ISO 50001 Energy Management Case Study:

Singapore Construction Company among the First to be Certified

Improving energy performance, reducing consumption of electricity, improving overall energy efficiency and advancing its knowledge on energy uses might all sound like a tall order for any company.

But these objectives were achieved by a Singapore civil engineering firm which at the same time managed to achieve annual energy cost saving of 26% and gained an internationally accepted energy management certification award in the process.

Figure 1: Core business of HSL Constructor

HSL Constructor Pte Ltd, a family owned and run Singapore-based Construction Company involved in civil engineering, marine structures and mechanical piping works, became one of the first organisations in Singapore to receive ISO 50001 energy management certification.

Route to ISO 50001 certification

First, we need to see what the problem was in the first place.

HSL, with its head office at Gul Lane with a workshop area, outside yard and training facility, also has temporary construction project sites which contain office space, diesel storage facilities and generators, and other types of energy equipment.

In mid-2011, the energy consumption of HSL was rising, and had been since 2009.

Electricity and diesel consumption had escalated unexpectedly indicating that efficiency savings could be made.

In 2011, HSL spent over $100,000 on electricity and over $1m on diesel. With an environmental management certification to maintain and a public corporate social responsibility programme, the organisation chose to take action to cut costs and drive forward its environmental programme.

Figure 2: Energy survey was required

HSL commissioned energy efficiency consultants Energenz to carry out an energy survey of the head office in Gul Lane. Among the recommendations adopted was to establish an ISO 50001 standard energy management system (EnMS) to address the whole scope of the organisation's energy uses.

HSL took advantage of Singapore government's SPRING funding to in turn pay for the consultancy services provided by GreenBizCheck.

GreenBizCheck designed a three-phase programme delivered through a series of workshops, coaching sessions, tools, document templates, and internal audits, all supported by expert advice on energy performance from Energenz.

The programme commenced in late March 2012 and from preparation to certification took seven and a half months.

In November 2012, after undergoing a two stage audit process undertaken by the certifying organization, Lloyd's Register Quality Assurance (LRQA), HSL was awarded the ISO 50001 energy management certification.

Since commencing action to improve energy performance, HSL has seen its electricity consumption at its Gul Lane site fall to within 1% of its 2009 level with an expected 26% annual cost saving in 2012 compared to business as usual projections.

Action required for ISO 50001 certification

To prepare for the ISO 50001 certification project, HSL had to identify an energy management representative, energy management team, and project sponsor at board level.

The new team received training on energy management systems and the ISO 50001 standard.

A further challenge for HSL was identifying how to integrate the EnMS with their existing integrated system for quality, health and safety, and environment. The existing systems manager was therefore a crucial part of the new team.

The first major step in designing the EnMS was to use an assessment process to identify the most significant energy uses which would help to focus the efforts of the team. The process of assessing significance was based upon an analysis of energy data and organisation factors such as the scope for improvement of the energy use.

The resulting set of nine significant energy uses (SEUs) was felt to appropriately reflect the reality of the organisation's energy performance at this time.

Once the SEUs had been identified it was time to set objectives and targets to improve performance. In order to do this, the organisation needed to fully analyse its current energy performance.

This exercise included establishing the current efficiency with which SEUs were functioning, including the factors affecting their energy performance, and establishing energy saving opportunities so that HSL could set challenging yet realistic targets based on an assessment of likely energy savings, efficiency improvements, and process improvements.

Energy Management Action programmes

A lively action planning workshop, as part of the 3 phase programme designed by GreenBizCheck, resulted in the development of a number of Energy Management Action Programmes (EMAPs) designed to achieve the new objectives and targets.

HSL wanted a set of targets that addressed the whole scope of their energy management system. Targets were therefore set to address energy performance, procurement, organisation culture, and the management of the new EnMS.

Targets were backed by robust monitoring and measuring processes and a monitoring and measuring plan and tool were developed. It was difficult at this early stage to identify the exact resources that would be needed to implement the new EMAPs, therefore, the EMAPs contained actions to complete feasibility studies and obtain quotations for improvements which could then guide decision making in the future.

To complete the design of the EnMS, HSL developed a training programme to add to the internal competencies of staff and identified which competencies they would obtain externally. As a result, a number of staff were trained on the use of air compressors and attended local energy conferences.

The team designed a communication programme informed by the results of a staff survey on environmental and energy issues. New policies and operational controls were written to address procurement where it has an ability affect energy performance, such as when renting new diesel equipment, to address energy in design issues, and to manage each of the SEUs.

An energy auditing programme was designed and documents from the existing integrated management system (IMS), such as the document and records control procedures and procedures for addressing non-conformances and providing correction, corrective, and preventive action , were amended to incorporate the new EnMS.

As a result of all this, HSL now better understands where, how, and why it is using diesel and is in a position to compare performance of key items of equipment and performance across project sites. HSL will use this knowledge to enhance their operational controls and identify improvements.

Moving forward beyond certification

HSL also plans to progress its EnMS by working with its suppliers, vendors, and sub contractors to raise awareness of the need to improve energy performance and find mutually beneficial ways to improve it

HSL is currently in the process of building a large new facility, the Penjuru Lane Complex, where they shall relocate in late 2013 and for which they hope to receive a Green Mark Gold rating.

The move to the new Penjuru Complex will pose challenges for re-setting the organisation's baseline and using the building in a way which maximises energy efficiency and achieves the efficiency that the building is designed to achieve.

To learn more about ISO 50001, visit:

http://www.iso.org/iso/home/standards/management-standards/iso50001.htm

http://app.e2singapore.gov.sg/DATA/0/Docs/NewsFiles/Unlocking%20Energy%20Efficiency%20with%20ISO%2050001_v2.pdf

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