



# ASHRAE GUIDELINE

## Documenting HVAC&R Work Processes and Data Exchange Requirements

Approved by the ASHRAE Standards Committee on June 26, 2010, and by the ASHRAE Board of Directors on June 30, 2010.

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#### NOTE

Approved addenda, errata, or interpretations for this guideline can be downloaded free of charge from the ASHRAE Web site at [www.ashrae.org/technology](http://www.ashrae.org/technology).

**(This foreword is not part of this guideline. It is merely informative and does not contain requirements necessary for conformance to the guideline.)**

## FOREWORD

There is a pressing need in the Heating, Ventilation, Air-Conditioning, and Refrigeration (HVAC&R) industry as well as the building industry at large for rapid and accurate exchange of information about a building project's equipment and components. During early design, for example, performance and approximate cost information is needed to evaluate system equipment alternatives. At later design stages, specific dimensions and mounting details are required for preparation of drawings and construction documents. In a bidding situation, binding price information is needed. During functional testing and operation, records of actual performance and maintenance are required. In a single project, these activities involve many participants (owners, designers, vendors, operators, and consultants) and typically span many years. Figure 1 shows some representative exchanges that typify activity in a hypothetical building project.

Currently, project information is exchanged using ad-hoc formats. Vendors provide specifications in proprietary formats; analysis tools, such as loads calculation software, require specialized input; and building owners maintain operational records using schemes of their own devising. As project information management is increasingly automated, this inefficient and error-prone "Tower of Babel" situation is rapidly becoming untenable.

This problem is obviously not unique to the HVAC&R industry. In recent decades, many standardized schemes for automated information exchange have been put forward and used with various degrees of success. Recently, interest and activity in the area of Building Information Modeling (BIM), including XML (eXtensible Markup Language) and related technologies, is rapidly increasing because of its potential to offer structured information representation and a processing framework that can be adapted to virtually any domain. Thus it is essential that ASHRAE, as the focus of HVAC&R expertise, assume a central role in enabling BIM and automated information exchange in the HVAC&R field. Guideline 20 outlines a process for meeting this need.

Guideline 20 provides guidance on the specifics required for implementing BIM and automated data exchange within ASHRAE's domain, with particular focus on HVAC&R equipment and related services. First and foremost, Guideline 20 defines a method for specifying data exchange requirements to support specific HVAC&R professional activities. Central to this method is the "use case," a formalized process activity description that facilitates identification, definition, and documentation of specific data elements that must be exchanged among participants in support of the described process activity. The use case documentation guidelines contained herein are targeted to ASHRAE domain experts rather than data modeling or software implementation experts. Domain expert data exchange requirements are a necessary first step in the development of

consistent automated data exchange implementations in software applications that pertain to the HVAC&R field.

Guideline 20 references an initial set of use cases that serve as examples of data exchange requirements expressed in HVAC&R domain expert terminology. This initial set of use cases provides a starting point for what is necessarily an ongoing process. It is a huge task to specify compatible, commonly accepted data exchange definitions for all activities within the HVAC&R domain. The only approach that can possibly succeed is a decentralized, yet coordinated, iterative process. Initial efforts will admittedly be incomplete.

In light of this, the bulk of Guideline 20 is devoted to a procedure for developing HVAC&R-related use case data exchange requirements. The initial set of use cases, newly developed use case documents, and collated lists of use case elements will be archived on the Guideline Project Committee (GPC 20) Web site<sup>1</sup> as working annexes. GPC 20 will also work to move developed use case documents through necessary subsequent stages of data modeling expert review, the development of formal data definitions, and their implementation in HVAC&R industry software. These additional stages are necessary to achieve the benefits of automated information exchange, but they are currently outside the scope of Guideline 20.

See Section 4, Process Overview, for an explanation of the structure and intended use of this document.

## 1. PURPOSE

To define a systematic procedure for documenting work processes (*use cases*) and *data exchange requirements* for specific HVAC&R activities.

## 2. SCOPE

This Guideline

- a. defines methods for documenting use cases and data exchange requirements related to HVAC&R activities involving equipment, systems, design services, and other services over the lifecycle of capital facilities. Use case documentation will employ domain expert terminology and a consistent format to facilitate review and adoption by industry participants.
- b. outlines procedures for Web-based management of use cases to support development of formal data definitions and implementation in HVAC&R industry software.

## 3. DEFINITIONS

This section contains definitions only for unique terminology used within this guideline. Terminology defined within the use cases produced by performing the process presented in this guideline are specifically excluded from this section and may be found within the *data dictionary* documents maintained on the GPC 20 Web site.<sup>1</sup> Related efforts in terminology definition are ongoing within other parts of ASHRAE, and links to these related efforts can also be found at the GPC 20 Web site.<sup>1</sup>