

Developing Asset Life Cycle Management capabilities through the implementation of Asset Life Cycle Plans – an Action Research project

*R.J. Ruitenburg MSc (r.j.ruitenburg@utwente.nl)
Chair of Maintenance Engineering – University of Twente, the Netherlands*

*dr. A.J.J. Braaksma
Chair of Maintenance Engineering – University of Twente, the Netherlands*

Abstract

Asset Life Cycle Management is a strategic approach to managing physical assets over their complete life cycle. However, the literature and the recent ISO 55,000 standard do not offer guidance as to how to develop such an approach. This paper investigates the main capabilities for Asset Life Cycle Management by means of a four year Action Research project implementing Asset Life Cycle Plans. Five main capabilities emerged: 1. strategic information use; 2. alignment of operations and strategy; 3. alignment of different disciplines; 4. a dual time perspective and 5. exerting influence over the assets throughout the entirety of the organization.

Keywords: Asset Management, Asset Life Cycle Management, Action Research

Introduction

The management of physical assets is a crucial activity in industry, as well as in society at large. Production lines, machinery, chemical plants, but also highways, the electricity grid and trains and planes depend on effective maintenance. This importance has been acknowledged by practitioners and scientists alike, resulting in a development from maintenance as a ‘necessary evil’ to a strategic ‘cooperative partnership’ (Pintelon and Parodi-Herz, 2008). This change is also reflected in the new concept of Asset Management, recently described in the first ISO standard on Asset Management: ISO 55,000 (ISO, 2014).

According to this standard, Asset Management “involves the balancing of costs, opportunities and risks against the desired performance of assets, to achieve the organizational objectives” (ISO, 2014, p. 2). As many assets have lifetimes of several decades, the ISO stresses the importance of a ‘life cycle management’ approach.

The importance of such a life cycle approach is further aggravated by two recent developments relevant to Asset Management: the ageing of assets and an increasing level of change in the goals and context of the assets. Recent studies indicated that a large part of the infrastructure and industrial assets in Western-Europe are currently approaching their expected end-of-life (Haarman and Delahay, 2015; Tinga, 2013). Secondly, the literature

indicates that asset managers face an increasing amount of change, ranging from new operations management strategies, ever stricter societal expectations, increasing global competition and increasing environmental awareness (Al-Turki, 2011; Tsang, 2002).

Even though the importance of a true life cycle approach to asset management is paramount, little guidance is offered as to how to develop such an approach in both the literature and standards such as ISO 55.000 (Jooste and Vlok, 2015). Therefore, this paper aims to investigate how a life cycle approach in Asset Management can be established: Asset Life Cycle Management (ALCM). Therefore, the main research question guiding this paper will be: ‘what are the main capabilities for Asset Life Cycle Management and how can an asset management organization develop these ALCM capabilities?’

To answer this question, first the literature on Asset Management capabilities and the characteristics of ALCM will be discussed. The change process from Asset Management to ALCM has been studied using an Action Research project of four years. To bring this change about, the first author was involved in the development of Asset Life Cycle Plans (ALCPs) within an Asset Management organization. Five important ALCM capabilities emerge from this change process: 1. strategic use of information; 2. vertical alignment between higher management and operations; 3. horizontal alignment between different disciplines; 4. a mutual focus on short term operational issues and long term strategic topics; and 5. exerting influence. This paper will conclude that these five capabilities are crucial to make the most of the information and expertise available within the company in order to create maximum value from the exploitation of the assets for the organization.

Theoretical background

In their discussion of the evolution of maintenance since WWII, Pintelon and Parodi-Herz (2008) note that: “[o]ver the last decennia industrial maintenance has evolved from a non-issue into a strategic concern. Perhaps there are few other management disciplines that underwent so many changes over the last half-century” (p. 21). In this section, a closer look will be paid to this profound change and the change in capabilities deemed important.

At first, maintenance was regarded as a ‘necessary evil’, as equipment that broke down had to be fixed before production could be started again. Making the repairs (corrective maintenance) was mainly considered a side-task of the production department.

However, over time the machinery became increasingly complex and more critical for production, as well as for safety. Therefore, maintenance developed into a separate technical support function, which set out to optimize maintenance by doing more preventive (scheduled) maintenance. Due to global competition, the goal of maintenance became to “optimize plant availability at minimum cost” (Moubray, 1996, p. 3).

New approaches to maintenance widened the scope of maintenance to quality (e.g. Total Productive Maintenance (Chan et al., 2005), risks (e.g. Reliability Centred Maintenance (Moubray, 1997)) as well as customer requirements and environmental concerns (Pintelon and Parodi-Herz, 2008). It was acknowledged that the production department should actively be involved in the planning of maintenance and that human behavior is crucial in preventing failures (Moubray, 1996). Management skills became important in maintenance.

A fourth phase in the development of maintenance is described by Pintelon and Parodi-Herz as ‘cooperative partnership’ (2008), where maintenance becomes a means to add value to the organization (Haarman and Delahay, 2004). Investing in the assets may deliver a higher added value than optimizing maintenance, and it becomes important to ‘speak the language of the board room’ (Haarman and Delahay, 2004).

Throughout this development, maintenance starts to be called Asset Management, “an organisation’s coordinated multidisciplinary practice that applies human, equipment and financial resources to physical assets over their whole life cycle to achieve defined asset performance and cost objectives at acceptable levels of risk whilst taking account of the relevant governance, geo-political, economic, social, demographic and technological regimes” (Pudney, 2010, p. 8). This definition shows the breadth of Asset Management: it combines different disciplines to achieve (corporate) objectives with the assets over their complete life and considers the context in which the asset operates (e.g. governance).

The literature mentions a large number of capabilities required for Asset Management. Pintelon and Parodi-Herz (2008) describe how technical, financial and business context should be taken into account to see ‘the big picture’, communication and management skills are needed and flexibility is required. Knowledge and information management is important as well (Longley et al., 2012), just as performance management (Schraven et al., 2011) and culture (Novak et al., 2017).

An important challenge that remains is the “threatening gap between the top management level and the overall maintenance strategy determination and the tactical level on which the maintenance concepts are designed, detailed and implemented” (Pintelon and Parodi-Herz, 2008, p. 45). This relates to the concept of a ‘life cycle approach’ to Asset Management, as the top management is strategically concerned with the complete life cycle of the asset, while maintenance concepts mainly consider the short term and operational issues. In order to address this gap, this paper will investigate how a an Asset Management organization can adopt a strategic ‘life cycle approach’, which, following Haffejee & Brent (2008), will be called ‘Asset Life Cycle Management’ (ALCM).

Methodology

The goal of this paper is to study a process of change, to develop so-called ‘actionable knowledge’: knowledge usable by practitioners and theoretically robust for scholars (Argyris, 1996; Coughlan and Brannick, 2014). This is exactly what Action Research aims to do, a methodology that aims to create ‘knowledge in action’ and which is ‘fundamentally about change’ (Coughlan and Coughlan, 2002). One of the underlying assumptions of Action Research is that “the best way of learning about an organization is by attempting to change it. The very process of change is likely to reveal factors which would not have been unearthed in a stable environment” (Eden and Huxham, 2006, p. 400). As we seek to understand what capabilities need to be developed in an ALCM organization, studying the change process from Asset Management towards ALCM is the best way to do so.

Project initiation

This research was carried out at Liander, a Dutch network operator, which will be further introduced in the results section. In 2012, Liander approached the researchers to start a joint change project to develop their Asset Life Cycle Management capabilities to change their Asset Management from reactive and operational to proactive and strategic. This desire and willingness to act made Liander an excellent case for our study of ALCM capabilities.

In order to deliver practicable and tangible outputs to Liander, the main focus of this research project was the development of Asset Life Cycle Plans (ALCPs), documents that discuss the strategic objectives of the company with the assets, its current performance, future threats and opportunities that may impact the future performance, and the policy measures to make sure the future performance meet the strategic objectives (Ruitenburg et

al., 2016). The ALCPs were used as a means to develop ALCM capabilities within Liander. This research follows the ALCPs as ‘artefacts of change’ within Liander.

Data collection

The Action Research project formally started in January 2013. From January 2013 to April 2017, the first author of this paper was present at Liander for on average one day a week. During this period, he collected data both about the development process of the ALCPs, as well as about the Asset Management organization in general. Data were collected by working on the ALCPs together with the asset managers, attending meetings, informal conversations and reading company documents (which allowed triangulation (Silverman, 2006)). Additionally, each ALCP was evaluated with the responsible asset managers in a semi-structured interview. After each day at the company, fieldnotes were written to capture what happened that day, as advised by Coghlan & Brannick (2014).

Results

Introduction to Liander

Liander is one of the three main Dutch network operators, responsible for the safe, reliable and affordable distribution of electricity to 3.1 million and gas to 2.5 million customers. Liander – a publicly owned company – operates and maintains the transportation and distribution networks for gas and electricity. The grids operated by Liander together represent a historical purchasing cost value of around 12 billion (milliard) euros. The reliability of these grids is comparable with the grids of other Dutch network operators (ACM, 2016), and among the most reliable in Europe (Wolse et al., 2017).

Within Liander, the Asset Management (AM) department is responsible for the purchasing, construction and maintenance of the assets in the grids. This department is governed by the management team AM (MT AM), consisting of the managers of the different divisions within the AM department. One of these divisions is the Policy & Standardization (P&S) division, responsible for setting the rules and guidelines for the design, purchase, construction, operation, maintenance and disposal of the assets of Liander. P&S is managed by a management team (MT P&S), consisting of a general manager, the managers of the electricity and gas sub divisions and two senior advisors.

Project background

In 2012, Liander was investigating how to deal with two complex challenges about the future of their assets. On the one hand, many assets were approaching the end of their designed lifetimes and many questions arose about the remaining lifetime of these assets. As large parts of the grids were constructed in the 1960s and 1970s, Liander was afraid of a ‘replacement wave’: a sudden and large increase in the need to replace existing assets, which it at that moment did not have the operational capacity to facilitate. The ageing of the grids is a widely recognized problem in Western Europe (Jongepier, 2007).

On the other hand, Liander saw the first consequences of the so-called ‘energy transition’ (e.g. Kern & Smith (2008)): the transition from centralized (fossil fuel based) energy production to localized energy generation from sustainable sources (mainly wind and solar) and the introduction of new applications of energy (e.g. electric vehicles, ground source heat pumps). This may have profound consequences for Liander’s grids.

These challenges should be seen in light of the particularities of these grids: the assets in the grids have designed lifetimes of 40 years, so any large scale replacements would cause a forced write-off of large financial investments. Additionally, a sudden increase in work volume due to ageing or the energy transition would require a far larger operational capacity than Liander had. Therefore, a tool such as the ALCPs, which could help Liander to better understand the future of its assets and the main Asset Management priorities resulting from this, seemed promising to Liander to further develop its ALCM capabilities.

Initial situation

The project started off with an exploration of the initial solution, to thoroughly understand the problem context. After a number of discussion sessions with the management team of the Policy & Standardization division (MT P&S), it was concluded that the main problem could be summarized as follows: “there currently is a limited and dispersed insight in the remaining useful lifetime of the assets (on the medium and long term) and an integral view does not exist” [July 2014]. Underlying this problem statement lay a number of causes.

First, limitations in the availability and reliability of data hampered Liander’s efforts to estimate the remaining useful lifetime (RUL) of its assets. Additionally, it was realized that the energy transition could significantly change these RUL estimations.

Second, the policy documents written by P&S were very diverse in target group, aim and level of specificity. Additionally, at the inception of the project about 180 documents existed. As a result, these documents did not create an integral understanding of the assets.

Third, most asset managers working within P&S had a technical education and many years of experience in operational departments. As a result, other topics (e.g. financial or sustainability) received less attention, which also limited the integral overview of the assets.

Fourth, different divisions and departments were dealing with different aspects of the assets, and as a result asset related knowledge was not always shared throughout the organization. This limited the integral overview of the assets.

Finally, the asset managers of P&S indicated that a large part of their time was consumed by all kinds of operational questions and short term priorities. This their ability to develop an integral overview of the remaining useful lifetime of Liander’s assets.

The consequence of not having an integral overview of the future of the assets was also felt by the P&S MT. In the discussion of the problem statement, their main concern resulting from this limitation was aired: “(therefore) it is difficult to answer the (strategic) questions from the management team [MT AM] in a fast and unambiguous way”. To address this issue, P&S formulated the main question for this Action Research project as: “how do we create a strategic, business-oriented and integral overview of the remaining useful life of our assets and the extent to which our assets are future-proof?” [July 2014].

Interventions

The main activity in the Action Research project was the development of ALCPs for Liander, where the ALCPs were used as an ‘artefact of change’ to develop ALCM capabilities within the organization. The Action Research project took place from January 2013 to April 2017. **Figure 1** presents a timeline of this period, showing the ALCPs created in the project (blue) and the main interventions (orange) carried out by the research team. In the remainder of this section, the change process will be discussed, focusing on the main interventions (indicated by the corresponding letter between <angle brackets>) and the ALCPs (indicated by the corresponding number between (parentheses)).

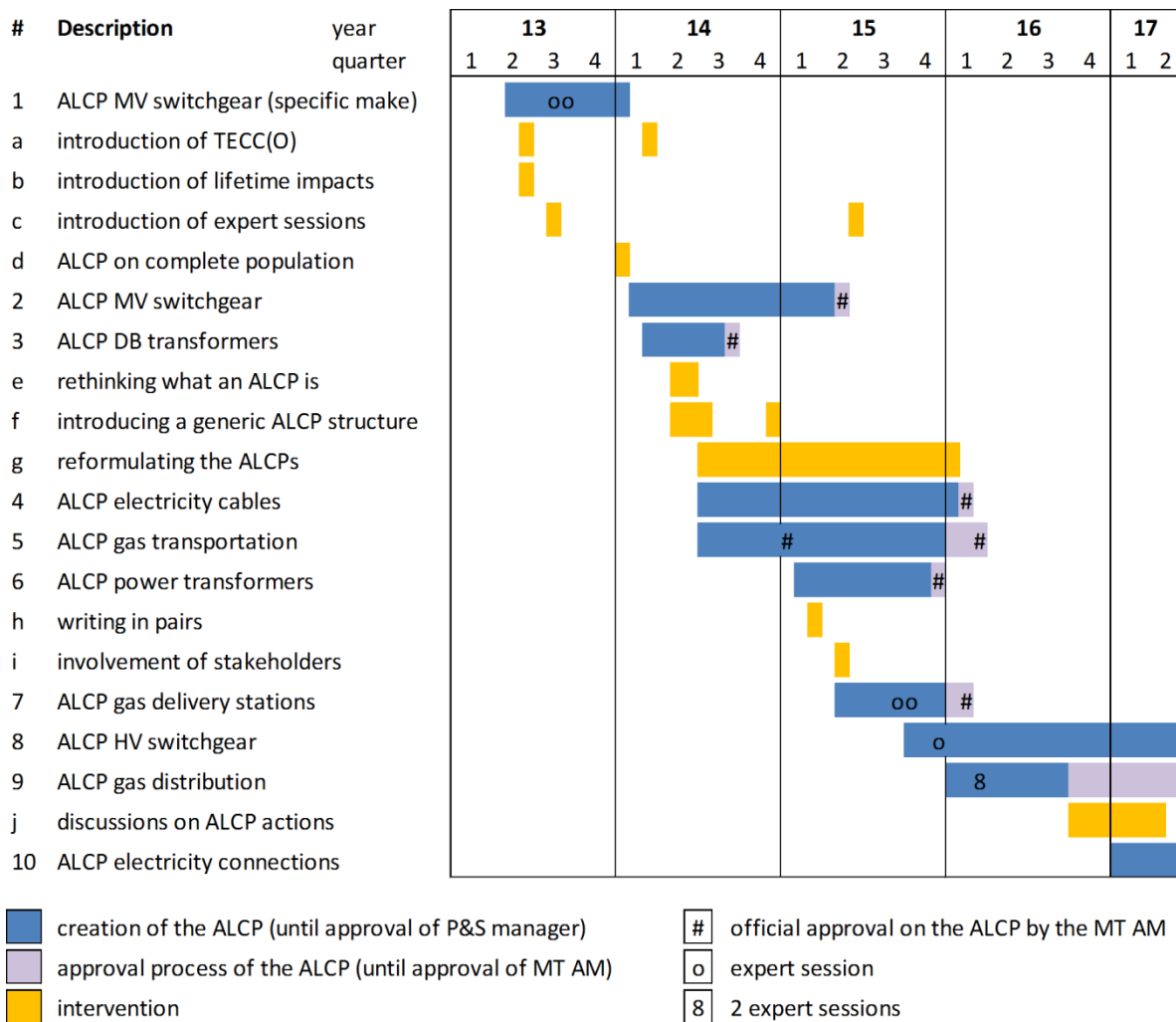


Figure 1 – timeline of the project, showing the interventions <orange> and ALCPs (blue)

The very first ALCP concerned a population of medium voltage switchgear from a specific make (1). This population was selected by Liander as much information was available about the asset. The main goal was to establish the RUL for this population of assets, based on quantitative information. However, it was soon discovered that even for this asset the quantitative data did not suffice for a data-based RUL estimation. Additionally, to gain an integral overview of the future of the assets it was decided that a multidisciplinary approach was necessary. Therefore, TECC was introduced <a>, a focus on technical, economic, compliance and commercial aspects of the assets, as proposed by Van Dongen (2011). Later in the project, TECC became TECCO as the need arose while writing ALCP (3) to also include organizational aspects into the analysis.

Also, it was decided to focus the data collection on the identification of impacts on the RUL or the performance of the assets, rather than on the estimation of the RUL per se. After all, knowing the RUL is only relevant if it can be reached. Therefore, it was decided to focus at those issues having a potential impact at the lifetime of the assets, which were called ‘lifetime impacts’: “probable (technical and non-technical) events or trends that may have a positive or negative influence on the value creation through the use of the asset in the intermediate or long term”. To identify these lifetime impacts, two expert sessions were

organized with experts from different backgrounds and disciplines <c>. These expert sessions and the available data were the inputs for the ALCP.

In the evaluation of this first ALCP, it was argued that its level of detail was too high. Also, the document was mainly a description of the current situation, “giving information that should be there, but not in the ALCP” [member MT P&S, May 2014], as the ALCP was expected to use this knowledge to create insights valuable for the MT AM, rather than just to present all information available. To make the ALCP more relevant for the MT AM and to reduce its level of detail, it was decided to focus future ALCPs on a complete population of assets (e.g. all medium voltage switchgear) <d>. Another reason for this choice was to limit the number of future ALCPs and the corresponding effort required to write and regularly update these ALCPs. To make the ALCPs more fit for the MT AM, the desired scope and goal of the ALCP were discussed with the MT P&S <e>.

Following up on these discussions, a document structure for the ALCP was developed <f>, to make clear what information should be presented in the ALCP. This structure also addressed a need from the asset managers, who continuously asked for clear guidance regarding both the desired contents of the ALCP and its structure. The developed structure was highly appreciated by the asset managers: “the structure was a great help” [writer of ALCP (4) – July 2014]. Nevertheless, most ALCPs (except (7) and (9)) required extensive rewriting by members of the MT P&S <g> in order to make them suitable for the MT AM.

In the evaluation of the second ALCP (2), it was found that the lead time of writing this ALCP was quite long. That was partly caused by the changes in the goal <e> and structure <f> of the ALCP, but also because the asset manager was often occupied with all sorts of operational questions and demands. And if these come, “than we work on them, that’s also part of our job description, so I understand the need, but then we as a group [P&S] must also realize that that [giving other tasks a higher priority than the ALCP] has consequences for the lead time [of the ALCP]” [writer of ALCP (1), (2) and (8) – November 2015]. To prevent the ALCP writing process being interrupted from all these emerging tasks, it was decided to start working in couples <h> to reduce the impact of interruptions.

Another reason for long lead times lay in the decision making process to get the ALCPs approved. The best example is presented by ALCP (5), which was approved more than a year after it was first discussed in the MT AM, as very different views about the future of these assets existed in the MT AM. This was mainly caused by a lack of information exchange between the writer of the ALCP and other AM divisions (no expert sessions were held for this ALCP). Therefore, it was decided that the later ALCPs should put effort into the timely involvement of stakeholders and decision-makers in the writing of the ALCP <i> in order to develop a broadly supported and shared view on the future of the assets.

As the ALCPs matured and became more strategic in nature, also the actions ranging from the ALCPs became more strategic and integral. As a result, the actions lay not always within the direct span of control of the asset manager, but were considered to be the task of other divisions. This issue was discussed and analysed at length <j>, and resulted in the conclusion of the MT P&S that the asset managers should follow up on these lifetime impacts, as their role was not considered to be just an advisory one, but also to include a responsibility for the performance and future value of the assets for Liander at large.

Asset Life Cycle Management capabilities

The change process at Liander also offers us the opportunity to learn about the capabilities needed for strategic and proactive ALCM. In this final part of the results section of this

paper, the discussion will focus on the need for ALCM capabilities that emerged during this change process. Five different capabilities will be discussed: 1. using information in a strategic way; 2. relating with both higher management and operations; 3. creating a joint understanding on the asset using the expertise from different disciplines; 4. focusing on both short term operational issues as well as long term strategic topics; and 5. exerting control over the assets even outside the official span of control of the asset manager.

A first notable competence is the ability to deal with imperfect data. At the inception of the project, the asset managers felt greatly limited by the availability and quality of the data they needed, as according to them the imperfection of the data made it impossible to use the data at all. But this changed over time, as the asset managers no longer felt obstructed by the lack of data. Rather, they learned that for the purpose of the ALCP, very accurate and precise estimations (e.g. of the RUL) were not necessary. Instead, the ALCP should globally sketch the future of the asset, and also limited data can often be used to create such a picture. In the words of one of the asset managers: “because back in the days we did not register everything accurately, one has to deal with a level of uncertainty. That is not a problem [for the purposes of the ALCP], but if it [the uncertainty] is too large it does become a problem” [writer of ALCPs (1), (2) and (8) – November 2015]. Also, they realized that their knowledge and experience was a valuable complement to the data and thus should be used accordingly. An interesting case was presented by the ALCP gas transportation (5), where the analyses of the data predicted a stark increase in the amount of replacements needed in the near future, while the asset manager did not see this based on his experience and contacts within the organization. A few months later a further analysis of the data proved his intuition right, as certain assumptions within the model did turn out not to be true. To summarize, a first capability for ALCM is *the ability to abstract the main trends out of imperfect data and to complement these with knowledge and experience*.

This different way of interpreting data relates to a second competence: *the ability to relate with the concerns of the higher management, based on a clear understanding of the assets and the operations*. The ALCP started with concerns from the MT AM regarding the future of the grids in the face of ageing assets and the energy transition. By starting the ALCP with the strategic objectives with the assets and involving experts from the operations in the expert sessions, alignment was created between these two levels within the organization. In the words of one of the asset managers: “we are often occupied with very individual asset risks, for small groups of assets. And that limits one’s attentiveness towards strategic developments. By making an ALCP one moves to the tactical and strategic level, that’s what the ALCP is about” [writer of ALCPs (3) and (6), Oct 2014].

This ‘vertical alignment’ – ranging from the strategic concerns of the higher management to the operations – needs to be complemented by a ‘horizontal alignment’ over different departments and disciplines. The asset manager should have the skills to bring all information relevant for the assets together. The asset manager does not have to be a specialist on all topics, but should be able to bring it all together. In the words of one of the asset managers: “you need to have a specific type of person who does it [writes the ALCP]. You are not looking for a specialist [literally: a person with a great eye for details], because they immediately go into great detail, but you do [emphasis] need someone who has the technical understanding of everything that is going on” [writer of ALCPs (3) and (6), Oct 2014]. This also relates to the communicative skills of the asset manager, to timely and actively involve stakeholders early in the process, which resulted in a broadly supported ALCP. Therefore, the third capability can be described as *the ability to connect*

with the experts from different disciplines relevant for the asset and to jointly create an understanding of the future of the assets.

This aligning and connecting role also results in a lot of demands being made, questions being asked and issues to be dealt with. However, this daily stream of requests does not fit with the long term and strategic focus of the ALCP. This was acknowledged by the writers of the ALCP, the main advice of one of them for future ALCPs was to “structurally reserve time [...] for working on the ALCP in order not to let one be driven by the day-to-day hustle and bustle” [writer of ALCP (1), (2) and (8), Nov 2016]. This points at a dual time perspective needed in asset management: on the one hand on the daily (operational) affairs and problems, on the other hand the future (strategic) directions and outlook. In an earlier interview, the same asset manager told how the ALCP helped to create this dual perspective: “you are pulled out of the day-to-day hustle and bustle [by the ALCP] and have to put more thoughts into the future. That adds an extra dimension to us as asset managers” [writer of ALCP (1), (2) and (8), Nov 2015]. As it turned out that combining both perspectives is hard to do by a single person, later ALCPs were written in teams. To summarize, the fourth capability can be described as *the ability to simultaneously focus on short term operational issues and long term strategic topics.*

A final competence developed further during the Action Research project was *the ability to take control over the (performance of) the assets even outside their direct span of control.* When the research started, the main activity of the asset managers was to develop maintenance and design instructions and to develop policy solutions to mitigate operational risks (e.g. safety risks). The first ALCP (1) was mainly a description of the performance of a subpopulation of assets, resulting from these instructions and policies. Over time, the ALCP developed into a more prescriptive document regarding the Asset Management strategy for a complete population of assets. This was felt by the asset managers as a way to exert influence in the asset management organization. “We are working on a project ‘ageing assets’ with [an OEM], but we cannot get it into motion, and by making an ALCP you are able to make the MT [AM] aware of what needs to happen, to use them as a lever to get these trajectories into motion” [writer of ALCP (1), (2) and (8), Nov 2016]. Also, the ALCPs identified lifetime impacts that did not fall within the span of control of their normal tasks and job description. For example, a threat identified in most ALCPs was the reduction of skills and expertise among the technicians doing construction and maintenance work. However, the asset managers of P&S did not have any influence on the skill levels of the people executing these jobs (sometimes even employed by external service providers). As a result, the ALCP created a tension between the intended actions of the asset managers and their official role and mandate. Coping with this tension and exerting influence for the better of the assets is the fifth ALCM capability emerging from this research.

Conclusion

Strategic Asset Management requires a focus on the complete life cycle of physical assets, from a multidisciplinary perspective. However, even though the goal to reach is clear, the process to get there is far from self-evident. The literature and practitioner standards such as ISO 55.000 do not offer any guidance regarding this change process. Therefore, this paper set out to describe the change process from Asset Management towards ALCM and to investigate what capabilities are needed for strategic and proactive ALCM.

To start this change process, Asset Life Cycle Plans were introduced as an ‘artefact of change’ in Liander’s Asset Management. During this Action Research project, which lasted

over 4 years, a number of interventions were made by the researchers to develop the ALCPs into documents creating a strategic view on the future of the assets.

Abstracting from the change initiated by the ALCPs, five important ALCM capabilities emerged from this research. First, it is important to be able to interpret data in a more strategic way, focusing on the main trends than on the imperfections of the data. Additionally, asset managers could use their knowledge and experience to complement the quantitative data. A second capability is to be able to relate both with the concerns of higher management as well as with the operations and the characteristics of the physical assets. A third ability lies in establishing the connection with experts from different disciplines relevant for the assets and to create a joint understanding of the future of the assets among the experts. Fourth, strategic ALCM also requires a combination of two different time perspectives: on the one hand on short term operational issues, on the other hand on long term and strategic matters. Finally, as a result of all the (organizational and time) boundaries crossed in strategic Asset Management, the final competence required is the ability of the asset manager to take control over the (performance of) the assets even outside his direct span of control. Only by exerting influence also outside his direct mandate, alignment can be created and the maximum value of the assets can be realized.

Limitations and implications

The main limitation of this study is inseparable from the Action Research methodology used in this research, namely that only one change process has been studied. This results in a deep understanding of this unique situation that could not have been reached in any other way, but also raises the question which of the findings are context dependent, and which are more generic. During the research, this question has been addressed by confronting our emerging findings with the literature as well as with the experience of asset managers in other organizations. Therefore, we are confident that the capabilities discussed in this paper bear scientific relevance also outside the unique situation of the change process studied.

This research has a number of implications for Asset Management practitioners. First, it is important to realize the importance of aligning Asset Management to the strategic concerns of higher management and even the board of directors. However, doing so requires a set of capabilities that may not yet be fully developed in an Asset Management organization. This paper discusses the five main capabilities that are crucial to do strategic Asset Management, a second important implication of this paper. Thirdly, it is important to realize that developing these capabilities will take time. Fourth, using a tangible ‘artefact of change’ – such as the ALCPs in this paper – may be a useful means to bring about such a change in the ALCM capabilities. Finally, it is important to realize that every initial situation is unique and therefore each change process will be unique as well. Rather than using this description as a blueprint for such a change process, it is meant as a narrative about a unique process from which generic findings emerge. It is these generic findings that are useful for practitioners going through the same change process in their unique situation.

Acknowledgements

The authors wish to thank Liander for initiating and funding this research project. Additionally, the first author would like to thank all the experts who cooperated in the development of the ALCPs. Special thanks go to Ihsan Karakoc, for his constant support and enthusiasm.

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