

APPLICATION OF INTERNATIONAL STANDARDS WITHIN FACILITY MANAGEMENT IN BULGARIA

Ivan Zhelev*

1. Introduction

In today's economy, organizations are forced to look for new ways to streamline processes and reduce the final cost of non-core processes. The facility manager and the facility management department are largely responsible for those procedures. Facility management is related mainly to minimizing costs for the buildings owned by organizations, in order to ensure a more conducive working environment. These processes can be standardized, which will help to increase the effectiveness of the organization's mission.

Research on the application of international standards within facility management has cognitive, theoretical and practical importance, with the major reasons as follows: a) international standards within facility management represent a summary of best business practices that does not depend on the organization and its use of buildings; b) use of international standards and regulations provides a specific methodology, a model for the management of the buildings that the organization has, with a cost-reducing effect; c) international standards in the field of facility management in accordance with 2012/27/ES the new Directive of the European Parliament and of the Council of 25 October 2012 on energy efficiency [1] and the strategy "Europe 2020", provide a comprehensive strategy for smart, sustainable and inclusive growth.

In view of these arguments, in this paper, the author aims to explore and systematize the main groups of international standards within the facility management and outline a practical approach to their application in Bulgaria in order to help organizations reduce the cost of non-core processes.

The research objectives are: to clarify the place of the standard model in the management of buildings and provide a brief description of various types of international standards, suggesting an approach for the practical application of the abovementioned standards.

2. Management model for building and site standards

Based on fundamental theories in facility management and the author's empirical findings, the model for building management can be presented as a basic theoretical formulation for making changes in the management of non-core processes of facility managers (Fig. 1). In Bulgaria, the profession "facility manager" is included in the National Classification of Occupations 2011, code 5006 to a group of 1219, which is for leaders in business services and administrative activities [2].

This model outlines the main elements and applied standards in order to ensure the efficient operation of buildings and non-core processes. Fig. 1 shows that the performance of non-core (supporting) processes within an organization to facility management is essential. Their scope encompasses the following main types of standards: facility management, automation and building management, management projects for green building and energy efficient buildings. This paper suggests that the use of model in building management processes support effective delivery of facility management services, thereby reducing the costs of non-core processes in organizations and ensuring a sustainable working environment.

* © Ivan Zhelev; Assoc. Prof. PhD; University of Economics; Varna; Department of "Economics and Management of Construction"; E-mail: <zheleff@ue-varna.bg>.

Analyzing problems in the application of standards within the facility management requires the clarification of the terms “facility management”, “standard” and “standard in the field of facility management”.

Facility management includes the management of buildings’ life cycle, including the cost of construction (or acquisition), operating costs and expenses for renovation, with the purpose to provide a healthy and safe working environment for human beings [3, p.27].

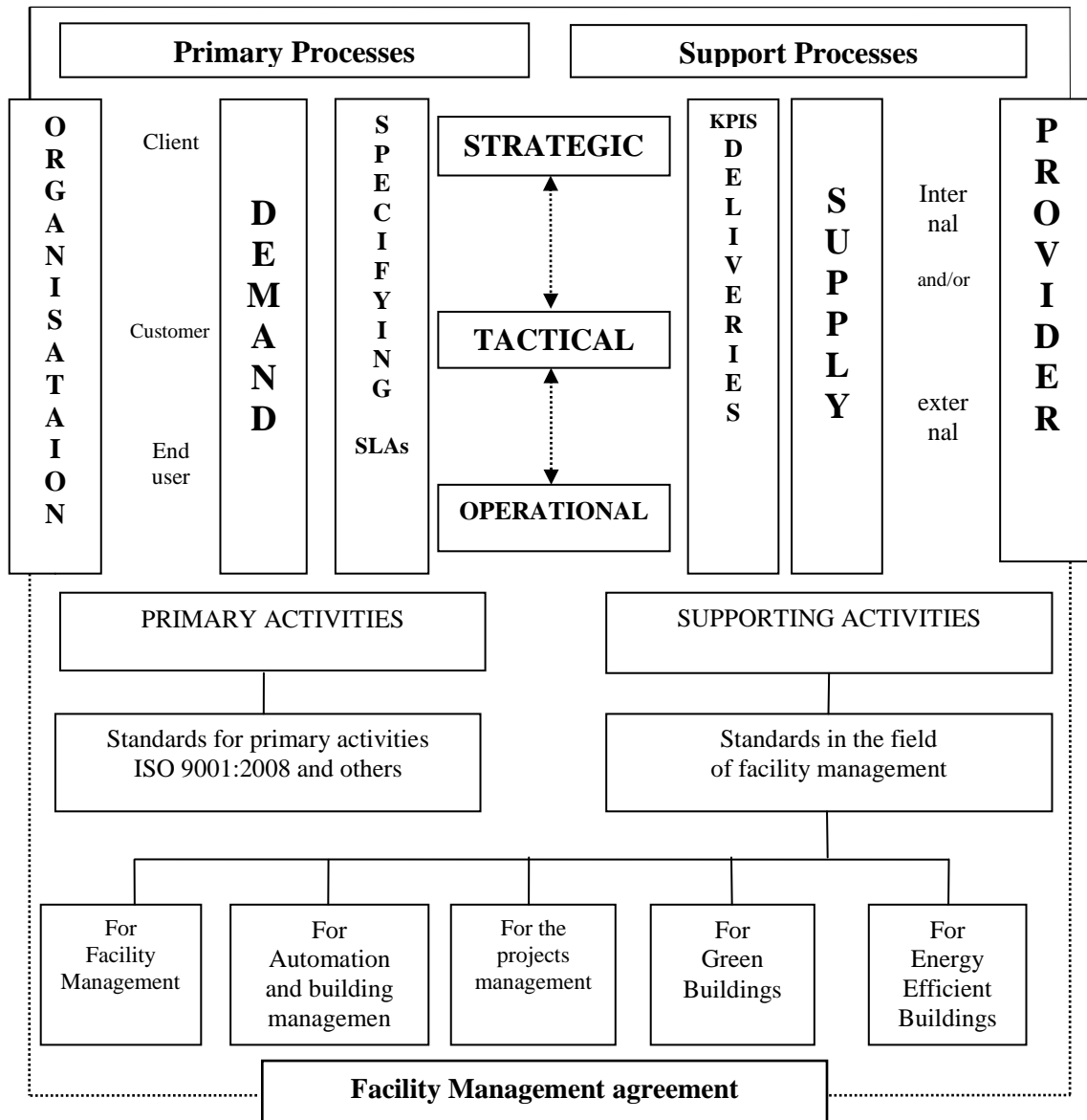


Fig. 1. Model of building management and applied standards in facility management

Source: Appendix A1 of standard EN 15221-1: 2006 and the addition of the author.

Understanding the CEN (Le Comité européen de normalisation) for the term “facility management” is related to the integration of processes within an organization that maintain and develop the agreed services to support and improve the effectiveness of its primary activities [4, p.3]. In this article, the author assumes that facility management should be seen as separate, specific activity of the organizations, an element of the management system, associated with non-core activities, including a package of facility management services. The above said services support the organization's mission focusing on efficient operation of buildings.

According to ISO (International Standard Organization) the term “standard” means “documented agreements containing technical specifications or other precise criteria and clear, designed set of

policies, guidelines, or definitions of different characteristics helping to ensure that materials, products, processes or services fully meet its purpose” [5]. It is to be noted that according to BDS (Bulgarian Institute for Standardization) the term “standard” means “a document, established by agreement and approved by a recognized body that defines a set of common and repeated administration rules, guidelines or characteristics for activities or their outcomes, to help achieve optimal order of the given set of circumstances” [6].

Based on these and other qualifying standards, in the field of facility management “standard” may be identified as a document that has been approved by international and/or regional and nationally recognized institution that provides common understanding of the most important terms and processes in facility management, creates rules based on best business practices adopted by agreement of the professionals, and applies those practices to create a specific model for effective facility management in organizations.

Standards within an organization represent the set of goals providing a level of service with minimal costs for operation, maintenance and improvement of buildings, which contributes to an effective facility management. For various organizations, implementing effective facility management today, becomes a crucial necessity, since first, they are related to maintaining or increasing the value of buildings, and second, they ensure that the non-core processes are conducted at a minimal cost.

On the basis of the abovementioned, the following conclusions can be drawn:

1. Facility management of an organization solves problems related to non-core (supporting) processes and provides a comfortable working environment and opportunities to reduce operating costs, maintenance costs and increase improvements to buildings.
2. Effective facility management in organizations depends on the use of a model for building management, based on best practices that include major groups of relevant standards within facility management.

3. Main groups of applied standards within the facility management

First group of standards for facility management. The first six standards are adopted by the BIS, (Bulgarian abbreviation in brackets). In addition to these standards, this group may be supplemented by the standards for measuring of buildings – BOMA (Building Owners and Managers Association) International [7]. They are, as follows:

1. BDS EN 15221-1:2009. Facility management. Part 1: Terms and definitions. This European standard gives relevant terms and definitions in the area of Facility Management. It also provides insight into the scope of Facility Management.
2. BDS EN 15221-2:2009. Facility management. Part 2: Guidance on how to prepare Facility Management agreements. This European standard provides guidance on the preparation of agreements for Facility Management work. Applied to: Facility Management agreements for both public and private European Union cross-border, as well as domestic, client/Facility Management service provider relationships; full range of facility services; both types of Facility Management service providers (internal and external); all types of working environments (e.g. industrial, commercial, administrative, military, health etc.).
3. BDS EN 15221-3:2012. Facility management. Part 3: Guidance on quality in Facility Management. This is a European standard that provides guidance on measuring and achieving quality improvement in Facility Management. The standard provides basic management procedures and management theory.
4. BDS EN 15221-4:2012. Facility management. Part 4: Taxonomy, Classification and Structures in Facility Management. This standard therefore introduces the concept of standardised

(classified) facility products. The aim of this standard is to provide taxonomy for Facility Management which includes: relevant interrelationship of elements and their structures in Facility Management; definitions of terms and contents to standardised facility products which provide a basis for cross border trade, data management, cost allocation and benchmarking; a high level of classification and hierarchical coding structure for the standardised facility products; expanding the basic FM model given in EN 15221-1 by adding a time scale in the form of the quality cycle called PDCA (Plan, Do, Check, Act).

5. BDS EN 15221-5:2012. Facility management. Part 5: Guidance on Facility Management processes. This European standard provides guidance to Facility Management organisations on the development and improvement of their processes to support the primary processes. This standard also sets out basic principles, describes high-level generic Facility Management processes, lists strategic, tactical and operational processes and provides examples of process workflows. This standard is based on a primary processes, demand perspective for an audience of all stakeholders in Facility Management process.
6. BDS EN 15221-6:2012. Facility management. Part 6: Area and Space Measurement in Facility Management. This European Standard establishes a common basis for planning and design, area and space management, financial assessment, as well as a tool for benchmarking in the field of Facility Management. This standard covers area and space measurement for existing owned or leased buildings as well as buildings in state of planning or development. This standard presents a framework for measuring floor areas within buildings and areas outside of buildings.
7. EN 15221-7:2012. Facility management. Part 7: Guidelines for Benchmarking. This European Standard gives guidelines for benchmarking and contains clear terms and definitions as well as methods for benchmarking facility management products and services as well as facility management organisations and operations. This European Standard establishes a common basis for benchmarking of facility management costs, floor areas and environmental impacts as well as service quality, satisfaction and productivity.

Second set of standards – for automation and building management. This group includes:

1. BDS EN 14908-1:2006. Open Data Communication in Building Automation, Controls and Building Management – Control Network Protocol – Part 1: Protocol Stack. This specification is applied to a communication protocol for control systems network. The protocol provides peer-to-peer communication for control network and is suitable for implementing both peer-to-peer and master-slave control strategies.
2. BDS EN 14908-2:2006. Open Data Communication in Building Automation, Controls and Building Management – Control Network Protocol – Part 2: Twisted Pair Communication. This European Standard specifies the control network protocol (CNP) free-topology twisted-pair channel and serves as a companion European Standard to prEN14908-1. The channel supports communication at 78.125 kbps between multiple nodes, each of which consists of a transceiver, a protocol processor, an application processor, a power supply, and application electronics.
3. BDS EN 14908-3:2007. Open Data Communication in Building Automation, Controls and Building Management – Control Network Protocol – Part 3: Power Line Channel Specification. This European Standard specifies all the information necessary to facilitate the exchange of data and control information over the power line medium. This European Standard establishes a minimal set of rules for compliance. It does not control extended services to be provided, but the rules are adhered to within the system. It is the intention of the standard to permit extended services (defined by users) to coexist.

4. BDS EN 14908-4:2007. Open Data Communication in Building Automation, Controls and Building Management – Control Network Protocol – Part 4: IP Communication. This European Standard specifies the transporting of Control Network Protocol (CNP) packets over Internet Protocol (IP) networks using a tunnelling mechanism wherein the CNP packets are encapsulated within the IP packets. It is applied to both CNP nodes and CNP routers. The purpose of this European Standard is to insure interaction between various CNP devices that wish to use IP networks to communicate using the CNP protocol. The main body of this European Standard is independent of the CNP protocol being transported over the IP network.
5. BDS EN 14908-5:2010. Open Data Communication in Building Automation, Controls and Building Management Implementation Guideline – Control Network Protocol – Part 5: Implementation. This specification contains all the information necessary to facilitate the exchange of data and control information in an interactive manner using EN 14908-1 and its associated data-transport media specifications. This specification establishes a minimal set of rules for compliance.
6. BDS EN 14908-6:2011. Open Data Communication in Building Automation, Controls and Building Management – Control Network Protocol – Part 6: Application elements. This European Standard provides mechanisms through which various vendors of building automation, control, and building management systems may exchange information in a standardised way. This document provides specifications for the Application Elements of Control Network Protocol packets as follows: definitions of standardized packet (network-variable) data types; definitions of device-interface files; definitions of standardized configuration-property types; definitions of standardized enumeration types; definitions of standardized functional profiles; definition of the standardized method of file transfer between devices.

The third group standards – Project Management. They are:

1. ISO 21500:2012. Guidance on project management. This standard provides guidance for project management and can be used by any type of organization, including public, private or community organizations, and for any type of project, irrespective of complexity, size or duration. ISO 21500:2012 provides high-level description of concepts and processes that are considered to form good practice in project management [5].
2. The PMBOK ® Guide – Fourth Edition (The Guide to Project Management Body Of Knowledge – Knowledge Management, Project Management) is a standard PMI (Project Management Institute – Institute of Project Management), which includes a set of knowledge of management projects relating to specific areas: the construction industry and the government sector as well as other standards [8].
3. The IPMA (International Project Management Association) Competence Baseline, ICB ® version 3.0 – is an international standard for certification of competence in project management to individuals – project managers, consultants – management of projects, programs and portfolios of projects, organizations – organizational competence in project management at various levels of competence [9].
4. PRINCE 2 (Projects IN Controlled Environment) is a British standard, which was established in 1989. It appeared as a control of the British government projects in the field of information and telecommunications technologies [10].

The fourth group of standards – for green buildings. In Bulgaria, based on standards of BREEAM, LEED and DGNB for certified green buildings, the following are applied:

1. BREEAM (Building Research Establishment Environmental Assessment Method) is the first certification system for green buildings established in the UK in 1990, which is the basis for

many worldwide systems. It is a standard method for assessing green buildings – as of right now over 200,000 buildings worldwide have been certified under BREEAM [11].

2. LEED (Leadership in Energy and Environmental Design) – the Energy and Environmental Design Manual is an internationally recognized green building regulation recognized by the U.S. since 1998. It aims to reduce the impact of the life cycle of buildings on the environment. This is the most common certification system for green buildings in the world, used in the U.S., Canada, India, China and other countries [12].
3. DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen) – a German standard for sustainable buildings established in 2009. The most modern and most comprehensive accounting principles for stability and specificity of different buildings [13].
4. CASBEE (Comprehensive Assessment for Building Environmental Efficiency) – a standard system for evaluating the performance of buildings' environment, established in Japan in 2005 [14].
5. Greenstar – a comprehensive rating system that evaluates the design, building construction and the constructed environment. It was established on the basis of BREEAM in Australia in 2003 [15].
6. HQE (Haute qualite environnementale) – A system of certifications for new and existing buildings, showing the effects on the environment. Created in France in 2005 [16].

The fifth group of standards – for energy efficient buildings. The main are:

1. ISO 21930:2007 Sustainability in construction. Environmental declaration of building products. This standard provides principles and requirements for Type III environmental declarations (EPD) for the building and the utilized products. Contains specifications and requirements for the EPD of construction products [5].
2. ISO 21931-1:2010. Sustainability in construction. Framework for methods of assessment of the environmental performance of construction works – Part 1: Buildings. Provides a common framework for improving the quality and comparability of methods for assessing the environmental performance of buildings and associated external works [5].
3. PHS (Passive House Standard) – the world's leading standard for energy efficient buildings, helping to reduce environmental impacts such as the amount of energy consumption (which must be below 15 KW/m²). PHS is demonstrated by PHI (Passive House Institute) for the first time in 1988 as a passive method for design and evaluation of buildings using the software PHPP (Passive House Planning Package) [17].
4. Energy Star – standard created in 1992 by the EPA (Environmental Protection Agency). Used to reduce energy consumption of consumer products. Different types of buildings can be evaluated with this standard for determining the energy efficiency [18].

4. Practical application of standards organizations

Practical application of international standards would improve the efficiency of facility management and non-core processes in organizations. It is appropriate to implement the model (cycle) known as PDCA / SDCA (Plan, Do, Sheck, Act / Standart, Do, Sheck, Act – an oriented process has been improved over many decades (now standard ISO 9001 is also included), ensuring the stability of the thinking and formulating oriented processes [19, 54].

To apply these standards in an organization, a very important condition is the organizations' awareness and support of management. To apply international standards in the field of facility management it is necessary to have an innovative and active management.

The process of implementation the standards can be achieved in the following sequence:

First step – planning the implementation of international standards. The facility manager needs to develop a plan including the following elements: policy, facility management, scope (package) of facility management services objectives and outcomes to be achieved by facility management. The plan outlines the use of appropriate tools (company standards for individual services, other documents) for maintenance processes, audits to improve facility management, the roles and responsibilities of directors, facility management department, facility managers and other employees; interaction processes and key business procedures; mechanisms for monitoring the plan, audit contractors, budget and resources needed to achieve the goals, specific plans for a process, such as maintenance of buildings, utilities, security, cleaning, etc. All must be in accordance with the plan for the implementation of international standards.

Second step – implementation of the plan. The organization is required to undertake the following activities: distribution and control of the roles and responsibilities of full-time staff or external contractors / consultants (in the form of outsourcing), documenting the plan and procedures for determining definitions for each process or group of processes in facility management; risk management, choosing management teams, executing training of existing or new staff, maintenance and operation, management of resources and budget; preparation of periodic reports on the process of introducing the standards and implementation of the plan, coordinating the processes of implementation.

Third step – verifying the implementation of the plan. Encompassing the monitoring, measurement and review of the plan and its comparison with the actual implemented activities. The plan must have provisions for auditing, taking into account the status and importance of the processes and sectors to be monitored and tested, and the results of previous audits.

At planned intervals, management or a representative must conduct a review to determine whether the processes are correctly executed, e.g. corresponding to the plan to implement international standards, effectively implemented and maintained, determining variations that could dictate the correct action.

Fourth step – actions to continually improve the effectiveness of the provided facility management services. For this purpose, the plan for compliance must be a declared policy and the company standard of service should show the requirements for the facility management service.

Failure to comply with adopted or internal company standards should demand the appropriate adjustments. All proposed improvements to facility management processes need to be assessed, recorded, ranked by priority, approved and consequently included in an existing or new standard plan for increasing the efficiency of the building management model.

5. Conclusions

Based on the abovementioned, it is appropriate to identify several key conclusions and recommendations:

1. Facility management in an organization solves problems related to non-core (supporting) processes to reduce the cost of operation, maintenance and improvements of buildings and provides a comfortable working environment.
2. Effective facility management in organizations is achieved through a model of building management, including best business practices in the form of the applicable standards within the facility management, such as: facility management automation and building management, management projects, green buildings, energy efficient buildings.
3. The organization's management should study and apply international standards in the field of facility management in order to achieve greater efficiency of processes without additional expenses.

4. Appropriate model for the application of international standards is PDCA/SDCA, which is aimed to improve the processes for facility management services in an organization.

The issues on the application of international standards within the facility management can be improved at an early stage. Creative application of standards of management of organizations is a possible way for effective facility management and cost reduction of non-core processes.

References

1. Official Journal of the European Union law “EUR-Lex” [Electronic source]. – Access: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:315:0001:0056:BG:PDF>.
2. Министерство на труда и социалната политика Република България [Electronic source]. – Access: <http://www.mlsp.government.bg/bg/index.asp>
3. Cootts, David G. The Facility Management Handbook / David G. Cootts. – AMACOM, New York, 2009.
4. Standard EN 15 221-1:2006.
5. The International Organization for Standardization (ISO) [Electronic source]. – Access: <http://www.iso.org>.
6. Bulgarian institute for standardization [Electronic source]. – Access: http://www.bds-bg.org/pages/?button_id=20.
7. BOMA International [Electronic source]. – Access: <http://www.boma.org>.
8. Project Management Institute (PMI) [Electronic source]. – Access: <http://www.pmi.org/PMBOK-Guide-and-Standards.aspx>.
9. International Project Management Association (IPMA) [Electronic source]. – Access: <http://ipma.ch>.
10. Projects in Controlled Environments (PRINCE 2) [Electronic source]. – Access: <http://www.prince2.com>.
11. The world’s foremost environmental assessment method and rating system for buildings BREEAM [Electronic source]. – Access: <http://www.breeam.org>.
12. Leadership in Energy and Environmental Design (LEED) [Electronic source]. – Access: <http://www.leed.net>.
13. German Sustainable Building Council (DGNB) [Electronic source]. – Access: <http://www.dgnb.de>.
14. Institute for Building Environment and Energy Conservation [Electronic source]. – Access: <http://www.ibec.or.jp/CASBEE/english/index.htm>.
15. Green Building Council of Australia [Electronic source]. – Access: <http://www.gbca.org.au>.
16. L’Association HQE [Electronic source]. – Access: <http://assohqe.org>.
17. The Passive House Institute (PHI) [Electronic source]. – Access: <http://www.passiv.de>.
18. Environmental Protection Agency (EPA) “ENERGY STAR” [Electronic source]. – Access: http://www.energystar.gov/index.cfm?c=about.ab_index.
19. Fileva P. Total quality management and new business philosophy / P. Fileva, Hr. Tujarov. – Sofia: Asenevtsi, 2007.

Summary

In today’s economy, organizations are forced to look for new ways to streamline processes and reduce the final cost of non-core processes through effective facility management. The article summarizes the major groups of international standards within the field of facility management and their application in Bulgaria. A model for building management is proposed; together with a brief description of the different groups and types of international standards and a proposed approach to apply the standards-based model PDCA/SDCA.

Keywords: facility management, model building management, international standards.

UDK classification: 332.1:658.2.005.93

Date of acceptance 23.09.2013