Standard 90.1-1989, section 9.4.10.1 Completion Requirements.

**Background:** Section 9.4.10.1 reads: "An operations and maintenance manual shall be provided to the building owner. The manual shall include basic data relating to the operation and maintenance of HVAC systems and equipment. Required routine maintenance actions shall be clearly identified. Where applicable, HVAC controls information such as diagrams, schematics, control sequence descriptions, and maintenance and calibration information shall be included."

**Question:** It is common to provide operating and maintenance manuals for the individual HVAC equipment, but not for the HVAC systems as a whole. Does this section require schematics of the systems as a whole as well as an outline of annual maintenance procedures?

**Answer:** Yes, depending on the complexity of the HVAC system design.

**Comment:** The wording of Section 9.4.10.1 is necessarily general because of the wide range of complexity of HVAC systems, from window air conditioners at one end to large central plants and air handling systems built up from several different types of equipment on the other. The intent of this section is to provide to the owner all information necessary to properly operate the system as a whole, not just each piece of equipment. If the system is very complex, requiring coordination among several pieces of equipment, the proper operating instructions, setpoints, etc. must be specified and included in O&M documents. This is usually done in control system design documents, such as system schematics and control sequence descriptions. For simple systems, such as small individual unitary equipment, a detailed system description is not necessary to operate the system properly and thus need not be included in the O&M manual.