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ISO 55001 Certification at EPAL – the pains and the gains

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Abstract

In the second half of the 2000s, EPAL developed an integrated approach to asset management, designed according to the logic of PAS 55. Since then, asset management has been recognized as an invaluable function within the company and the portfolio of measures identified in the above-mentioned integrated approach has been implemented. With the release, in 2014, of ISO 55001, certification of the asset management system was made possible. Given the work already developed towards the deployment of asset management at EPAL, and because this had been based in the PAS 55 philosophy, EPAL was well positioned to obtain the ISO certification. The key challenges regarding the above-mentioned process were associated more with the implementation of the asset management at EPAL, rather than with the certification in itself. Because asset management was already an established practice at EPAL, key benefits of the certification are related to the documentation of such practice, which is something very important that was missing. Preparing for the certification also enabled the redesign of the Corporate Management System in order to meet the ISO and appendix SL requirements, making it more robust. And, of course, ISO 55001 certification became an asset in terms of image and reputation for EPAL!.

Key words: asset management, ISO 55001, risk management, strategic asset management plan

INTRODUCTION

EPAL – Empresa Portuguesa das Águas Livres, SA – supplies drinking water to around 3 million people, more than a quarter of the Portuguese population, through two water treatment plants, 31 pumping stations, 28 reservoirs and 700 km of trunk mains. In the city of Lisbon, the company is also responsible for direct supply to domestic and industrial users, serving approximately 350,000 clients, 540,000 inhabitants via 11 pumping stations, 14 reservoirs and 1,400 km of mains.

As a result of its activity, EPAL is a capital-intensive company, and its assets represent a very significant weight in the cost structure, which is at the same time the basis of the service it provides to its customers. Thus, asset management plays a key role in optimizing the return associated with the use of infrastructures and ensuring adequate levels of service.

In this context, EPAL developed, in the second half of the 2000s, an integrated approach to asset management, designed according to the logic of PAS 55.

Over the last ten years, EPAL has fully implemented the above-mentioned approach and asset management (Serranito *et al.* 2009) has long been recognized as an invaluable function within the company. In fact, it allows support for decision-making and aligning the different functions related to the assets' life-cycle phases in such a way that it generates value to the business – either by avoiding unnecessary risks or costs, or by taking advantage of upcoming opportunities or profits (Luís 2018).

With the release, in 2014, of ISO 55001, certification of the Asset Management System was made possible. Notwithstanding, it was only in 2018 that EPAL obtained its certification, and yet still becoming one of the first companies in Portugal to achieve it.

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Here, we will share the pathway that led EPAL to obtain the ISO 55001 certification, including the challenges and the benefits associated.

METHODOLOGY

Meeting the certification requirements was made possible by following three main steps: (i) implementation of an integrated asset management model; (ii) assessment of the eligibility of EPAL for ISO 55001 certification; and (iii) creation of an 'Asset Management System Committee' and an 'Asset Management System Operational Coordination'.

Implementation of the integrated asset management model

The implementation of the integrated asset management model was based on a methodological approach, comprising the themes of Organization, Processes, Data, Information and Information Systems (Capela *et al.* 2014), so that decision support tools could be developed and applied, in order to optimize the asset return and increase value for all the stakeholders: clients, regulator and owner. While the definition of the model took around seven months to complete, its full implementation at EPAL was carried out over the following four to five years.

In fact, a team of consultants was hired to define the integrated asset management model for EPAL, together with an internal team comprising one representative from each of the IT, Financial and Planning Departments, who liaised with colleagues from the other departments. This combined team (consultants/internal team) began by analyzing the situation of the company according to each of the above-mentioned themes. Then, which model to follow in each of those themes was defined. Finally, by comparing the reference situation with the defined model, the initiatives necessary for the implementation of an integrated asset management model in EPAL were identified.

The organizational transformation of the company was the first initiative deployed, with the creation in 2008 of the Asset Management Department. This Department, in turn, had the responsibility of ensuring the implementation of the remaining initiatives, as shown in Figure 1.

Regarding the Processes theme, the main processes and sub-processes required for EPAL's integrated asset management were identified. These covered not only the Asset Management Department process, but also the processes regarding all the stages of the assets' life-cycle at EPAL, from their planning, construction and acquisition to their operation, maintenance, rehabilitation and disposal.

As for the Base Structures (Database) layer, a dictionary of assets and matching rules and attributes was prepared. This document identifies EPAL's assets and group of assets, describes them and identifies their borders. For each type of asset, the associated components (parts that are individually maintained or operated) were defined, the boundaries were established, the attributes that characterize them were identified as well as the information systems in which each attribute should reside.

In the Information Systems theme, the information systems that support asset management were identified, as well as the existing and future connections between those systems.

Finally, on the Information theme, key performance indicators were identified, both from an efficacy perspective (ensuring quality, quantity and reliability of supply) and from an efficiency perspective (ensuring identical levels of effectiveness with fewer resources, or with the same features, and ensuring higher levels of effectiveness).

Assessment of the eligibility of EPAL for ISO 55001 certification

In 2016, in order to more accurately evaluate EPAL's positioning in relation to what is required by ISO 55001 certification and to improve processes and its alignment with the principles of the

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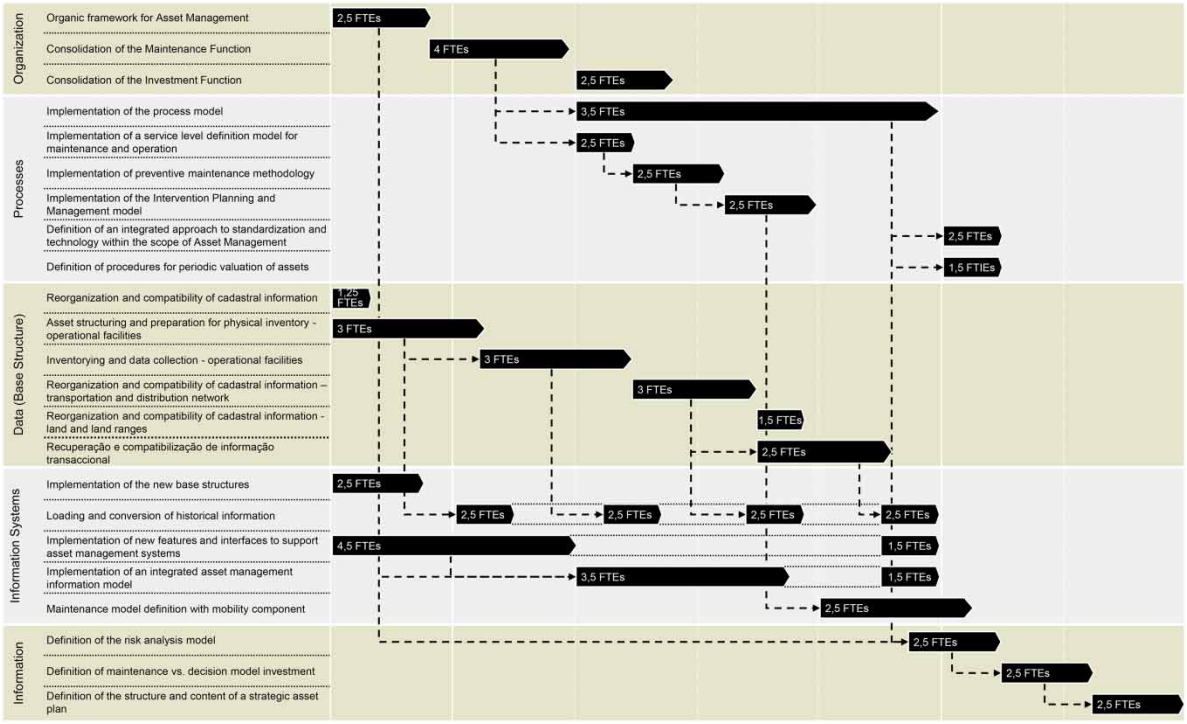

Figure 1 | Roadmap of implementation of EPAL's Integrated Asset Management Model.

standard (ISO 55000 and ISO 55002), EPAL hired an external entity to provide an assessment. This collaboration included one week of analysis of documentation by the consultants (pre-assessment); two weeks of meetings with EPAL's staff, on site and with the Board; a one-day workshop focused on ISO 55001; and one week for integrating all the gathered information and writing the report.

During the diagnostic, several meetings were held with over 25 people from various areas of the company, and various documents related to EPAL's Asset Management activity were made available and analyzed. As a general conclusion, the consultants stated that 'EPAL already has a large number of elements proving eligibility for this certification. (…) The Company has and demonstrates leadership in this project. Its employees strive to ensure that EPAL is effective and competent. The levels of consistency of its processes and still incomplete results are currently within reach. By considering the recommendations made in this evaluation, EPAL may meet the necessary conditions to be audited successfully against the requirements of ISO 55001 in the near future.'. The consultants helped in defining a plan pointing out the necessary actions to fill the identified gaps, in each of the chapters of the ISO55001 standard. These actions were essentially subdivided into three categories: (i) preparation of documents, or 'paper work' – for example, to deliver a document stating the roles and responsibilities of the Asset Management team and its relation with the other Departments of the company; to elaborate the Strategic Asset Management Plan document, describing the current practices of strategic planning at EPAL; and so on; (ii) improvement of practices, or 'capabilities' – for example, to review all the processes so that these become 'risk-based'; to create an interface between the several existing databases (GIS, Maintenance, Financial, …); and so on; and (iii) adapting the corporate management system to accommodate this new certification – for example, to include 'asset management' in the Policy Statement of the company; to understand and register the context of the company and the stakeholders' expectations.

Creation of an 'Asset Management System Committee' and an 'Asset Management System Operational Coordination'

Following the recommendations of the external consultants, two internal teams were created, the 'Asset Management System Committee' (Tactical Level) and the 'Asset Management System

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Operational Coordination' (Operational Level), with the objective of implementing and guaranteeing continuous improvement in the Asset Management System and ensuring the success of the process leading to ISO 55001 certification. With this in mind, the Asset Management System Operational Coordination, which included members from the Construction, Operation, Maintenance, Asset Management and Corporate Sustainability Departments, carried out the implementation of the action plan towards certification. During approximately six months, this team had monthly follow-up meetings with the Asset Management System Committee.

Beyond the certification, the Asset Management System Committee still carries on having these monthly meetings, with the follow main objectives:

- To define and periodically monitor the objectives of the asset management system.
- To ensure the implementation and the revision of the strategic asset management plan.
- To ensure that the Board of Directors (Strategic Level) is informed about:
  - asset management performance
  - objectives and their compliance
  - effectiveness of the asset management system

Likewise, the Asset Management System Coordination Operational Team remains responsible for the definition and effective implementation of the asset management system activities and for promoting improved system performance, namely:

- To ensure compliance with the procedures defined under the Asset Management System, in order to contribute to the policy and to the improvement of the company's performance.
- To identify and propose suggestions for improvement of the Asset Management System, and hence, to the improvement of the company performance.
- To comply with and enforce the applicable Asset Management System rules in the company.

RESULTS AND DISCUSSION

The key challenges regarding the above-mentioned process were associated more with the implementation of integrated asset management at EPAL, rather than with the certification in itself. In fact, the deployment of such a model at EPAL enabled:

- Aligning of the AM function with the other functions in the company (operational and financial).
- Identifying the assets and their respective components, making it clearer whether their replacement would become a capital or an operational expenditure.
- Aligning EPAL's information systems in order to extract information regarding the assets' performance and cost, namely the financial register ERP, the maintenance management system Maximo, the geographical information system Geomedia, the client management system Aquamatrix, the condition assessment information system – and the several Excel spreadsheets where operational information resulting from SCADA was registered.
- The monitoring of cost, performance and risk indicators supporting asset managers in running decision-making models.

Overall, with the implementation and consolidation of the Integrated Asset Management Model, EPAL now has a more integrative and holistic approach towards all operational asset initiatives, which leads the company to achieve greater levels of efficiency and, consequently, higher return on assets.

Notwithstanding, preparing for the certification through the external assessment carried out in 2016 was revealed to be a wise decision. The consideration of the external assessment recommendations required the involvement of a large team within the company, alongside their ongoing

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roles and responsibilities, which was not always easy to reconcile. The portfolio of actions, though, proved to be a very useful tool to guide this team. Great involvement and articulation between the elements of the various departments represented on the 'Asset Management System Committee' and 'Asset Management System Operational Coordination' teams was also required. At this point, we found that some items of the standard were not written in a sufficiently objective way, giving rise to different understandings regarding the extent of the preparation work needed.

Certification by ISO 55001 consolidated the framework that was already a practice at EPAL and proved to be useful in formalizing much of the work developed by the asset management function. Notably, the SAMP constitutes a guiding piece that: (i) enables any newcomer to asset management to understand the role of asset management; (ii) documents the alignment between asset management and top management, namely in terms of the drill-down of objectives, as well between asset management and other functions in the business – financial, customers, operations, maintenance, works, etc.; (iii) sets the goals for asset management and translates them into process objectives.

In Figure 2, we show an example of how the decision on rehabilitation of a water tank in Lisbon is taken, based on the asset management process aligned with the other operational and financial functions of the business.

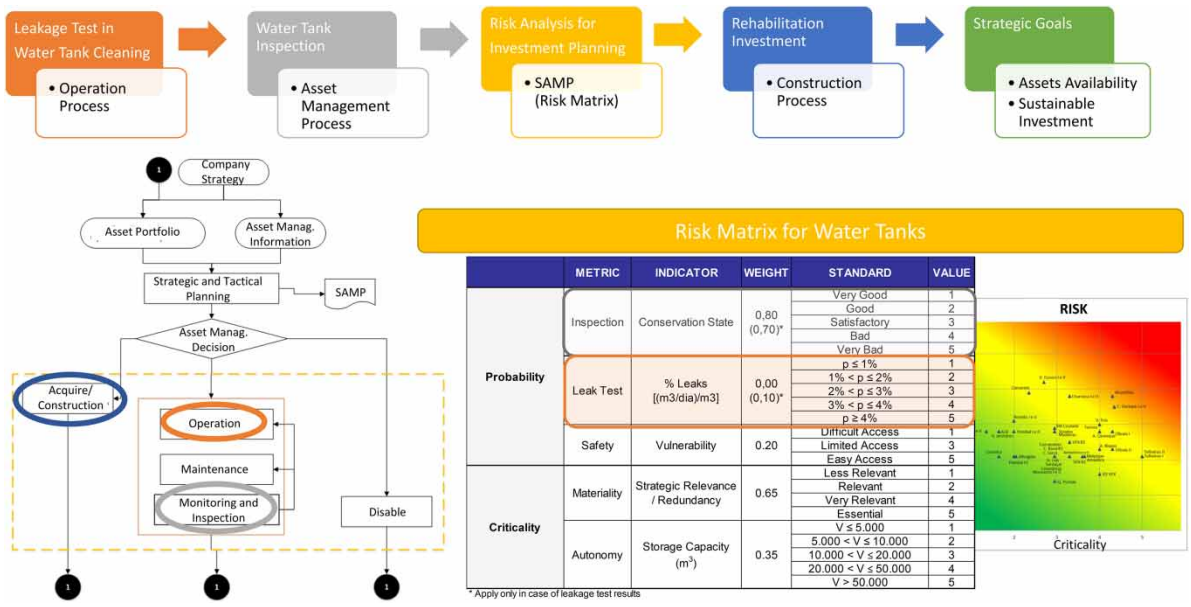

Figure 2 | Example of the rehabilitation decision-making process regarding a water tank in Lisbon.

CONCLUSIONS

The actions that EPAL has been developing and consolidating over the last 10 years in the implementation of the Asset Management System permitted the adoption of a holistic, systemic and systematic approach regarding the assets throughout their useful life, contributing to reliability and resilience of the supply system (Luís *et al.* 2017). Therefore, the certification by ISO 55001 was like 'the cherry on the cake' and not a goal in itself.

Because Asset Management was already an established practice at EPAL, key benefits of the certification are mainly related to the documentation of such practice, which was very incomplete, and to the need of being audited periodically – which challenges current practices in terms of setting new goals and of striving to achieve these, helping to keep the focus. Preparing for the certification also supported the redesign of the Corporate Management System in order to meet the ISO and appendix

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SL requirements, making it more robust and coherent. And, of course, ISO 55001 certification became an asset in terms of image and reputation for EPAL!

It should be noted that none of this would have been possible without the full support that the different Boards of EPAL demonstrated over the last 15 years regarding the implementation of asset management in the company.

We believe that sharing the pathway that led EPAL to obtain the ISO 55001 certification, including the pains and the gains, may be useful to other utilities that aim for this certification too.

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