IMPLEMENTATION OF ISO 50001 ENERGY MANAGEMENT SYSTEM WITH THE ADVANTAGE OF ARCHIVE VIEWER IN NSRRC

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Abstract

Due to the limited energy resources in Taiwan, energy conservation is always a big issue for everyone who lives in this country. According to the data from the related departments, nearly 98% of energy is imported from abroad for more than a decade. In order to resolve the energy resource shortage and pursue a more efficient energy use, the implementation of ISO 50001 energy management system (EnMS) is activated with the advantage of the Archive Viewer in NSRRC this year. The energy management system will build up an overall energy usage model and a certain number of energy performance indicators to help us achieve efficient energy usage.

Introduction

The Taiwan Green Productivity Foundation has been entrusted to execute the consulting project in deployment of ISO 50001 since 2011. This project has successfully assisted 125 organisations in developing the energy management systems and earned the third-party certifications from 2011 to 2018 in Taiwan. Due to the limited natural resources in Taiwan, the development plan in this country must be sustainable and environment-friendly. It is the main intention to deploy the energy management system to NSRRC. ISO 50001 combines the viewpoint from stockholder and the concept of risk management to operate the PDCA management cycles, which stands for Plan-Do-Check-Action, a repetitive four-stage model for continuous improvements.
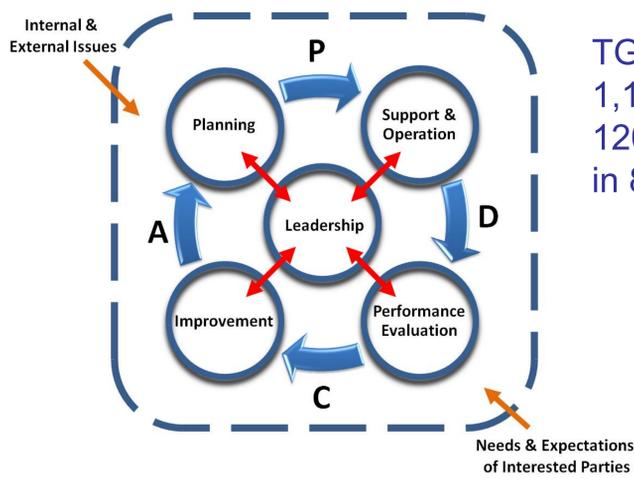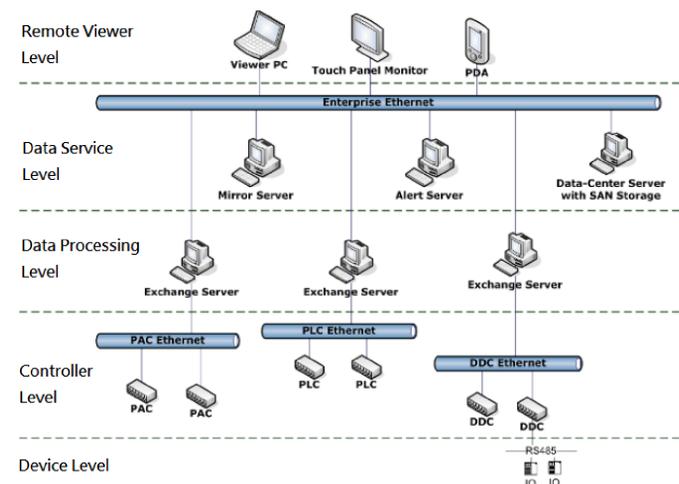

TGPF's achievement:
1,131 treatments
120 GWh electricity
in 8 years

PDCA cycles in ISO 50001:2018 energy management system.
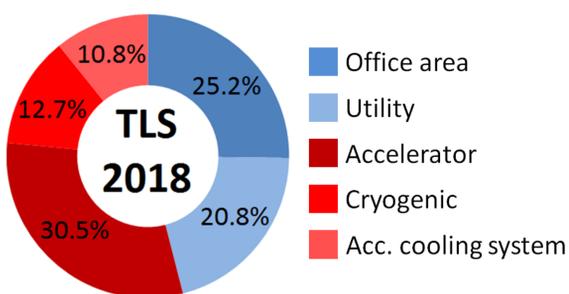
Archive Viewer

The Archive Viewer system in Taiwan Light Source (TLS), a hybrid SCADA systems was proposed by Tsai et al. in 2007 [1]. It collects most of the instrumentation data in TLS, including the vacuum, magnet, RF, utility, cryogenic, power, safety, optic devices and so on. These big data could be extracted and arranged by different purposes and systems to satisfy all kinds of end users. With the aids of the whole area coverage WiFi within NSRRC and the remote desktop apps on smart phones or remote devices, commanding on utility systems becomes very simple and easily accessible. After integrating the LINE Notify, the alarm server could send instantaneous warnings once the readings of the monitoring data exceed the thresholds. The big data base is very helpful to build up the energy tracking model and EnPIs, as well as to establish the long term EnB.

Network architecture of the Archive Viewer system.

5 Actions

Energy profile in TLS 2018

- Office area — 25.2%
- Utility — 20.8%
- Accelerator — 30.5%
- Cryogenic — 12.7%
- Acc. cooling system — 10.8%

Substitution of LED lamps
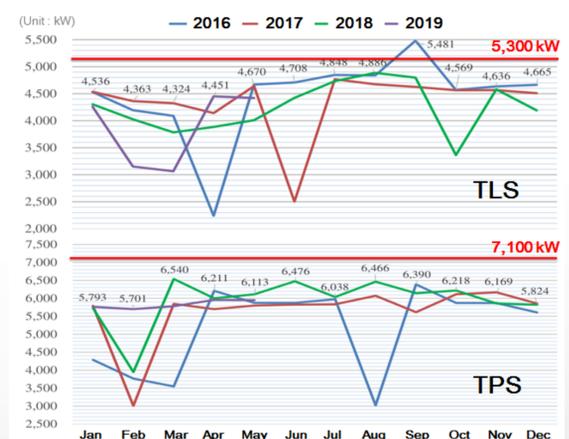
700 USD/M saved

Photovoltaic system in NSRRC

1.15 GWh/yr Generation
600 Ton/yr CO_2 reduction

Adoption of EC fan in AHU

> 25% Power consumption reduced
Noise : 86 dB(A) →73 dB(A)
(under 15,000 cfm flow)

To Rationalize E contract capacity

4k USD/Month saved

Optimization of heat exchanger