

# **ENERGY MANAGEMENT SYSTEM (EnMS)**

## **APEX MANUAL**

**(Based on Requirements of ISO 50001:2018)**

**Document No. : ABC/EnMS/AM**

**Issue No.:01**

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	<b>PREPARED BY</b>	<b>REVIEWED BY</b>	<b>APPROVED BY</b>
<b>DESIGNATION</b>			
<b>DATE</b>	<b>01.12.2022</b>	<b>15.12.2022</b>	<b>01.01.2023</b>
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### **MANUAL DISTRIBUTION**

Master Copy of the Manual duly approved is kept with EnMS Coordinator.

Soft Copy of the Manual in the form of PDF–read only is kept in share folder of ABC for reference.

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### **PROFILE OF COMPANY**

To be added by Company.

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## REFERENCES

ISO 50001:2018	Energy Management Systems – Requirements with guidance for use.
ISO 50006:2014	Energy management systems — Measuring energy performance using energy baselines (EnB) and energy performance indicators (EnPI) — General principles and guidance
ISO 50015:2014	Energy management systems — Measurement and verification of energy performance of organizations — General principles and guidance



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## **TERMS AND DEFINITIONS**

### **1. ORGANISATION**

ABC

### **2. MASTER COPY**

Master copy is the one, which is duly approved and authorized for use. Master copy will be used for generating "CONTROLLED COPY" as required.

### **3. CONTROLLED COPY**

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### **5. OBSOLETE COPY**

Master copy of a document, which are not in use (Old revisions) preserved for legal/ knowledge preservation.

## **Important definitions related to EnMS**

### **Energy management system**

EnMS

Management system to establish an energy policy, objectives, energy targets, action plans and process(es) to achieve the objectives and energy targets

### **Energy performance**

Measurable result(s) related to energy efficiency, energy use and energy consumption.

Note 1 to entry: Energy performance can be measured against the organization's objectives, energy targets and other energy performance requirements.

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Note 2 to entry: Energy performance is one component of the performance of the energy management system.

### **Energy performance indicator**

EnPI

Measure or unit of energy performance, as defined by the organization

Note 1 to entry: EnPI(s) can be expressed by using a simple metric, ratio, or a model, depending on the nature of the activities being measured.

Note 2 to entry: See ISO 50006 for additional information on EnPI(s).

### **Energy baseline**

EnB

Quantitative reference(s) providing a basis for comparison of energy performance

Note 1 to entry: An energy baseline is based on data from a specified period of time and/or conditions, as defined by the organization.

Note 2 to entry: One or more energy baselines are used for determination of energy performance improvement, as a reference before and after, or with and without implementation of energy performance improvement actions.

Note 3 to entry: See ISO 50015 for additional information on measurement and verification of energy performance.

Note 4 to entry: See ISO 50006 for additional information on EnPIs and EnBs.

### **Significant energy use**

SEU

Energy use accounting for substantial energy consumption and/or offering considerable potential for energy performance improvement

Note 1 to entry: Significance criteria are determined by the *organization*,

Note 2 to entry: SEUs can be facilities, systems, processes, or equipment.

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**Interested party (preferred term)**  
**Stakeholder (admitted term)**

Person or organization that can affect, be affected by, or perceive itself to be affected by a decision or activity

Note: In addition, all other terms and definitions published in ISO 50001 are applicable.

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## **4. ORGANIZATION CONTEXT**

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## **UNDERSTANDING THE ORGANIZATION AND ITS CONTEXT**

### **PURPOSE**

To determine external and internal issues those are relevant to ABC

### **SCOPE**

Covers external issues and internal issues that are relevant to ENMS of ABC.

### **SYSTEM**

ABC has determined the external and internal issues that are relevant to its purpose and that affect its ability to achieve the intended outcomes of EnMS and improve energy performance.

The information related to above is maintained with MR and is reviewed in management reviews.

### **REFERENCES**

- ISO 50001:2018 requirement: 4.1
- Process: Risks and opportunities based on external issues, internal issues and needs & expectations of interested parties (ABC/EnMS/PCS/02)
- External issues and internal issues related to EnMS

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## **UNDERSTANDING THE NEEDS AND EXPECTATIONS OF INTERESTED PARTIES**

### **PURPOSE**

To determine interested parties and their needs and expectations.

### **SCOPE**

Covers needs and expectations of interested parties that are relevant to EnMS of ABC.

### **SYSTEM**

ABC has determined:

- a) Interested parties that are relevant to energy performance and EnMS,
- b) Relevant needs and expectations of these interested parties, and
- c) Which of the above needs and expectations ABCS addresses through its EnMS.

Information related to above is maintained with MR and is reviewed in management reviews.

### **REFERENCES**

- ISO 50001:2018 requirement: 4.2
- Process: Risks and opportunities based on external issues, internal issues and needs & expectations of interested parties (ABC/EnMS/PCS/02)
- Interested parties of ABC related to EnMS and their needs and expectations
- Register of EHS Legal and other requirements

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## **DETERMINING THE SCOPE OF THE EHS MANAGEMENT SYSTEM**

### **PURPOSE**

To define the scope of energy management system of ABC.

### **SCOPE**

It is applicable to EnMS based on the requirements of ISO 50001:2018 requirements.

### **SYSTEM**

ABC has established scope of EnMS determining the boundaries and its applicability considering the following:

- a) the external and internal issues as determined under 4.1;
- b) the needs and expectations of interested parties as determined under 4.2;
- c) ABC's authority and ability to exercise control and influence.

Scope of the Energy Management System of ABC covers meeting the requirements of ISO 50001:2018 with respect to its activities related to:

### **Scope of EnMS**

To develop a system for more efficient use of energy.

### **REFERENCES**

ISO 50001:2018 requirement: 4.3

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## **ENERGY MANAGEMENT SYSTEM**

### **PURPOSE**

To address the overall intent of EnMS of ABC.

### **SCOPE**

It is applicable to EnMS of ABC based on requirements of ISO 50001:2018 standards.

### **SYSTEM**

With an aim to continually improve its EnMS, including the processes needed and their interactions, ABC has established and implemented EnMS meeting the requirements of ISO 50001:2018 standard. ABC intends not only to maintain EnMS, but also to continual improvement of its EnMS and energy performance.

### **REFERENCES**

- ISO 50001:2018 requirement: 4.4
- Sequence of interaction of main elements of EnMS (Annexure-4)
- List of EnMS Processes(Annexure-3)



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**5. LEADERSHIP AND WORKER PARTICIPATION**

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## **LEADERSHIP AND COMMITMENT**

### **PURPOSE**

To provide evidence of top management's leadership and commitment for EnMS.

### **SCOPE**

It is applicable to EnMS to meet the requirements of ABC and ISO 50001.

### **SYSTEM**

Top Management commitment and leadership with respect to continual improvement of energy performance and the effectiveness of EnMS is ensured through:

- a. Establishing EnMS boundaries and scope;
- b. Establishing energy policy, objectives and targets that are compatible with the strategic direction of ABC;
- c. Integration of the EnMS requirements into the ABC business processes;
- d. Approval and implementation of action plans;
- e. Ensuring resources needed for the EnMS are available;
- f. communicating the importance of effective energy management and of conforming to the EnMS requirements;
- g. achieving intended outcomes of EnMS;
- h. promoting continual improvement of energy performance and the EnMS;
- i. ensuring the formation of an energy management team;
- j. directing and supporting persons to contribute to the effectiveness of the EnMS and to energy performance improvement;
- k. supporting other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility;

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- l) EnPI(s) appropriately represent(s) energy performance;
- m) Processes are established and implemented to identify and address changes affecting the EnMS and energy performance within the scope and boundary of the EnMS.

## **REFERENCES**

- ISO 50001:2018 requirement: 5.1
- List of EnMS Processes (Annexure-3)

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## **POLICY**

### **PURPOSE**

To define the ABC's Energy Policy

### **SCOPE**

It is applicable to EnMS of ABC.

### **SYSTEM**

Top Management of ABC has established an Energy Policy which is appropriate to the purpose of ABC and it provides a framework for setting and reviewing energy objectives and targets.

Energy Policy includes a commitment:

- a) to ensure the availability of information and necessary resources to achieve objectives and energy targets;
- b) to satisfy applicable legal requirements and other requirements related to energy efficiency, energy use and energy consumption;
- c) to continual improvement of energy performance and the EnMS;

Energy Policy supports the

- a) procurement of energy efficient products and services that impact energy performance, and
- b) design activities that consider energy performance improvement.

To ensure its understanding, Energy Policy is communicated to all concerned personnel within ABC through training, displays and distribution. This Policy is maintained as documented information and is made available to the interested parties also through communication and presenting Policy in ABC website. This Policy is periodically reviewed and updated as necessary.

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Energy Policy of ABC is presented in the next page.

## REFERENCES

ISO 50001:2018 requirement: 5.2

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## **ORGANIZATIONAL ROLES, RESPONSIBILITIES AND AUTHORITIES**

### **PURPOSE**

To define organization structure and responsibility and authority of personnel

### **SCOPE**

This covers defining responsibility and authority of personnel performing activities having effect on EnMS performance.

### **SYSTEM**

Organization chart of ABC is given at Annexure-1. Responsibilities and authorities for relevant roles related to EnMS for various positions are defined by ABC and the same is maintained by Head of HR. These are internally communicated to all concerned through email / ION. Further, responsibility and authority of personnel performing activities having effect on energy performance are defined in the respective documented information, as appropriate. Responsibilities w.r.t. EnMS requirements is given under EnMS Responsibility Matrix (Annexure-2).

MR and energy management team were nominated by ABC and these are assigned with the following responsibility and authority.

- a) ensuring that EnMS is established, implemented and maintained and is continually improved;
- b) ensuring that the EnMS conforms to the requirements of ISO 50001:2018 standard;
- c) implementing actions plans to continually improve energy performance;
- d) reporting on the performance of the EnMS and improvement of energy performance to top management at determined intervals;
- e) Establishing criteria and methods needed to ensure that the operation and control of the EnMS are effective.

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## REFERENCES

ISO 50001:2018 requirement: 5.3  
Roles, responsibilities and authorities relevant to EnMS.

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## 6. PLANNING



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## **ACTIONS TO ADDRESS RISKS AND OPPORTUNITIES**

### **PURPOSE**

To determine risks and opportunities and actions to address the same.

### **SCOPE**

It covers risks and opportunities related to EnMS.

### **SYSTEM**

#### **Actions to address Risks and Opportunities**

When planning for the EnMS, ABC has considered the issues referred to in 4.1, the requirements referred to in 4.2 and the scope of EnMS defined under 4.3.

ABC has determined the risks and opportunities related to its EnMS and these risks and opportunities address the need to:

- a) give assurance that the EnMS can achieve its intended results, including energy performance improvements;
- b) prevent or reduce, undesired effects;
- c) Achieve continual improvement of EnMS and energy performance.

When planning actions to address the above determined risks and opportunities, ABC considers how to:

- 1) integrate and implement the actions into its EnMS and energy performance processes;
- 2) Evaluate the effectiveness of these actions.

### **REFERENCES**

- ISO 50001:2018 requirements 6.1
- EnMS Processes: Process: Risks and opportunities based on external issues, internal issues and needs & expectations of interested parties (ABC/EnMS/PCS/02)

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## **OBJECTIVES, ENERGY TARGETS AND PLANNING TO ACHIEVE THEM**

### **PURPOSE**

To establish objectives, energy targets and plan to achieve the same.

### **SCOPE**

It covers objectives and targets related to EnMS.

### **SYSTEM**

In line with the management's commitment expressed in the organization's Energy Policy, measurable objectives and targets (where practicable) are established at relevant functions, levels and processes needed for EnMS.

The documented information on the objectives and energy targets is retained with the Unit Head.

While establishing objectives and energy targets, the following are taken into consideration / taken into account, as appropriate:

- a) applicable EnMS requirements;
- b) opportunities to improve energy performance;
- c) Significant Energy Uses.

The objectives and energy targets are monitored by Unit Head and are communicated to all concerned personnel within ABC. These are updated by MR / energy management team based on the review outcome by unit Head.

ABC has established and maintains plans to achieve objectives and energy targets, which includes:

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- a) what will be done;
- b) what resources will be required;
- c) who will be responsible;
- d) when it will completed;
- e) how the results will be evaluated, including methods used to verify energy performance improvements.

The actions to achieve its objectives and energy targets are integrated into the business processes of ABC. The documented information on action plans is retained with the concerned Unit Head.

#### **REFERENCES**

- ISO 50001:2018 requirement: 6.2.1 & 6.2.2
- EnMS Processes: Objectives and planning to achieve them (ABC/EnMS/PCS/06)
- Energy objectives and targets
- Energy objectives and targets achievement plan

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## **ENERGY REVIEW**

### **PURPOSE**

To develop and conduct energy review and update the same at periodical intervals.

### **SCOPE**

It is applicable to energy review under scope of EnMS.

### **SYSTEM**

ABC has developed and conducted energy review as given below:

- a) Analyzing energy use and consumption based on measurement and other data, i.e.:
  - 1) Identify current types of energy;
  - 2) evaluate past and current energy use(s) and consumption;
- b) Identifying Significant Energy Use based on the analysis,;
- c) Determining relevant variables and current energy performance of the unit:
  - 3) Identifying the person(s) doing work under its control that influence or affect the unit;
- d) Determining and prioritizing opportunities for improving energy performance;
- e) Estimation of future energy use(s) and energy consumption.

The energy review is reviewed once in a year and updated once in a year, as well as in response to major changes in facilities, equipment, systems or energy-using processes.

ABC has established a process which includes methods and criteria for energy review and retains documented information of its results.

### **REFERENCES**

- ISO 50001:2018 requirement: 6.3
- EnMS Processes: Energy review(ABC/EnMS/PCS/03)

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## **ENERGY PERFORMANCE INDICATORS**

### **PURPOSE**

To determine and update Energy Performance Indicators.

### **SCOPE**

It covers Energy Performance indicators under scope of EnMS.

### **SYSTEM**

ABC has determined EnPIs that:

- a) are appropriate for measuring and monitoring its energy performance;
- b) enable ABC to demonstrate energy performance improvement.

The method for determining and updating the EnPIs defined in a Process: Energy Performance Indicators. EnPI values are reviewed and compared to their respective Energy Base line values, as appropriate and information related to EnPI values are retained.

### **REFERENCES**

- ISO 50001:2018 requirement: 6.4
- ISO 50006:2014
- EnMS Processes: Energy Performance indicators (ABC/EnMS/PCS/04)

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## **ENERGY BASELINE**

### **PURPOSE**

To establish an Energy Baseline (EnB).

### **SCOPE**

Establishing EnB taking account of energy review based on previous 2 years minimum.

### **SYSTEM**

ABC has established an EnB using the information from the energy review for previous two years at least.

Because the energy review data indicates different variables that significantly affect energy performance, ABC has carried out normalization of the EnPI values and corresponding EnB.

The information related to EnB is retained by ABC including relevant variable data and modifications to EnB(s).

### **REFERENCES**

- ISO 50001:2018 requirement: 6.5
- ISO 50006:2014
- EnMS Processes: Energy Baseline (ABC/EnMS/PCS/05)

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## **PLANNING FOR COLLECTION OF ENERGY DATA**

### **PURPOSE**

To define and implement an energy data collection plan.

### **SCOPE**

It covers energy data under scope of EnMS.

### **SYSTEM**

ABC has identified key characteristics of its operations having effect in ISO 50006:2018 affecting energy performance. These are measured, monitored and analyzed at planned intervals and the relevant data is collected and retained.

Data collected and retained as includes:

- a) the relevant variables for unit;
- b) energy consumption related to unit;
- c) operational criteria related to unit;
- d) data specified in action plans.

The energy data collection plan is reviewed at least once in six months and updated as appropriate.

ABC ensures that the equipment used for measurement of key characteristics provides data which are accurate and repeatable and retains documented information on measurement, monitoring.

### **REFERENCES**

- ISO 50001:2018 requirement: 6.6

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# 7. SUPPORT



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## **RESOURCES**

### **PURPOSE**

To determine and provide resources needed for EnMS.

### **SCOPE**

It covers all resources as given under this section for effective EnMS.

### **SYSTEM**

The resources including human resources, infrastructure, facilities etc.needed for the establishment, implementation, maintenance and continual improvement of the EnMS and its continual improvement are determined during annual budget / Management Reviews and are provided accordingly.

### **REFERENCES**

- ISO 50001:2018 requirement: 7.1
- Annual Budget

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## **COMPETENCE**

### **PURPOSE**

To determine competence requirements of personnel.

### **SCOPE**

It covers competence of personnel performing activities that affect energy performance and effectiveness of EnMS.

### **SYSTEM**

Concerned Dept. Head in coordination with Unit Head determines and ensures the competence of personnel under ABC control performing activities that affects energy performance and EnMS. It is ensured by the concerned Dept. Head that these persons are competent on the basis of appropriate education, training or experience.

ABC has a system to identify training needs associated with its significant energy use and EnMS. Based on the training needs, training calendar is prepared and training is provided to ensure acquiring necessary competence. In addition to training, other actions are also taken to acquire necessary competence. These include obtaining necessary competence certification / licenses, visiting other related industries, getting information through internet, etc. Effectiveness of training / any other actions taken are evaluated by suitable means as determined by concerned Dept. Head.

### **REFERENCES**

- ISO 50001:2018 requirement: 7.2
- EnMS Processes: Competence and Awareness (ABC/EnMS/PCS/07)

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## **AWARENESS**

### **PURPOSE**

To ensure that persons working under ABC are aware of the relevant EnMS information.

### **SCOPE**

It covers all personnel working under control of ABC.

### **SYSTEM**

It is ensured through internal training and communication that the persons working under ABC are aware of:

- a) the Energy Policy
- b) their contribution to the effectiveness of EnMS, including achievement of objectives and energy targets and the benefits of improved energy performance;
- c) the impact of their activities or behavior with respect to energy performance;
- d) the implications of not conforming with the requirements of EnMS, incidents and outcomes of investigations that are relevant to them;

### **REFERENCES**

- ISO 50001:2018 requirement: 7.3
- EnMS Processes: Competence and Awareness (ABC/EnMS/PCS/07)

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## **COMMUNICATION**

### **PURPOSE**

To determine the communication relevant to EnMS.

### **SCOPE**

It covers internal and external communication relevant to EnMS.

### **SYSTEM**

ABC has determined the internal and external communications relevant to EnMS, including:

- a. On what ABC will communicate;
- b. When to communicate;
- c. With whom to communicate;
  - internally among the various levels and functions of ABC
  - amongst contractors and visitors to the work place
  - among other interested parties
- d. How to communicate;
- e. Who communicates.

While determining communication requirements, ABC ensures that information communicated is consistent with information generated within the EnMS, and is reliable.

The communication process of ABC addressed that any person(s) doing work under it's control can make comments or suggest improvements to the EnMS and to EnMS performance.

As an evidence of communication, documented information related to communication is retained with concerned Dept. Head/MR.

### **REFERENCES**

- ISO 50001:2018 requirements 7.4
- EnMS Processes: Communication (ABC/EnMS/PCS/08)

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## DOCUMENTED INFORMATION

### PURPOSE

To control the documented information related to EnMS.

### SCOPE

It covers the documented information required by ISO 50001:2018 systems and determined by ABC.

### SYSTEM

#### 7.5.1 General

ABC has determined the documented information required by ISO 50001:2018 and information determined for the effectiveness of EnMS.

Documented information maintained as necessary to support the operation of processes and documented information maintained for the purpose of communicating the information necessary to operate the EnMS is in the form of any or combination in hard or soft copy as given following:

The **documented information is maintained** in the form of any or combination of the following maintained in hard / soft copy.

- a) Energy Policy
- b) Objectives
- c) External Issues and Internal Issues
- d) Needs and expectations of interested parties
- e) Risks and Opportunities
- f) Energy Management System Apex Manual
- g) Energy Management Processes
- h) Energy review
- i) Energy base line
- j) EnPIs

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Documented information of external origin (ISO 50001 standard, OEM Manuals, Acts & Rules, etc., ABC Corporate Standards & Guidelines)

List of documented information maintained related to EnMS is maintained with MR.

The **documented information is retained** in the form of the following records any or combination of the following maintained in hard / soft copy.

- a. Files
- b. Log books
- c. Minutes
- d. Communication records

### 7.5.2 Creating and updating

When creating the documented information mentioned under 7.5.1, it is ensured that these are:

- a) Provided with appropriate identification and description which include title, date, prepared & approved and reference number / code.
- b) Reviewed and approved, whereas necessary, for suitability and adequacy.

The documented information is maintained and retained in English / Hindi language in hard copy (paper) / soft copy, as suitable.

### 7.5.3 Control of documented information

Documented information is controlled to ensure;

- a) It is available and suitable for use, where and when it is needed;
- b) It is adequately protected.

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For control of documented information maintained and retained by ABC, the following are considered, as applicable;

- a) Distribution, access, retrieval and use;
- b) Storage and preservation, including preservation of legibility;
- c) Control of changes (revision/issue);
- d) Retention and disposition.

Documented information of external origin for the planning and operation of the EnMS is determined and controlled by the concerned Dept. Head/MR.

It is ensured by the concerned Dept. Head/ MR that the documented information retained (records) as evidence of conformity are protected from unintended alterations.

## REFERENCES

- ISO 50001:2018 requirement: 7.5.1, 7.5.2, 7.5.3
- EnMS Processes: Control of documented information (ABC/EnMS/PCS/01)

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# **8. OPERATION**



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## **OPERATIONAL PLANNING AND CONTROL**

### **PURPOSE**

To plan operations activities related to EnMS and control the same.

### **SCOPE**

It covers planning of processes related to EnMS for implementation of actions identified under Sections: 6.1 & 6.2.

### **SYSTEM**

ABC has a system to plan, implement and control the processes, related to its units and needed to meet requirements and to implement the actions determined under 6.2, through:

- a) establishing criteria for the processes, including the effective operation and maintenance of facilities, equipment, systems and energy-using processes, where their absence can lead to a significant deviation from intended energy performance;
- b) communicating the criteria to relevant personnel doing work under the control of the organization;
- c) implementing control of the processes in accordance with the criteria, including operating and maintaining facilities, equipment, systems and energy-using processes in accordance with established criteria;
- d) keeping documented information to the extent necessary to have confidence that the processes have been carried out as planned.

ABC controls planned changes and review the consequences of unintended changes, taking actions to mitigate any adverse effects, as necessary as defined under change management process. ABC ensures that outsourced operations or processes related to its units are controlled.

The instruments used for monitoring and measurement shall be calibrated through external agency / internal facility. Such instruments shall be tagged with instrument identification number, date of calibration and due date. The list of Instruments and calibration records shall be maintained by Electrical Department.

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**REFERENCES:**

- ISO 50001:2018 requirements: 8.1
- Management of Change (ABC/EnMS/PCS/10)
- EnMS Processes: Energy Operational Control (ABC/EnMS/PCS/09)

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## **DESIGN**

### **PURPOSE**

To consider energy performance improvement opportunities in the design of new, modified and renovated facilities, equipment and systems.

### **SCOPE**

It covers design under scope of EnMS.

### **SYSTEM**

ABC considers energy performance improvement opportunities and operational control in the design of new, modified and renovated facilities, equipment, systems and energy-using processes that can have a significant impact on its energy performance over the planned or expected operating lifetime.

Where applicable, the results of the energy performance consideration are incorporated into specification, design and procurement activities.

The documented information of the design activities related to energy performance are retained by the concerned Dept.

### **REFERENCES:**

- ISO 50001:2018 requirement: 8.2
- EnMS Process: Energy performance improvement in the design of equipment, facilities, systems and processes (ABC/EnMS/PCS/11)

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## **PROCUREMENT**

### **PURPOSE**

To exercise control over procurement of energy using products, equipment and services.

### **SCOPE**

It covers procurement of energy using products, equipment and services that have, or can have, an impact on Energy Performance of units.

#### **8.3.1 Procurement**

ABC has a system for evaluating energy performance over the planned or expected operating lifetime, when procuring energy using products, equipment and services which are expected to have a significant impact on the organization's energy performance.

When procuring energy using products, equipment and services that have, or can have, an impact on Energy Performance of units, ABC informs vendors that energy performance is one of the evaluation criteria for procurement.

### **CROSS REFERENCES:**

- ISO 50001:2018 requirements: 8.3
- EnMS Process: Procurement of energy using products, equipment and services(ABC/EnMS/PCS/12)

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## 9. PERFORMANCE EVALUATION

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## **MONITORING, MEASUREMENT, ANALYSIS AND PERFORMANCE EVALUATION OF ENERGY PERFORMANCE AND THE EnMS**

### **PURPOSE**

To monitor, measure and analyze the EnMS information for identifying areas requiring actions to be taken.

### **SCOPE**

It is applicable to information related to EnMS

### **SYSTEM**

#### **9.1.1 General**

Extent to which Energy Objectives & targets are achieved shall be evaluated by the concerned department / location at least once in a quarter. Effectiveness of action plans in achieving energy objectives and targets shall also be monitored by the concerned department / location at least once in a quarter. Record of the same shall be maintained in Performance Report against Energy Objectives & targets.

Performance against Energy Performance Indicators (EnPIs) shall be monitored on daily and monthly basis . Record of the same shall be maintained in “ABC Power Consumption”. The electrical energy consumption (in KWH) is measured separately for HT Load, LT Load, Lighting Load and Losses by each of the ABC Locations, on daily basis. The HT power consumption, LT power consumption and Lighting power consumption is consolidated

Evaluation of actual versus Baselines consumption shall be carried out every month by Head. Record of the same shall be maintained in Monthly Operating Report (MOR).

Significant energy uses and other outputs of the energy review shall be monitored, measured and analyzed every month by the concerned department / location. Relevant variables related to significant energy use shall also be evaluated every month by the concerned department.

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An energy measurement plan and its monitoring and measurement equipment is defined and implemented. ABC investigates and responds to significant deviations in energy performance. Record of the same shall be maintained.

The documented information related to the above is retained by the respective Dept. Heads.

### **9.1.2 Evaluation of compliance with legal and other requirements**

#### **Compliance Review Mechanism against Legal Requirements**

Evaluation of compliance against applicable Legal Requirements, related to its energy use and consumption, shall be carried out for the Locations by the respective Unit Heads at least once in a year. All the applicable legal requirements shall be evaluated for compliance. The nonconformance observed, if any, shall be specifically highlighted in the Compliance Status report. The results of compliance evaluation shall be reported to the Head - ABC – Operations and also discussed in Management Review meetings.

#### **Compliance Review Mechanism against other Requirements**

Compliance evaluation against applicable Other Requirements, related to its energy use and consumption, shall be carried out for the Locations by the respective Unit Heads at least once in a year. The non-conformance observed, if any, shall be specifically highlighted in the Compliance Status report. The results of compliance evaluation shall be reported to the Head - ABC – Operations and also discussed in Management Review meetings.

The documented information on the results of the evaluation of compliance with legal and other requirements and any actions taken is retained with the concerned Dept. Head.

### **REFERENCES**

- ISO 50015:2014
- ISO 50001:2018 requirements 9.1
- EnMS Processes: Monitoring, measurement, analysis and evaluation of energy performance and EnMS(ABC/EnMS/PCS/13)

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## **INTERNAL AUDIT**

### **PURPOSE**

To plan and conduct internal audits of EnMS.

### **SCOPE**

It covers internal audit of EnMS of ABC as per scope defined under Section: 4.3.

### **SYSTEM**

Internal audits are conducted at planned intervals to provide information on whether the EnMS:

- a) Conforms to :
  - 1) The organization's own requirements for its EnMS;
  - 2) The requirements of ISO 50001:2018 standards;
- b) Is effectively implemented and maintained.
- c) Compliance status of Legal & Other requirements

An audit program (plan & schedule) is planned based on the importance of the processes concerned, changes affecting the organization, and the results of previous audits. The audit criteria, scope, frequency and methods and other details of conducting Internal Audit are defined in the process or in the documented information retained (internal audit plan, schedule, check list, NCRs).

MR selects auditors and facilitates conduct of audit ensuring objectivity and impartiality of the audit process and also ensured that auditors do not audit their own work.

The person responsible for the area being audited ensures that any necessary correction and corrective actions are taken without undue delay.

MR retains documented information as evidence of implementation of audit program and the audit results.



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The person responsible for the area being audited ensures that any necessary correction and corrective actions are taken without undue delay.

MR retains documented information as evidence of implementation of audit program and the audit results.

## REFERENCES

- ISO 50001:2018 requirements 9.2
- EnMS Processes: Internal Audit (ABC/EnMS/PCS/15)

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## **MANAGEMENT REVIEW**

### **PURPOSE**

To conduct review of EnMS by top management to ensure its continuing suitability, adequacy, effectiveness and alignment with the strategic direction of the organization.

### **SCOPE**

It covers agenda as per management review inputs as defined in 9.3.

### **SYSTEM**

To ensure the continuing suitability, adequacy and effectiveness of EnMS and its alignment with the strategic direction of ABC, management review is conducted at least once in 6 months based on the inputs / agenda given below;

<b>Sl.</b>	<b>Agenda point</b>
1	The status of actions from previous management review;
2	Changes in external and internal issues that are relevant to the EnMS;
3	Changes to Risks and Opportunities
4	The extent to which objectives and targets have been achieved
5	Monitoring and measurement results
6	Nonconformities and corrective actions
7	Audit results
8	results of the evaluation of compliance with legal requirements and other requirements
9	energy performance and energy performance improvement based on monitoring and measurement results including the EnPI(s)
10	Adequacy of resources
11	Changes to EnPIs/ Energy Baseline
12	opportunities for continual improvement, including those for competence

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The outputs of the management review in the form of minutes include decisions and actions related to:

- a) Opportunities to improve energy performance;
- b) The energy policy;
- c) The EnPI(s) or EnB(s);
- d) Objectives, energy targets, action plans or other elements of the EnMS and actions to be taken if they are not achieved;
- e) Opportunities to improve integration with business processes;
- f) The allocation of resources;
- g) The improvement of competence, awareness and communication.

The documented information as an evidence of the results of management reviews is retained in the form of minutes by MR.

## REFERENCES

- ISO 50001:2018 requirements 9.3
- EnMS Processes: Management Review (ABC/EnMS/PCS/16)

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# 10. IMPROVEMENT

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## **NONCONFORMITY AND CORRECTIVE ACTION**

### **PURPOSE**

To take appropriate action in case of occurrence of a nonconformity.

### **SCOPE**

It covers nonconformities related to EnMS.

### **SYSTEM**

In case of occurrence of a nonconformity, ABC takes action to control, correct it and deals with the consequences.

Subsequently, ABC evaluates the need for action to eliminate the cause(s) of the nonconformity, in order that it does not recur or occur elsewhere, by:

- 1) Reviewing and analyzing the nonconformity;
- 2) Determining the causes of the nonconformity;
- 3) Determining the similar nonconformities exists, or could potentially occur;

Based on the above, actions are implemented as needed and the effectiveness of corrections taken, if any, are reviewed by the concerned Dept. Heads.

Based on the above actions, ABC makes changes to its EnMS, if necessary.

Documented information as evidence of 'the nature of the nonconformities and any subsequent actions taken' and results of any corrective action' is retained by the concerned Dept. Heads.

### **REFERENCES**

- ISO 50001:2018 requirements 10.1
- EnMS Processes: Nonconformity and Corrective Action (ABC/EnMS/PCS/14)

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## **CONTINUAL IMPROVEMENT**

### **PURPOSE**

To take actions to improve the identified areas based on the results of analysis for continual improvement.

### **SCOPE**

It covers all areas under scope of implementation of EnMS.

### **SYSTEM**

ABC is committed to continually improve the suitability, adequacy and effectiveness of the EnMS.

Based on the results of analysis and evaluation, and the outputs from management review, ABC determines needs or opportunities, if any, and are considered as inputs for continual improvement.

### **REFERENCES**

- ISO 50001:2018 requirements 10.2

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### Organization chart

To be added by ABC

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### **TITLE: EnMS RESPONSIBILITY MATRIX**

<b>Manual Section</b>	<b>Manual Section Title</b>	<b>Responsible Function</b>
<b>CONTEXT OF THE ORGANIZATION</b>		
4.1	Understanding the organization and its context	Top Management Unit Head
4.2	Understanding the needs and expectations of interested parties	Top Management Unit Head
4.3	Determining the scope of the Energy Management System	Top Management Unit Head EnMS Coordinator
4.4	Energy Management System	Unit Head EnMS Coordinator All Depts.
<b>LEADERSHIP</b>		
5.1	Leadership and commitment	Top Management Unit Head
5.2	Energy Policy	Top Management
5.3	Organizational roles, responsibilities and authority	Top Management Unit Head
<b>PLANNING</b>		
6.1	Actions to address risks and opportunities	Top Management Unit Head
6.2	Objectives, energy targets and planning to achieve them	Top Management Unit Head Dept. Heads
6.3	Energy review	Unit Head Dept. Heads EnMS Coordinator
6.4	Energy performance indicators	Unit Head Dept. Heads EnMS Coordinator
6.5	Energy baseline	Unit Head Dept. Heads EnMS Coordinator
6.6	Planning for collection of energy data	Unit Head Dept. Heads EnMS Coordinator



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Manual Section	Manual Section Title	Responsible Function
<b>SUPPORT</b>		
7.1	Resources	Top Management Unit Head
7.2	Competence	Unit Head Head-HR
7.3	Awareness	Unit Head EnMS Coordinator
7.4	Communication	Unit Head EnMS Coordinator
7.5	Documented information	Unit Head Dept. Heads EnMS Coordinator
<b>OPERATION</b>		
8.1	Operational planning and control	Unit Head Dept. Heads
8.2	Design	Unit Head Dept. Heads
8.3	Procurement	Unit Head Dept. Heads Head-Purchase
<b>PERFORMANCE EVALUATION</b>		
9.1	Monitoring, measurement, analysis and evaluation of energy performance and the EnMS	Unit Head Dept. Heads EnMS Coordinator
9.2	Internal audit	Unit Head EnMS Coordinator
9.3	Management review	Top Management Unit Head
<b>IMPROVEMENT</b>		
10.1	Nonconformity and Corrective Action	Unit Head Dept. Heads
10.2	Continual Improvement	Unit Head Dept. Heads

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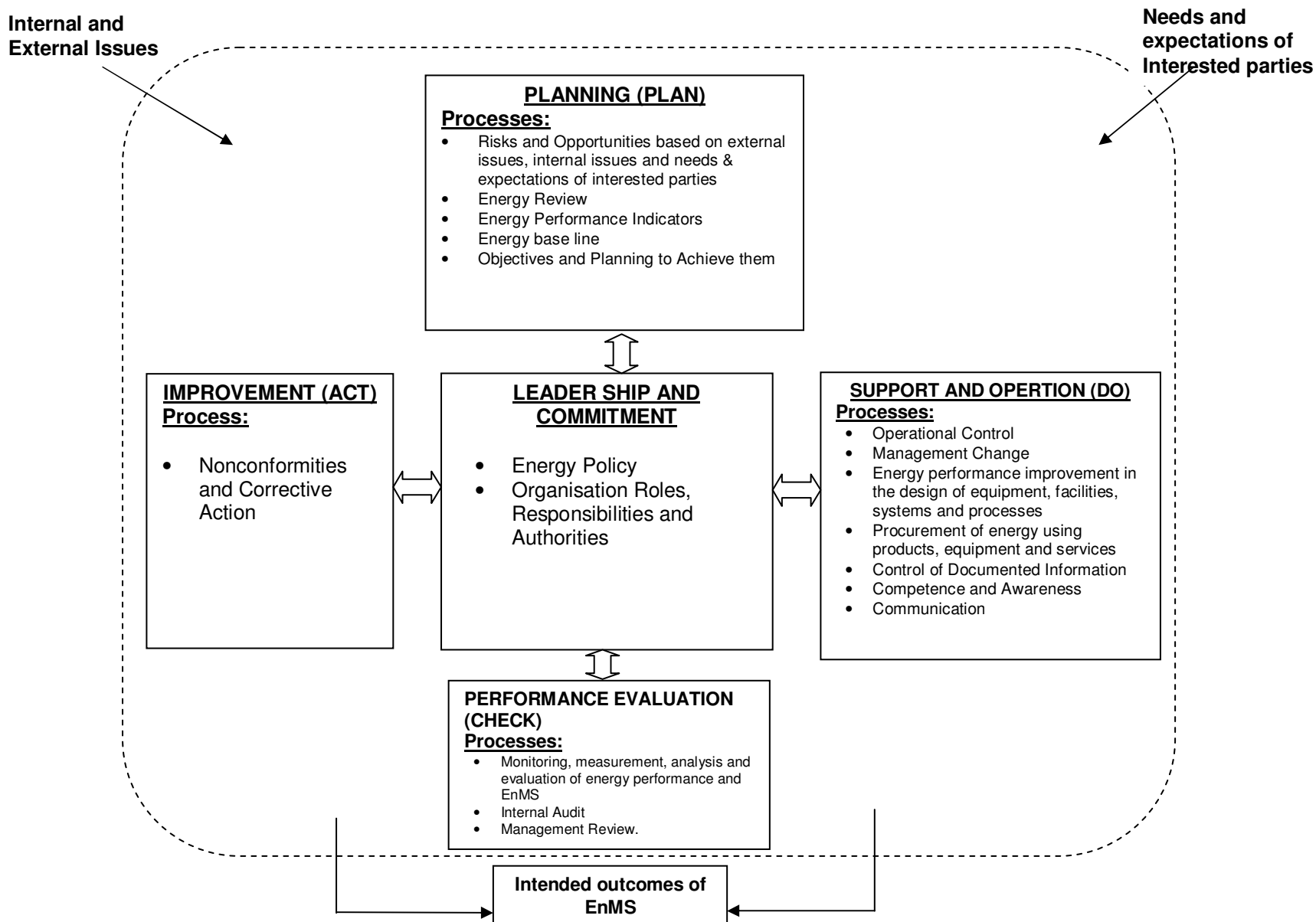
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### **LIST OF EnMS Processes**

<b>Sl. No.</b>	<b>Process Title</b>	<b>Process Code</b>	<b>Relevant ISO 50001 Clause (s)</b>
1	Control of Documented Information	ABC/EnMS/PCS/01	7.5.2, 7.5.3
2	Risks and opportunities based on external issues, internal issues and needs & expectations of interested parties	ABC/EnMS/PCS/02	4.1, 4.2, 6.1.1
3	Energy Review	ABC/EnMS/PCS/03	6.3
4	Energy performance indicators	ABC/EnMS/PCS/04	6.4
5	Energy baseline	ABC/EnMS/PCS/05	6.5
6	Objectives and Planning to achieve them	ABC/EnMS/PCS/06	6.2
7	Competence and Awareness	ABC/EnMS/PCS/07	7.2, 7.3
8	Communication	ABC/EnMS/PCS/08	7.4
9	Energy Operational control	ABC/EnMS/PCS/09	8.1
10	Management of change	ABC/EnMS/PCS/10	8.1
11	Energy performance improvement in the design of equipment, facilities, systems and processes	ABC/EnMS/PCS/11	8.2
12	Procurement of energy using products, equipment and services	ABC/EnMS/PCS/12	8.3
13	Monitoring, measurement, analysis and evaluation of energy performance and EnMS	ABC/EnMS/PCS/13	9.1
14	Nonconformities and Corrective Action	ABC/EnMS/PCS/14	10.2
15	Internal Audit	ABC/EnMS/PCS/15	9.2
16	Management Review	ABC/EnMS/PCS/16	9.3

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### SEQUENCE OF INTERACTION OF MAIN ELEMENTS OF EnMS



Carbon Foot Print. Highlights of energy performance achievement during the period are as under: x Energy cost reduced by 20 % x Reduction in thermal energy by 24 % and electrical energy by 10% x More than 60% of total energy use is from renewable sources (Electrical is > 90%) x Helped us in strengthening monitoring systems x Increased energy efficiency awareness among employees at all levels x Improves the ability of organizations to manage energy risks concerning possible impacts in an efficient and effective way. Other benefits x Plant process scrap / wastage