

REQUIREMENTS FOR COMMISSIONING HVAC SYSTEMS USING BEMS AND COMMISSIONING THE BEMS ITSELF BASED ON QUESTIONNAIRE SURVEYS

H. Yoshida^{*}, H. Vaezi-Nejad^{**}, D. Choiniere^{***} and F. Wang^{*}

^{*} UEE, Graduate School of Engineering, Kyoto University, Japan, ^{**} Centre Scientifique et Technique du Bâtiment, France, ^{***} Natural Resources Canada, Canada

Summary: In this paper the present status and requirements for commissioning of HVAC Systems using Building Energy Management Systems (BEMS) and commissioning the BEMS itself are investigated and summarized. The information presented is based on the results of the questionnaire and interview survey of experts which was carried out in four countries; Japan, the USA, France and Canada. This paper intends to clarify the requirements and future scope of the above issues by analyzing similarities and differences between the countries.

Keywords: commissioning, BEMS, HVAC, questionnaire survey

INTRODUCTION

This paper intends to investigate requirements for commissioning HVAC systems using BEMS and commissioning the BEMS itself based on questionnaire and interview survey of experts in four countries; Japan, the USA, France and Canada. In the present study BEMS is defined as a computerized system with a central work station performing not only energy management but also other functions such as automatic control of HVAC systems and their rational operation, etc. A BEMS would be a powerful system to assist commissioning work, but to make it possible, the BEMS itself must be well commissioned in advance of utilization. The key objective of this paper is to clarify the requirements for commissioning with BEMS in order to identify the types of improvements required for the commissioning process and the tools that should be developed.

SURVEY TO EXPERTS IN JAPAN AND THE USA

As a part of IEA Annex 40, questionnaire was prepared by the Japanese workgroup with the help of Annex 40 international members and translated into English for use in the US. This questionnaire was used to survey Japan and the US experts with experience of commissioning HVAC systems using BEMS and commissioning of the BEMS itself in 2002 and 2003^{1), 2)}.

The number of Japanese respondents was 142 and that of the US was 10. Because there are too few US responses to get statistically meaningful results, the Japanese results are presented primarily and the US results are discussed when significant differences between two countries exist.

• Document Preparation for Commissioning

To perform commissioning documents such as design specifications, factory inspection reports of equipment, etc., are necessary. For each of the projects in which respondents were involved, the availability of each document was scored using four arbitrary levels as follows; existing prior to commissioning = 3, obtained during commissioning = 2, hard to obtain during commissioning = 1, and not provided = 0.

Using the average of all the scores, the availability of documents was evaluated by six arbitrary levels or 'ranks' as follows: rank 1: very good given for the average score between 3.0 and 2.75, rank 2: fairly good (2.75