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CONTENT

MONDAY

Forum 1	3
Assessment and Benchmarking of Maintenance Activities	
Forum 2	24
Effective Asset Management	
Forum 3	76
Recruiting, Education, Training and Certification	
Forum 4	91
Managing Business Risks in Health, Safety and Environment	
Forum 5	131
Maintenance in 2020: A European Strategy	

TUESDAY

Track A	141
World Congress / GFMAM-session	
Track B	154
Strategic Asset Management	
Track C	194
Effective Maintenance Management	
Track D	231
Value from Physical Assets with Effective Solutions	

WEDNESDAY

Key Notes	273
Track E	279
World Congress on Maintenance and Asset Management	
Track F	325
Effective Maintenance Management	
Track G	389
Leadership, Education and Certification	
Track H	454
Value from Physical Assets with Technological Solutions	

Track E

World Congress on Maintenance
and Asset Management

Railroad to PAS 55 certification for a young public transport authority

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Abstract

Increasing professionalization and need of standardization in the field of asset management leads to growing interest in PAS 55 / ISO 55000 certification. Whereas the theoretical side has been discussed extensively, this paper addresses the practical side of implementation of the PAS 55 standard (IAM and BSI, 2008) in a Dutch light rail organization.

This paper evaluates the implementation process to date, about one year before the deadline. This process started with establishing the baseline through an Asset Management assessment. This gap analysis was done in January 2012 and will take approximately 3 years to get the organization from an average “awareness” level 2 to “competence” level 3. Based on the result of the assessment actions were identified that have to be executed and implemented for a successful certification. The paper explains how these actions were bundled in so called ‘work packages’, how progress is monitored and how the project is managed. The experiences so far are shared, including pitfalls. Main topics are; how to cope with the inter-dependency of the work packages, synchronization of the results and the difficulties of executing such a change project simultaneous with day to day business. The paper concludes with some lessons learned.

1. Introduction

Bestuur Regio Utrecht (Greater Utrecht Region, BRU) is a partnership of nine cities in the region of Utrecht (the 4th largest city in The Netherlands) and the Legal Authority for public transport in this region. The light rail system between Utrecht and the satellite cities started operations in 1983 and is one of the most important public transport connections in this region. Daily, 40,000 passengers use the tramway. The fleet consists of 36 trams, 23km rail track (standard gauge,

segregated tramway), 23 stations and a depot in Nieuwegein.



Picture 1 Tram from Bestuur Regio Utrecht (Source: BRU)

2. Context

Until 2008, all assets were owned and managed by different parties (private public transport company and Dutch state owned mainline network operator). For several reasons BRU decided in November 2008 to take matter in their own hands and became asset owner and asset manager of the above-mentioned assets. This decision was based on the following factors:

- The necessity by law to create a level playing field for the public transport concession;
- The national policy that light rail infrastructure is handed over to regional governmental bodies;
- The demand for expansion of fleet and network;
- The complex environment of the tramway by means of numerous and risky interfaces with other projects and developments in the region.

After its dramatic decision BRU started to build fast an Asset Management organization, to ensure safe and reliable operations of the light rail system. In 2.5 year time, the organization was

transformed from a temporary project organization (with a tramway in full operation) to a fully equipped lean & mean Asset Management organization in a basic going concern phase. The article written by Leeuwen (2001) explains this decision more extensively and highlights the implementation stages.

To give the Asset Management organization more clout, a semi-independent tramway company "Regiotram Utrecht" was founded. BRU felt that in this way, the Asset Management organization could act more adequately to the daily worries of the tramway. To speed up further maturation and professionalization, in December 2011 the decision was made to head for a PAS 55 certification of "Regiotram Utrecht", to be obtained at 31st of December 2014 the latest. Regiotram uses the PAS 55 certification as a crowbar to get things done; the organization had good experiences with a similar approach: the implementation and certification of a safety management system (SMS) in the first years of its existence.

Regiotram Utrecht knew that to be able to realize this ambitious goal, external knowledge about and experience with preparing an organization for PAS 55 certification was needed. It contracted IES Asset Management (IES), one of the leading Asset Management consultancies in The Netherlands, to execute this project as an assignment with result obligation.

3. Method / Approach

3.1 Setting a baseline

As a starting point and to set a baseline in January 2012 an assessment was done at Regiotram by means of the Asset Management workbench® (AMWb®). The AMWb® is a fully PAS 55 compliant assessment tool developed by IES.

The management team of Regiotram Utrecht supplemented with asset managers and the configuration librarian were invited for a two day group assessment. Guided by two experienced assessors the group had to determine to what extent a certain asset management process is developed within the organization. In total the organization was tested on 12 of 14 asset management processes as identified in the AMWb®:

1. Strategy formulation
2. Performance management assets
3. Configuration management

4. Management of the maintenance concept
5. Engineering
6. Financial management
7. Spare part management
8. Procurement of the assets
9. Contract management
10. Management of the workflow
11. Management of information
12. Continuous improvement
13. Organization & employees
14. Risk management & SHE.

Processes 7 en 10 were excluded because BRU does not execute these processes itself.

For each of the processes the ANWb® has predefined 5 levels of best practices (BP) and key performance indicators. The group had to choose the description that fitted their situation best and in this way the level of development is determined groupwise. This assessment was repeated in Q4 2013, to measure progress. Figure 1 shows the result of both assessments (IES 2012, IES 2013). A score of 4 on the 5-points scale means sufficient for PAS 55 certification.

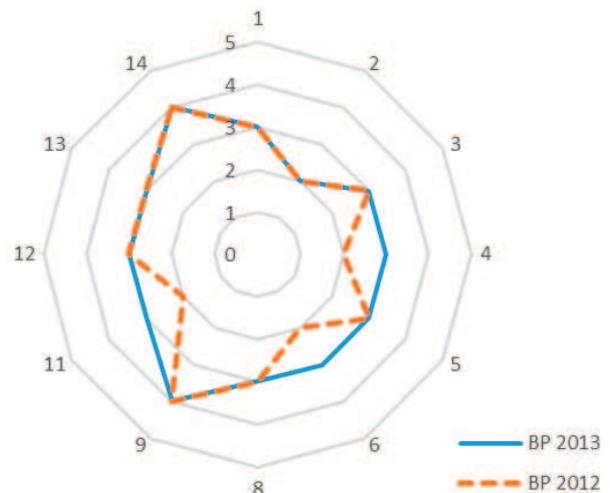


Figure 1 Spider with the AMWb® results

If a process scored less than a 4 the group had to formulate what measures should be taken to close the gap. These measures are called "improvement actions" and are listed in the report of the assessment.

3.2 Work packages

The improvement actions from the 2012 assessment have been bundled based on topic or specialism in so called 'work packages' (WPs). A large part of the WPs exist of setting up and implementing new processes of activities and the improvement of existing processes and activities. The topics of the WPs are very broad, some

examples are: Develop a communication plan for communication with stakeholders; Develop risk based maintenance concepts for infrastructure and rolling stock; Set up a contingency plan. Some WPs are interdependent which means a careful planning is essential. Figure 2 shows the initial WPs including topics and initial planning in time.

3.2.1 Coherence

The work packages aim to realize three main goals:

1. Implementation of 'good asset management practice'
2. Execution of effective and efficient management
3. Realization of the required performance.

The second and third goal are also important conditions for successful certification because herewith the organization proves to comply to the PAS 55 requirements in practice and not only on paper.

Realization of the work packages leads to realization of a sub goal. The sub goals contribute to the realization of one of the three main goals. Figure 3 visualizes the relation and coherence of the main goals and sub goals. The improvement actions from the 2012 assessment have been bundled based on topic or specialism in so called

'work packages' (WPs). A large part of the WPs exist of setting up and implementing new processes of activities or improvement of existing processes and activities.

3.2.2 Integration with other projects

At the time the PAS 55 certification project started there were other projects and initiatives running or starting that would lead to the improvement of asset management related processes as well. Further, during the PAS 55 project, new improvements and ideas might come up. BRU and IES decided to combine these projects and initiatives as much as possible with the existing work packages, sometimes leading to new WPs. Summarized, the input for the WPs could come from four different sources;

1. The AMWb® assessment;
2. The foundation of Regiotram Utrecht (restructuring issues);
3. Evaluation and actualization of the SMS
4. Improvement actions descending from the regular 'going concern' process.

In this way implementation of the WPs lead to;

- a. PAS 55 certification of Regiotram;
- b. An optimal set up of the Regiotram organization.

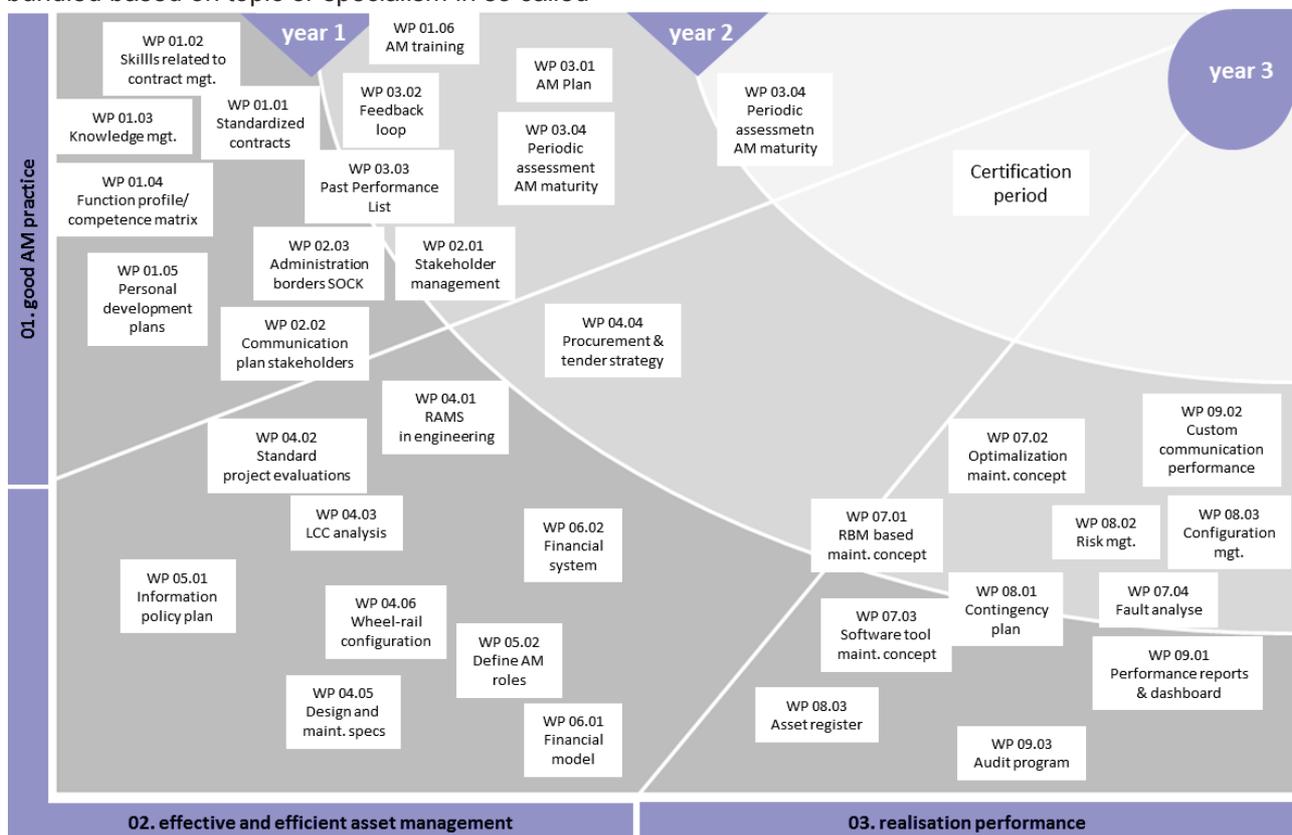


Figure 2 Overview of the initial work packages and their planning

The advantage of this approach is that with the implementation of the WP the particular improvement action is completed at the same time. Otherwise the separate improvement action has to be carried out another time and the topics might stay unfinished. The disadvantage is the risk of the project growing too big through adding extra improvement actions.

3.3 Workload

At the start of the project a project manager was appointed. Then, each WP was assigned to a member of the management team at that time, generally guided by the area of responsibility of the member. This member has been called the process owner of the WP. After delivery he is accountable for the correct utilization of the delivered product and to update it when required. In addition, a project leader was assigned to each WP. His responsibility is a timely and accurate delivery of the WP. He may delegate the execution of tasks to others but stays responsible. The project leader has to deliver a result the process owner will accept, so discussion and cooperation between the two now and then is inevitable.

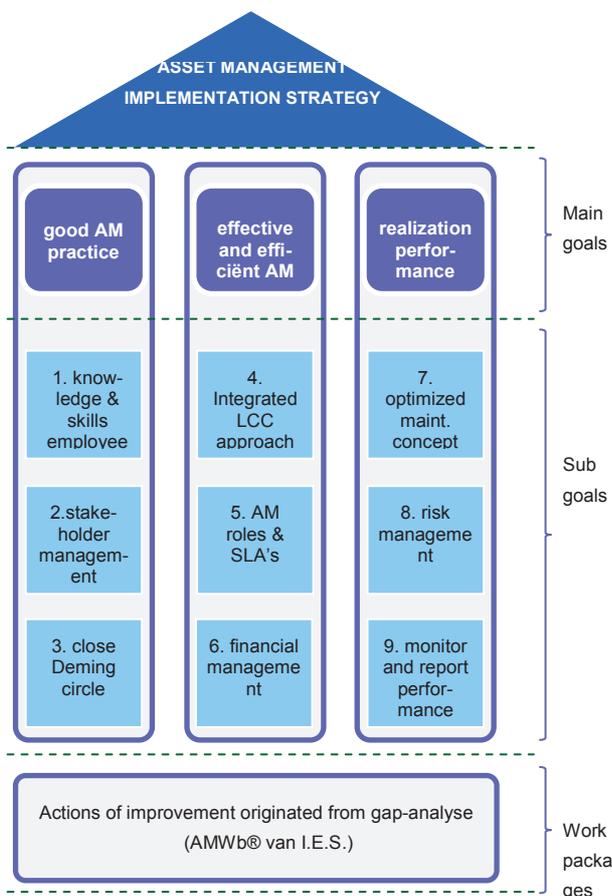


Figure 3 Visualization of the coherence between the main goals and sub goals

BRU assumes her employees are task mature specialists therefore the details and procedure for execution of the WP were not spelled out, only a brief description of the required result has been given. The project leader was asked to write a one page action plan for a timely and accurate delivery of the WP. The following aspects had to be addressed; goal, approach, input, output, relations with other WPs, constraints and principles, people involved, points of interest, start and end date. This action plan had to be approved by the PAS 55 project manager. After approval it functioned as the starting point for progress monitoring.

3.4 Organization & project management

The PAS 55 certification project is executed as an assignment with result obligation. The (interim) manager Asset & Maintenance Management at Regiotram Utrecht is accountable for the end result. As stated before, specifically for the certification project a project manager is assigned. Both are hired from IES. The line responsibility of the manager Asset & Maintenance management makes it possible to determine priorities and to escalate in the MT when necessary in favor of the certification project. Without this factor it would be hard for a third party to take certain decision

The core tasks of the project leader are:

- assure the results meet the PAS 55 requirements;
- assure the results of different work packages are in line with each other;
- prevent overlap between work packages;
- monitor progress;
- report to the management team and escalate when necessary.

Most of the work packages are carried out by BRU employees but when external knowledge or experience is necessary third parties are hired.

3.5 Monitoring progress

At least once in six weeks a meeting is being held between project manager and project leader in which the progress is discussed. The project manager keeps a brief record of every meeting. The goal of the progress meetings is to identify if there are any risks for timely or accurate delivery. Next to that the project manager facilitates cooperation between WP workgroups and share knowledge and experience between the workgroups.

The bi-weekly report to the management is being done by a tracking scheme with color indication for the progress of each WP. Attached to the

tracking scheme is a memo in which critical issues and relevant events are described.

3.6 Procedure for delivery

A formal procedure for delivery was needed to facilitate the approval by process owner and management team and to prevent that WPs stay unfinished unnoticed. The procedure in short reads as follows. Project leader hands the finished WP over to the process owner. After approval, the project manager checks the result with the PAS 55 standard and if okay, the WP is presented to the management team for final approval. Finally the result becomes property of the process owner who is responsible for implementation in the daily process.

3.7 Measuring progress

As stated before, in Q4 2013 a second AMWb® session has been held with the aim to monitor progress since the first AMWb® in Q1 2012. The outcome of this assessment showed significant improvement but also that there is still a lot to do. Some recommendations were;

- More explicit decision making, recording and communication is necessary;
- Implement procedures fully;
- Add more coherence in between risks and performance indicators and between requirements and agreements;
- Restructure and combine WPs;
- Stricter monitoring by the management team.

3.8 Certification process

For governance reasons IES (endorsed assessor¹) did not want to certify Regiotram, so a third party was sought. Regiotram Utrecht required an endorsed assessor with Dutch speaking auditors and with some experience within the (rail)infrastructure. Grontmij got the assignment. The assignment consisted of 2 parts; an intake in Q4 2013 and the certification process, scheduled for Q3 2014.

3.8.1 Intake

The goal of the intake is to obtain a second opinion from an objective third party next to the second AMWb® from IES. In this way possible differences between the views of IES and Grontmij on the maturity level of the asset management processes of Regiotram could become visible and solved in time. Grontmij has used the PAS 55 Assessment Methodology (PAM)² for their gap-analysis. The report is

expected to be brought in the first half of January 2014. That means enough time should be left to close any unexpected gaps.

3.8.2 Assessment and certification

Grontmij will assess the implementation process from January 2014 on. On a monthly base progress will be discussed and Grontmij assesses each finalized WP to the PAS 55 certification level, to prevent unwanted surprises in the certification stage. From Q3 on the certification process starts and Grontmij will again use the PAM.

4. Lessons learned

4.1 Define the required result as sharp as possible

The formal approval of a WP via the procedure for delivery does not guarantee all the work is done. For example one of the WPs was to set up an information management plan. The plan is ready and approved but it has not been implemented yet, so one could say the definition of the result in the WP was not sharp enough. Next time we would take more care to explicitly describe the results necessary for certification.

4.2 Communication of the results and ensuring usage

Once the WP is formally approved the result has to be communicated to the relevant employees and stakeholders. Secondly, if the result is a principle, strategy, process, form, etcetera, it has to be stored in a place people can find it. Thirdly, a way has to be found to assure people use the new process or form when it is applicable. We have sent emails to inform our people, saved the result on a logical place on the server and trust the responsible managers will remind the employees to use the new processes and forms. However, this is not a watertight solution and we are working on improvement, for instance by appointing the role of a quality improvement manager.

4.3 Getting AM in the hearts and minds

People tend to do things the way they have always done them. Of course, this fact turned out to be true for this project. We want people to fully embrace the asset management 'philosophy'; to link every single action they do to the business goals of Regiotram Utrecht; to think in Life Cycle Costing (LCC), etcetera. Even the asset owner, BRU, is not fully aware of the important role he plays and needs education on how to fulfill this role best. Thinking 'in asset management' does

¹ By the Institute of Asset Management (IAM)

² Tool developed for PAS 55 certification by the IAM

not just happens on its own or because we are implementing PAS 55 in the organization.

The first step will be an asset management training course for all Regiotram Utrecht employees, due Q2 2014. Additionally, the department managers will play an important role by reminding, facilitating and challenging their people to work according to the asset management philosophy. A third step must be assessing the knowledge and experience level of each employee and relating their personal development plan to the asset management principles and objectives of Regiotram. In that way, the line of sight will be implemented. We found out, that in practice all this takes more time than we originally thought. In fact, we are lucky, because we are implementing PAS 55 in a relatively young organization like Regiotram Utrecht. Because we started in a Greenfield situation, many processes did not exist so we could and can do it first time right. For other, older organizations it could be much harder to change the way people work and think.

4.4 Start small and grow

People prefer to create things perfectly and complete right at the beginning. We found that in such a large project it is wise to start small and build further when it is needed (and there is time). For example, instead of setting up an extensive Key Performance Indicator (KPI) tree related to IT systems and databases, start with an Excel file and a limited set of KPI's.

4.5 Time and delay

4.5.1 On top of daily work

For many employees the execution of a WP means extra work on top of their daily tasks. Although most of them were and are absolutely positive about the project, it turned out to be a challenge for them to find enough time to work on it. This problem could be solved by hiring extra people or by allowing more time for implementation.

4.5.2 Do not underestimate project management

At the start of the project we calculated that 1.5 to 2 days a week would be sufficient for the project manager to coordinate and monitor the project. In practice it turned out to be 3 to 4 days a week. More than double our estimation. This was partly caused by the combination of tasks, because the project manager was assigned to lead some WPs as well. The advantage hereof was that the

project manager could familiarize with the organization relatively fast and that Regiotram Utrecht could make use of specific knowledge of the project manager. The obvious disadvantage is that it costs more time.

4.6 Changes in formation

The project had to endure a change of guards twice. At the start of the project some WPs were assigned to project leaders for whom the vacancy was still open. In some cases it took about four months before the vacancy was filled. Secondly, due to the growing nature of Regiotram Utrecht it employed quite an amount of employees on a temporary base. This policy was recently revised and the self-employed employees are being replaced step-by-step by employees with a fixed employment around Q4 2013 and Q1 2014. Both situations led to a delay in the execution and delivery of the WPs that was not foreseen.

A second consequence of the absence and change of project leader was their reduced involvement. Several times a project leader was starting up or rounding off through which the WP did not have his/her full attention or priority and in other cases the vacancy was not even filled. This is another reason why completion of the WPs has gone slower than expected.

The lesson we have learned is that every change in occupation, small or large, leads to a delay. And next time we should take these kind of occasions into account and reserve more slack time in the planning.

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