

## CORRELATING THE CONTENT AND CONTEXT OF PAS 55 WITH THE ISO 55000 SERIES

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### ABSTRACT

The ISO 55000 series is soon to supersede PAS 55 as the most recognised international standard for asset management. A correlation of the content and context of PAS 55 with the ISO 55000 series is required to assist organisations with the transition. After analysis of the structures, similarities, differences, and omissions of the two standards, a map was created to correlate the summarised content and context. The map established that, although both sets of standards have a similar structural framework, the ISO 55000 series is a more comprehensive and detailed standard, creating a clearer way to implement an asset management system within an organisation.

### OPSOMMING

Die ISO 55000 reeks gaan binnekort PAS 55 as die mees erkende internasionale standaard vir batebestuur vervang. 'n Korrelasie van die inhoud en konteks van PAS 55 met dié van die ISO 55000 reeks word vereis om organisasies te help met die oorgang vanaf die PAS 55 na die ISO 55000 raamwerk. Na 'n analise van die strukture, ooreenkomste, verskille, en weglatings van die twee standaarde is 'n kaart geskep om die saamgevatte inhoud en konteks te korreleer. Die kaart bevestig dat, alhoewel beide stelle standaarde 'n soortgelyke strukturele raamwerk het, die ISO 55000 reeks 'n meer omvattende en gedetailleerde standaard en 'n duideliker weg tot die implementering van 'n batebestuurstelsel binne 'n organisasie bied.

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## 1. INTRODUCTION

PAS 55 is a specification for optimally managing physical assets. This publicly available specification (PAS) was first published in 2004 in response to a demand from industry for a standard for asset management. It was revised in 2008 in the light of increasing international consensus about required good practices in the management of physical assets [1]. PAS 55 was prepared and published by the British Standards Institution (BSI), although it is not regarded as a British standard. Since PAS 55 was created, it has proven to be a complete success, although lacking detail [2].

The International Organization for Standardization (ISO) is using PAS 55 as the basis for creating the first-ever international standard for asset management, known as the ISO 55000 family of standards [4]. Thus there is much anticipation that the ISO 55000 series will surpass the success of its predecessor (PAS 55) [3]. The ISO standard for asset management consists of three different segments: ISO 55000, ISO 55001, and ISO 55002. All three standards are referred to as the ISO 5500X suite of standards. ISO 55000 consists of an overview, principles, and terminology; ISO 55001 makes up the requirements of the asset management system; and ISO 55002 deals with guidelines for the application of ISO 55001.

ISO 5500X keeps the core ideas of PAS 55 with some additions and omissions of sections to make the standard more applicable and user-friendly. The ISO 5500X family of standards is aligned with other major management systems specifications, making integration of the systems easier. These other management systems include ISO 9001 for quality management, ISO 14001 for environmental management, OHSAS 18000 for occupational health and safety, and ISO 31000 for risk management [4].

It is expected that in early 2014 [4] the ISO 5500X standard will take effect and become the official standard for organisations to follow in the management of their physical assets. PAS 55 will then cease to exist.

Although there is a mapping of the details between PAS 55, OHSAS 18001, ISO 14001, and ISO 9001 [1], a mapping between PAS 55 and the ISO 5500X suite was not found in the literature. This article is an attempt to map the content and context of PAS 55 to ISO 5500X, both to assist with the transition between the standards, and to identify the sections that are omitted from PAS 55 and the new sections created in ISO 5500X. To get the most out of this article, we recommend that the reader has copies of both PAS 55 and the ISO 5500X suite handy while reading this article; both are readily available on the internet.

## 2. OVERVIEW OF PAS 55

The 40-page PAS 55 document was summarised into one page, and is presented in a flow diagram format in Figure 1. This summarised flow diagram omits much of the detail, leaving the reader with a simple and concise picture of PAS 55. Below is a description of what is seen in Figure 1.

The Deming cycle, plan-do-check-act (PDCA), originally created for quality control, was proposed by Dr W. Edwards Deming in 1950 [5]. The PDCA framework ensures quality in the physical asset management (PAM) environment. PAS 55 is based on the PDCA framework, with a primary focus on the management of physical assets and asset systems. PAS 55 has three key elements: it places the responsibility for asset management firmly in the hands of executive management; it is broad in reach, driving a cross-functional approach; and it addresses the key issues of risk, whole-life costing, and knowledge management, together with sustainability and accountability [6].

Asset management policy (4.2), strategy (4.3.1), objectives (4.3.2), and plans (4.3.3), as well as contingency plans (4.3.4), all fall under the 'plan' phase of the PDCA framework.

Asset management strategy, objectives, and plans need to be established so that they deliver results in accordance with the organisation's asset management policy and strategic plan [1].

Asset management enablers and controls (4.4) and the implementation of asset management plans (4.5) fall under the 'do' phase of the PDCA framework. In this phase the organisation must establish the enablers for implementing asset management and other necessary requirements, and implement the asset management plans [1].

Performance evaluation and improvement (4.6) fall under the 'check' phase in the PDCA framework. The organisation should monitor and measure results against the asset management policy, strategy, objectives, and legal and other requirements. Thereafter the organisation must record and report the results [1].

Management review (4.7) falls under the 'act' phase in the PDCA framework. The organisation needs to act to ensure that the asset management objectives are achieved and continually to improve the asset management system and asset management performance [1].

### 3. OVERVIEW OF ISO 5500X

The most important information from the 91 pages of the ISO 5500X suite has been extracted and condensed into one page in the form of a flow diagram, seen in Figure 2. This summarised flow diagram leaves out the detail, leaving the reader with a simplified picture of the ISO 5500X suite. Below is a description of what is seen in Figure 2.

The ISO 5500X suite is currently in its final stages of preparation, with a second committee draft for this set of standards having been issued. The technical committee 251 of ISO is currently in the process of editing and voting on this standard [7], which is proposed for release in February 2014 [8]. These standards are intended for the use of those who establish, implement, maintain, and improve asset management systems [9].

ISO 55000 is an overview of what an asset management system consists of and of the terminology that is used throughout the ISO 5500X suite of standards. The basic principles of asset management are mentioned, and the benefits that such a system offers the different management levels of an organisation are briefly outlined.

ISO 55001 specifies the minimum requirements to establish, implement, maintain, and improve an asset management system. These requirements are to enable parties, internal and external, to be able to measure an organisation's ability to meet legal, regulatory, and contractual requirements as well as the organisation's own requirements.

The last standard of the suite, ISO 55002, offers guidance on how to apply an asset management system in accordance with the requirements of ISO 55001. The standard informs the reader of how to implement and maintain an asset management system at all management levels of an organisation by providing guidance of what should be done. It also gives insight into the planning, operation, and support activities that go with such a system.

The entire ISO 5500X suite of standards is based on the general PDCA framework. ISO 55000 is not divided into the same subsections as ISO 55001 and ISO 55002, because it only explains the concepts and terminology of asset management systems. ISO 55001 and ISO 55002 are divided into seven main elements: (1) organisational context, (2) leadership, (3) planning, (4) support, (5) operation, (6) performance evaluation, and (7) improvement [10]. These sections can be grouped to fit into the PDCA framework. The basic overview of each of the seven elements can be found in Clause 2.5.3 of ISO 55000 [9].

Thus ISO 5500X is a guide that tells readers what to do; but it does not tell them how to do it. The activities that should be done are specifically mentioned, but the end user can

decide how to implement the suggestions that are offered. To utilise the benefits of asset management fully, the strategy for implementation should be integrated with the greater business plan and other management systems of the organisation [4].

#### 4. CORRELATION OF PAS 55 WITH ISO 5500X

A problem that will be encountered in the near future will be how to convert an organisation from the PAS 55 structural framework to the ISO 5500X structural framework. Since this is relatively new, an attempt is made here to map the content and context of PAS 55 to each of the ISO 5500X standards. This mapping, in table form, offers a guideline that shows which sections of the documents are linked or related. This is shown in Table 1.

Despite the differences between PAS and ISO, all the content in both sets of standards can be divided into the seven categories mentioned earlier: context of the organisation, leadership, planning, support, operation, performance evaluation, and improvement [10]. Dividing the PAS and ISO standards into these seven categories, as seen in Figure 1 and Figure 2, simplifies the mapping process between PAS and ISO. The PAS and ISO documents both contain an introduction, and sections for scope, normative references, and terms and definitions. For Table 1 these were grouped into the category 'introduction & miscellaneous'. The 'leadership' and 'planning' are grouped together, since a lot of content from the two sections falls within the same sections. 'Support' and 'operation' are also grouped together, so that the categories within Table 1 are neatly displayed. Thus the standards are divided into five main categories: introduction and miscellaneous, leadership & planning, support & operation, performance evaluation, and improvement, all of which can be seen in Table 1.

It can be seen from Table 1 that PAS 55 is a very brief document that addresses certain topics in its introduction. On the other hand, ISO 5500X will have an entire chapter devoted to these selected topics. ISO 55000 only offers an overview of what asset management is and of the terms that are used within the asset management environment. It is thus linked to almost all of the PAS 55 sections, explaining the terms and informing the reader where to search for the requirements in ISO 55001. The ISO suite of standards goes into more detail and depth compared with PAS 55, resulting in a much longer and more conclusive document. PAS 55 names activities to be done, but does not always state the minimum criteria to be met in order to achieve the activities' outcomes; whereas ISO 55001 offers the minimum criteria for the activities suggested, and ISO 55002 provides interpretation and implementation guidance for the system's activities. Note that for many of the PAS 55 subsections, ISO 5500X has an entire section that corresponds to it.

##### 4.1 Risk within the PDCA cycle

In physical asset management, risk assessment and management is a topic of great importance. Within the PAS and ISO frameworks, risk is dealt with in the 'planning' phase, as well as in the 'doing' phase. However, risk is an underlying factor throughout the entire PDCA cycle of both PAS and ISO. Within the PAS framework, asset management related risks are taken into account in the 'planning' phase when deriving the organisation's objectives; and in the 'doing' phase, the organisation needs to identify and assess the asset related risks, as well as identify and implement necessary control measures throughout the life cycle of the assets. Within the ISO framework, all risks are addressed in the 'planning' phase, considering the internal and external issues. In the 'doing' phase, a criterion for controlling and implementing the control processes of the identified risks is completed.

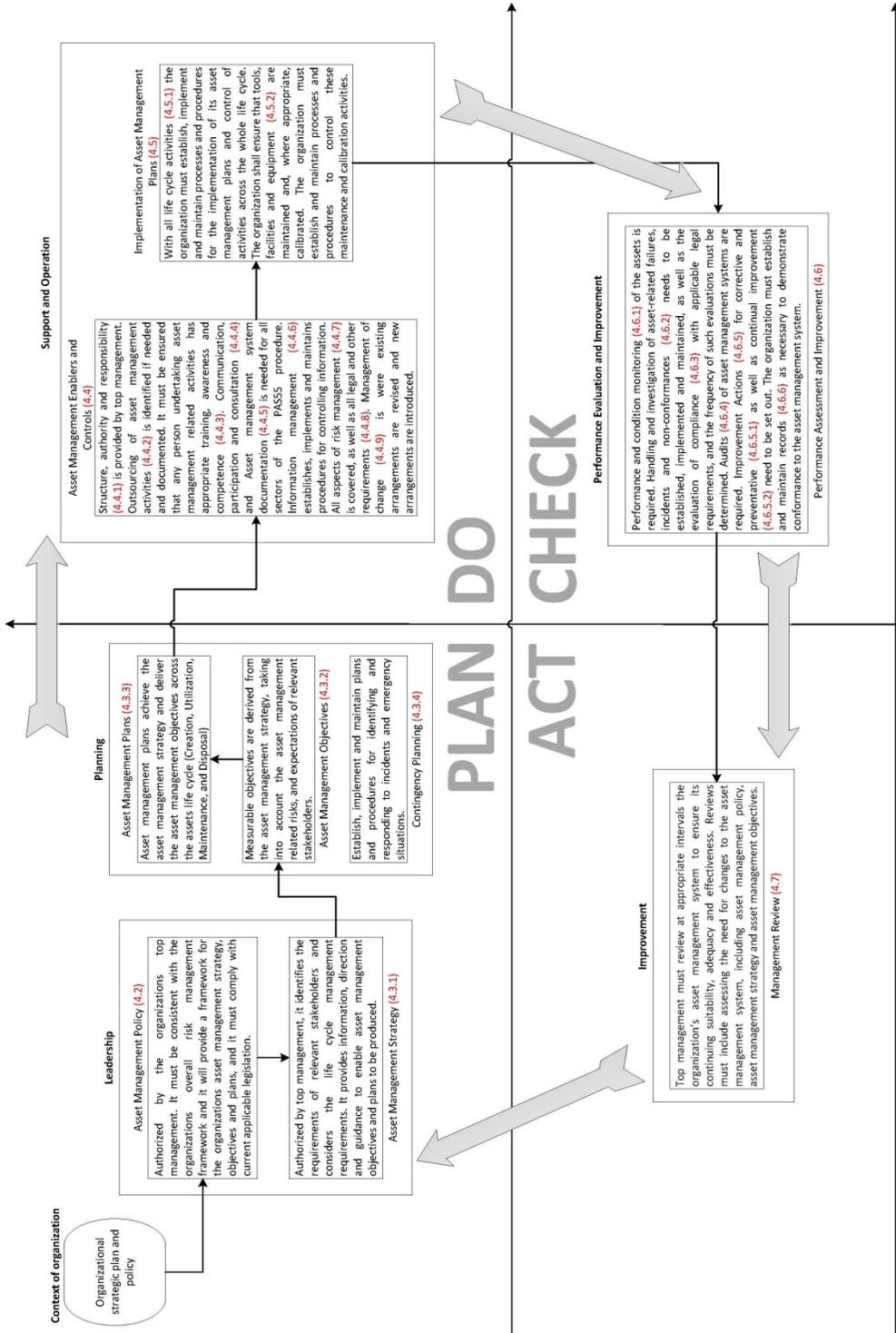


Figure 1: PAS 55 summarised in one page

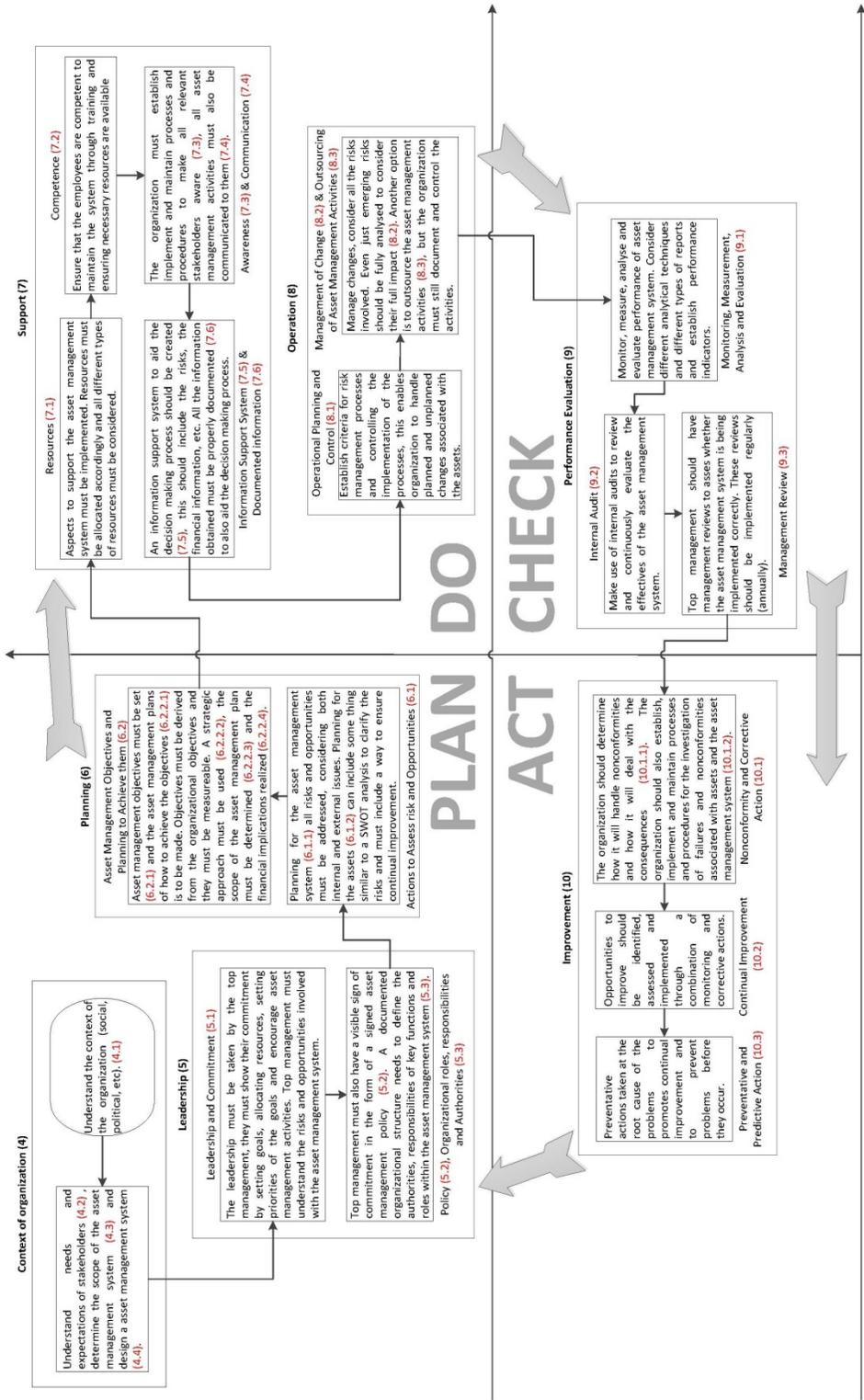


Figure 2: ISO 5500X summarised in one page

Table 1: Mapping of PAS 55 to ISO 5500X

Category	PAS 55 Clause	ISO 55000 (Clause)	ISO 55001 (Clause)	ISO 55002 (Clause)
Introduction & miscellaneous	0	0	0	0
	0.1	0.3	-	-
		0.4		
		2.1		
		2.2		
		2.4.1		
	0.2	2.3.2	4.3	4.3
	0.3	0.4	4.4	4.4
		2.4.4.1		
		2.4.4.3		
		2.5		
	0.4	0.4	5	5
		2.5.1	6	6
		2.5.3		
		2.5.6		
	0.5	0.2	5.3	5.3
		2.4.5	8	8
0.6	2.4.4	4	4	
	2.5	9.3	9.3	
1	1	1	1	
2	-	2	2	
3	3	3	3	
Leadership & planning	4			
	4.1	-	4	4
	4.2	2.4.3	5.2	5.2
	4.3			
	4.3.1	2.4.4.2	5.1	5.1
		2.5.2		6.2.2.2
	4.3.2	2.4.4.1	6.2.1	6.2.1
	4.3.3	2.4.4.3	6.2.2	6.2.2
	4.3.4	2.4.5.2	8.2	8.2
Support and operation	4.4			
	4.4.1	2.5.2.2	5.3	5.3
		2.5.4		
	4.4.2	2.4.5.3	8.3	8.3
	4.4.3	2.5.2.3.2	7.2	7.2
			7.3	7.3
4.4.4	2.4.2	7.4	7.4	
	2.5.2.3.2			

Table 1(continued): Mapping of PAS 55 to ISO 5500X

Category	PAS 55 Clause	ISO 55000 (Clause)	ISO 55001 (Clause)	ISO 55002 (Clause)
Support and operation (continued)	4.4.5	2.5.2.3.4	7.6	7.6
	4.4.6	2.5.2.3.4	7.5	7.5
			7.6	7.6
	4.4.7	2.5.3.3	6.1	6.1
	4.4.8	2.1	6.1	6.1
		2.2	9	9
	4.4.9	2.4.5.2	8.2	8.2
	4.5			
	4.5.1	2.4.5.1	6.2	6.2
			8	8
4.5.2	-	6.2	6.2	
		7.1	7.1	
		10.3	10.3	
Performance evaluation	4.6			
	4.6.1	2.5.2.4	9.1	9.1
	4.6.2	2.5.2.4	9.1	9.1
	4.6.3	2.5.2.4	9.1	9.1
	4.6.4	2.5.2.4	9.2	9.2
	4.6.5			
	4.6.5.1	2.5.2.4	10.1	10.1
			10.3	10.3
	4.6.5.2	2.5.2.4	10.2	10.2
4.6.6	2.5.2.3.4	10.1	10.1	
Improvement	4.7	2.5.2.4	9.3	9.3

#### 4.2 Additions, omissions, and emphasis

ISO 5500X emphasises that the reader must be able to establish the context of the organisation for the asset management system, and informs the reader about what can be done in order to determine that context. PAS 55 only informs the reader that he/she must understand the context of the organisation, and that risks must be fully established. ISO 55002, on the other hand, offers methods (in Clause 6.1) to implement and determine the risks involved. Improvement actions are discussed in both PAS 55 (Clause 4.6.5) and ISO 55002 (Clause 10). And whereas ISO 55002 suggests that predictive actions are to be used together with corrective, preventative, and continual improvement actions, PAS 55 only suggests the corrective, preventative, and continual improvement actions.

PAS 55 omits how to determine the scope of an asset management system and how to document the scope of the asset management system, whereas ISO 55002 explains both in detail. ISO 55002 includes more detail on effective information management of an asset management system, even detailing principles of effective information management and how to control the documented information. Both ISO and PAS suggest that proactive monitoring is to be used in certain instances; however, only ISO 55002 includes examples of when it would be applicable. PAS 55 lacks detail here, and only informs the reader that these activities must be done, but not when or how to execute them.

A crucial element in an asset management system is the performance evaluation of existing systems used. Internal audits are used to evaluate the performance in order to achieve this. PAS 55 offers the reader guidance about what the audit must achieve, but the reader may still not know how to conduct the audit. ISO 55002 refers the reader to ISO 19011 for the principles and methods of an auditing system, to ensure that the audit is done according to a recognised standard.

Procedures for corrective and continual improvement actions are also found in the ISO 5500X suite of standards, but not in the PAS 55 document. PAS 55 simply informs the reader of the different improvement actions and what they must achieve.

## 5. CONCLUSION

Problems with the interpretation of the ISO 5500X suite are anticipated during the transition from PAS 55 to the ISO 5500X suite. An analysis has been done here of the structures, similarities, differences, and omissions between PAS 55 and the ISO 5500X suite. Table 1 summarises the findings of this analysis. The map in Table 1 will, we hope, add value to asset management practitioners in their journey from PAS 55 to ISO 5500X. By highlighting the differences, and by mapping between PAS 55 and the ISO 5500X suite of standards, we conclude that PAS 55 and ISO 5500X are very similar in overall content. However, the ISO 5500X suite of standards offers a much more detailed and complete document, reducing the possibility of the misinterpretation of any objectives that are open to any organisation.

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