

Accepted Manuscript

Title: An intermittent heating strategy by predicting warm-up time for office buildings in Beijing

Author: Baoping Xu Shaoxiang Zhou Wenju Hu

PII: S0378-7788(16)31951-X
DOI: <http://dx.doi.org/doi:10.1016/j.enbuild.2017.08.062>
Reference: ENB 7891

To appear in: *ENB*

Received date: 18-12-2016
Revised date: 5-7-2017
Accepted date: 22-8-2017



Please cite this article as: B. Xu, S. Zhou, W. Hu, An intermittent heating strategy by predicting warm-up time for office buildings in Beijing, *Energy and Buildings* (2017), <http://dx.doi.org/10.1016/j.enbuild.2017.08.062>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

An intermittent heating strategy by predicting warm-up time for office buildings in Beijing

Baoping Xu^{1,*}, Shaoxiang Zhou¹, Wenju Hu²

¹ School of Energy Power and Mechanical Engineering, North China Electric Power University, Beijing 102206, China

² Beijing Key Lab of Heating, Gas Supply, Ventilating and Air Conditioning Engineering, Beijing 100044, China

*Corresponding author. E-mail address: xubp@ncepu.edu.cn; Tel: +86 10 61772713

Abstract

In order to achieve building energy efficiency and keep the indoor temperature within a defined comfort range during working hours, a predictive control strategy is proposed for intermittent heating of office buildings by predicting the warm-up time on each working day. A physical model for simulating and forecasting thermal behavior of the building is developed using the state space method. Furthermore, a modeling analysis case is given based on a typical office building in Beijing with different types of building insulation and terminal forms. The increasing capacities of heating equipment, transition time, room temperature variation and energy saving rate are simulated and analyzed. Results indicate that when applying an intermittent heating strategy, the required heating capacity for each room is 1.1-1.3 times to that of a traditional continuous heating system. The warm-up time ranges from several minutes to several hours depending on conditions, while cooling down time is much shorter than warm-up time. In addition, we found that heating systems in ordinary buildings with fan coils as terminal devices have faster temperature responses than those in energy efficient buildings with radiators. It is necessary to consider standby

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات