

	ABC LTD
	ENERGY MANAGEMENT SYSTEM PROCESS MANUAL

Energy Management System

Process Manual

(Based on Requirements of ISO 50001:2018 Standards)

Document No. : ABC/EnMS/PCM

Issue No. : 01

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	PREPARED BY	REVIEWED BY	APPROVED BY
DESIGNATION			
DATE	01.12.2022	15.12.2022	01.01.2023
SIGNATURE			

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MANUAL REVISION SUMMARY

Section No.	Previous Rev. No. & Effective Date	Current Rev. No. & Effective Date	Brief Description of Changes

	PREPARED BY	REVIEWED BY	APPROVED BY
DESIGNATION			
DATE	01.12.2022	15.12.2021	01.01.2023
SIGNATURE			

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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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LIST OF PROCESSES

Sl. No.	Process Title	Process Code	Revision No. / Effective Date	Relevant ISO 50001 Clause (s)
1	Control of Documented Information	ABC/EnMS/PCS/01	00/01.07.2021	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	00/01.07.2021	4.1, 4.2, 6.1.1
3	Energy review	ABC/EnMS/PCS/03	00/01.07.2021	6.3
4	Energy performance indicators	ABC/EnMS/PCS/04	00/01.07.2021	6.4
5	Energy baseline	ABC/EnMS/PCS/05	00/01.07.2021	6.5
6	Objectives and Planning to achieve them	ABC/EnMS/PCS/06	00/01.07.2021	6.2
7	Competence and Awareness	ABC/EnMS/PCS/07	00/01.07.2021	7.2, 7.3
8	Communication	ABC/EnMS/PCS/08	00/01.07.2021	7.4
9	Operational planning and control	ABC/EnMS/PCS/09	00/01.07.2021	8.1
10	Management of change	ABC/EnMS/PCS/10	00/01.07.2021	8.1
11	Energy performance improvement in the design of equipment, facilities, systems and processes	ABC/EnMS/PCS/11	00/01.07.2021	8.2
12	Procurement of energy using products, equipment and services	ABC/EnMS/PCS/12	00/01.07.2021	8.3
13	Monitoring, measurement, analysis and evaluation of energy performance and EnMS	ABC/EnMS/PCS/13	00/01.07.2021	9.1
14	Nonconformities and Corrective Action	ABC/EnMS/PCS/14	00/01.07.2021	10.2
15	Internal audit	ABC/EnMS/PCS/15	00/01.07.2021	9.2
16	Management review	ABC/EnMS/PCS/16	00/01.07.2021	9.3

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**PROCESS TITLE: CONTROL OF DOCUMENTED INFORMATION
(ABC/EnMS/PCS/01)**

1. OBJECTIVE

To control documented information maintained and retained by ABC.

2. BOUNDARY

It covers control of documented information related to EnMS.

3. PROCESS OWNER

Location Head
Dept. Heads
EnMS Coordinator

4. REFERENCES

ISO 50001 requirement: 7.5.1, 7.5.2, 7.5.3

5. RECORDS

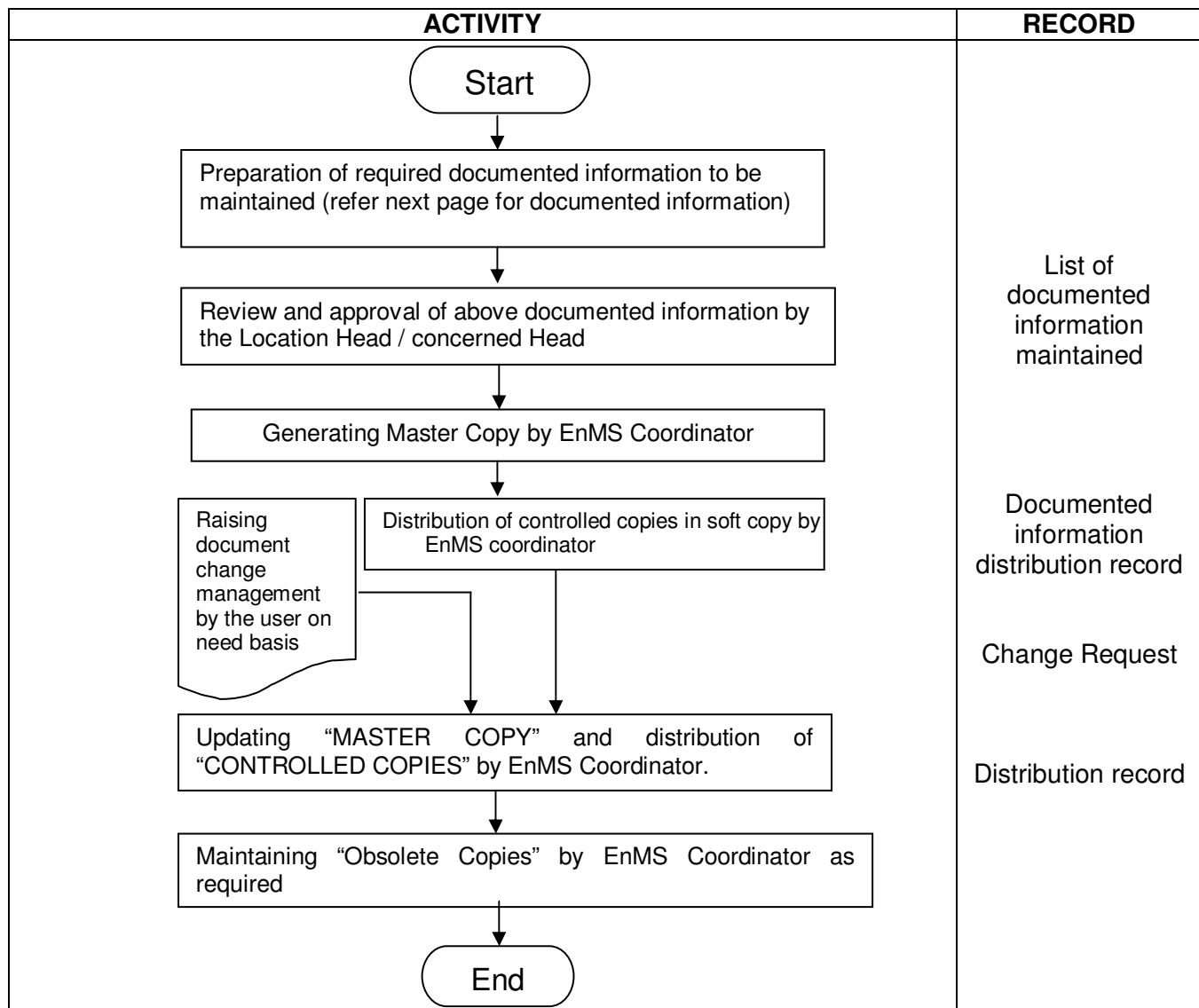
- List of documented Information maintained
- List of documented information retained (records)
- List of documented information maintained (External origin)
- Documented information distribution record

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6. PROCESS FLOW SHEET

Control of Documented Information maintained



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Control of Documented Information retained (RECORDS)

ACTIVITY	RECORD
<p>START</p> <p>Determining the documented information to be retained (records) as per EnMS standard requirements & ABC requirements</p> <p>Capturing the above in the form of list of records with the information related to identification, responsibility and retention period</p> <p>Retaining above determined documented information by the respective department</p> <p>END</p>	<p>List of documented information retained (records)</p> <p>Records as per above list</p>

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Guidelines for Control of Documented Information

1. DOCUMENTED INFORMATION

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

- a) Energy Policy
- b) Energy Objectives
- c) External Issues and Internal Issues
- d) Needs and expectations of interested parties
- e) Risks and Opportunities based on c & d
- f) EnMS Apex Manual
- g) EnMS Processes
- h) Operational Control Procedures
- i) Energy review
- j) Energy base line
- k) EnPIs
- l) Energy use register / SEUs
- m) Documented information of external origin (ISO standards, OEM Manuals, Acts & Rules, etc.)

Note: In addition to above, the any dept. may maintain additional documented information, as required, for effective implementation and maintaining EnMS.

2. DEFINITIONS

MASTER COPY

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

CONTROLLED COPY

A copy of a document, which is updated whenever the Master Copy is changed and is distributed as per the distribution list, is termed "CONTROLLED COPY".

UNCONTROLLED COPY

Any copy of a document, which is generated on 'want basis, shall be referred to as "UNCONTROLLED COPY". This is also generated from Master Copy.

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OBSOLETE COPY

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

In addition to above, terms and definitions given under Section: 3 of EnMS Apex Manual and published in ISO 50001:2018 are applicable.

3. APPROVAL OF DOCUMENTED INFORMATION

Documented information common to all Functions and management function are reviewed and approved by Location Head/EnMS Coordinator.

Documented information specific to the Dept. are reviewed and approved by the concerned HOD / EnMs Coordinator.

4. DOCUMENTED INFORMATION CODING

The EnMS documented information is coded uniquely as per the list maintained with EnMS coordinator / Dept. Head.

5. REVISION NUMBER & ISSUE NUMBER

In case of modification of a document / form, the revision number would be next numeric number.

E.g.: Rev.: 00 indicates no revision
Rev.: 01 indicates first revision
Rev.: 02 indicate second revision and so on.

If the number of revisions are more than twenty or as decided by EnMS Coordinator, the document is / are issued with next Issue Number. (Issue 01: First Issue, Issue 02: second issue etc)

The revision status of the document is set to **Rev.00** in case of issue of document with new Issue Number.

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6. DISTRIBUTION OF CONTROLLED COPIES – HARD COPY:

- 6.1 Master copy (hard copy) of documents is generated by printing the documents and by obtaining approval of the same
- 6.2 Master copy of documents is stamped in violet on the rear side of all pages of documents as “MASTER COPY”.
- 6.3 Controlled and uncontrolled copies are generated by photocopying ‘Master Copy’.
- 6.4 Controlled copies of EnMS documents are distributed according to the distribution list duly stamped in red as “CONTROLLED COPY” on the right hand top of all sheets.
- 6.5 As per the distribution list, the controlled copies of the documents are sent to the recipients. The record of the same is maintained in a distribution record (EnMS/REC/04).
- 6.6 Uncontrolled copies of the documents are issued by EnMS Coordinator on request duly approved by LOCATION HEAD. Uncontrolled copy is also generated from computer and stamped as UNCONTROLLED COPY in green and sent to the recipients. This copy of the document does not warrant updation.
- 6.7 Previous revisions of Controlled Copies are destroyed and those of Master Copy are maintained with EnMS Coordinator and stamped as OBSOLETE.
- 6.8 Master list of documented information is maintained by EnMS Coordinator in a format EnMS/REC/01.

7. DISTRIBUTION OF CONTROLLED COPIES – SOFT COPY:

- 7.1 Master Copy of Soft Copy version is kept in the computer of EnMS Coordinator under safe custody through pass word protection.
- 7.2 Controlled copy - Read only– PDF Version is created by EnMS Coordinator from the above Master Copy and kept the intranet of ABC for reference to the Dept. Heads and other authorized personnel.
- 7.3 EnMS Coordinator is responsible for updating the above controlled copy based on the changes to the Master Copy.

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8. DOCUMENT REVISION / MODIFICATION:

8.1 Any modification / revision to an existing document can be sought by the user due to:

- a) change in technology, system or personnel
- b) change required on audit findings
- c) change in organizational setup
- d) change arising out of corrective action
- e) change in acceptability standards
- f) changes to the compliance obligations.

8.2 Any user seeking a change to documented information intimates EnMS Coordinator through EnMS documented information change request (EnMS/REC/05) duly approved by the concerned authority.

8.3 The EnMS Coordinator incorporates the changes(s) and distributes amendments to all controlled copy holders.

8.4 The revised documents replace earlier revision and old revision documents are destroyed by the controlled copy holder.

8.5 Record of changes to documents is maintained in Revision Record Sheet kept on top of documents.

9. RETENTION OF ORIGINAL DOCUMENT

All outdated Master copy EnMS documents, where complete revision have taken place are stamped "OBSOLETE" in Blue color and retained by EnMS Coordinator till next revision.

10. CONTROL OF DOCUMENTED INFORMATION MAINTAINED-EXTERNAL ORIGIN

10.1 Documented information of external origin such as national standards, international standards, statutory documents, corporate documents, etc. as necessary for the planning and operation of the quality management system, are identified by the respective HODs/EnMS Coordinator. List of the same is maintained by respective HODs/ EnMS Coordinator in EnMS/REC/03 and controlled accordingly.

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10.2 List of documents of external origin is maintained by the concerned HOD/EnMS Coordinator and updates these documents based on the information subscribed based on the following:

- a. Information received from legal authorities
- b. Information received from book houses
- c. Information available on websites
- d. Information received from other related industries

11. CONTROL OF DOCUMENTED INFORMATION RETAINED (RECORDS)

11.1 Records are maintained in the form of Format / Register in the form of Hard Copy / Soft Copy.

11.2 Standard Formats are used for maintaining most of the records and these are controlled by the concerned HOD / In-charge / EnMS Coordinator.

11.3 All records are identified by unique identification number and list of the same is available with the HOD / In-charge concerned (EnMS/REC/02).

11.4 All records are legibly prepared and stored in such a way that they are readily retrievable.

11.5 All records are stored in a suitable environment, to prevent from damage, deterioration and loss. Record holders are responsible for the upkeep and protection of records under their control.

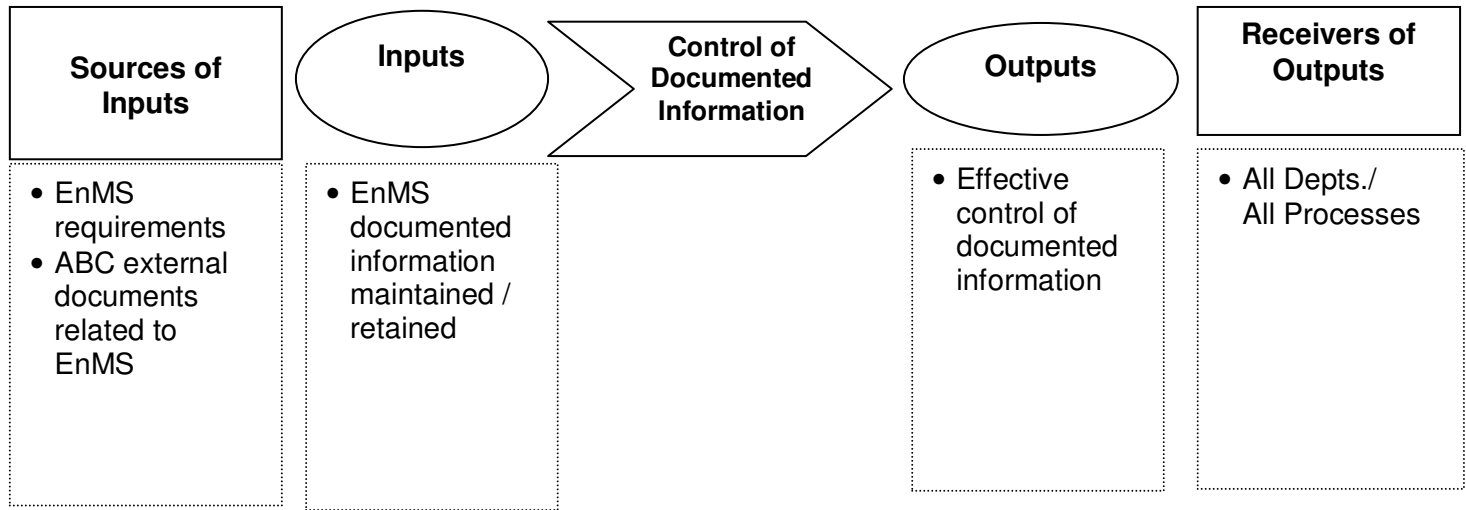
11.6 The retention time of all records is mentioned in the index. After the retention period is over, the concerned record holder seeks approval of HOD for disposal of the records.

11.7 Records are normally destroyed through manual / machine shredding.

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7. PROCESS MAP



8. PERFORMANCE INDICATORS

- Number of non-conformities related to control of documented information

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**PROCESS TITLE: RISKS AND OPPORTUNITIES BASED ON EXTERNAL ISSUES,
INTERNAL ISSUES AND NEEDS & ESPECTATIONS OF INTERESTED PARTIES
(ABC/EnMS/PCS/02)**

1. OBJECTIVE

To determine :

- a) External issues and internal issues
- b) Needs and expectations of interested parties
- c) Risks and opportunities related to EnMS and plan action to address them.

2. BOUNDARY

It Covers EnMS of ABC as per scope of ISO 50001 certification.

3. PROCESS OWNER

Top Management
Location Head

4. REFERENCES

- ISO 50001 Requirement: 4.1, 4.2, 6.1.1

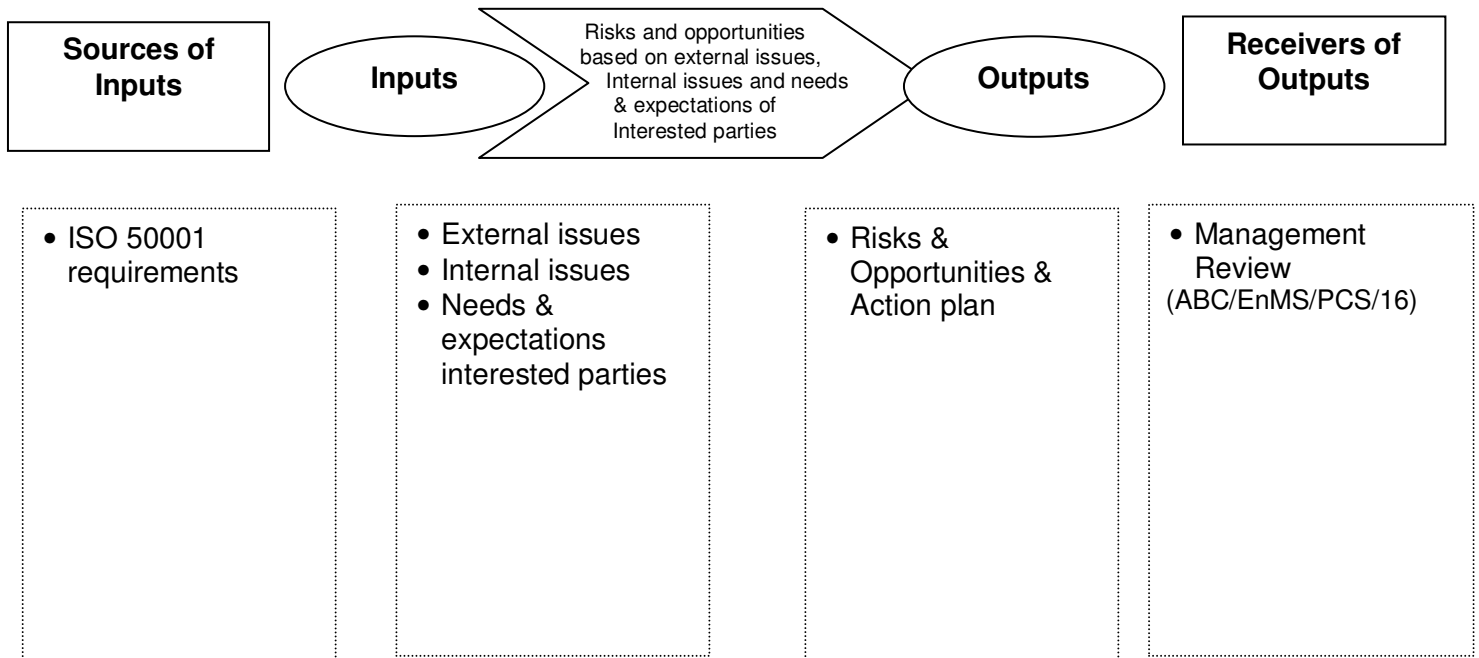
5. RECORDS

- Controls for risk mitigation
- Actions related to Risks & Opportunities

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7. PROCESS MAP



8. PERFORMANCE INDICATORS

- Objectives Achievements Status.

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PROCESS TITLE: ENERGY REVIEW (ABC/EnMS/PCS/03)

1. OBJECTIVE

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

2. BOUNDARY

This is applicable to energy review under scope of EnMS of ABC.

3. PROCESS OWNER

Location Head
Dept. Heads
EnMS coordinator

4. REFERENCES

- ISO 50001: 2018 Requirement: 6.3

5. RECORDS

- Energy Review Record
- List of energy uses and Significant energy uses

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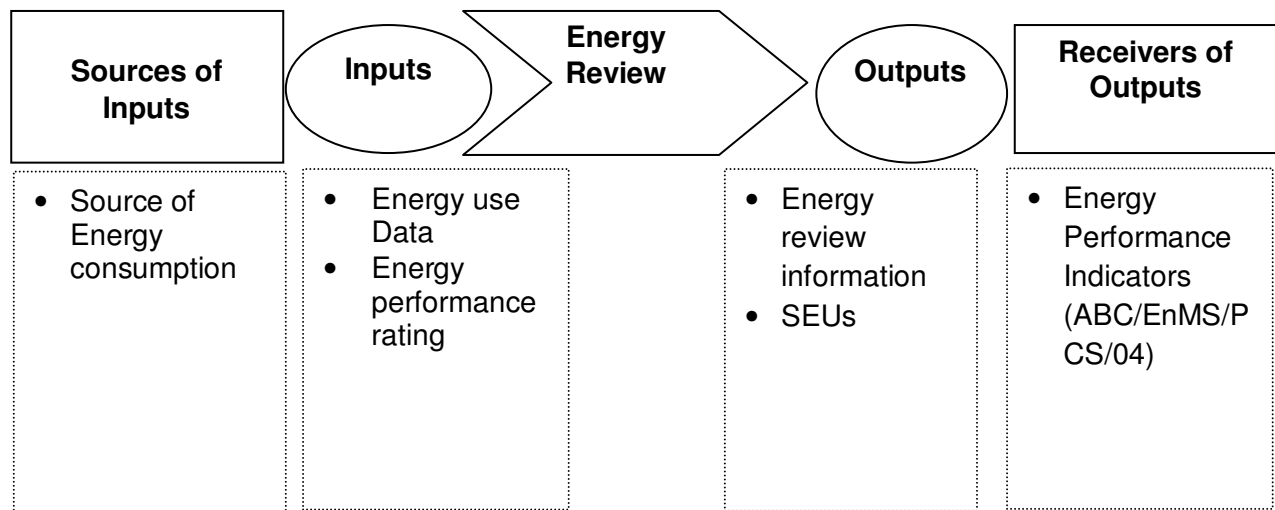
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ACTIVITY	RECORD
<pre> graph TD A((A)) --> B[Identifying areas for improvement addressing SEUs and drawing action plan for the same and/or establishing Operational Control measures (OCP / Check list).] B --> C[Reevaluation of energy usage based on the following: a) Whenever there is any change in energy usage pattern. b) Whenever new equipment, raw materials and services are introduced. c) There is a change in line, layout, design of the building etc. d) New products are introduced. e) At least once in a year.] C --> END([END]) </pre>	Records related to Operational Controls

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7. PROCESS MAP



8. PERFORMANCE INDICATORS

- a) Adherence to energy review frequency

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Guidelines for Energy Review

1. Definitions:

- a) Energy Use: manner or kind of application of energy.
- b) Significant Energy Use: Energy use accounting for substantial energy consumption and/or offering considerable potential for energy performance improvement.

2. Identification of Energy uses (equipment/ processes).

- i) Section in-charges are primarily responsible to identify the activities performed, services offered, equipment and products utilized in their area of jurisdiction.
- ii) Section in-charges shall take into account the following while identifying the equipment/ processes consuming energy:-
 - Equipment requiring electrical energy/ fuels /renewable energy (solar, wind etc.,) for operation,
 - Fuel used for Generator sets (Diesel, Bio-diesel etc,)
 - Changes or proposed changes in the shed layout, activities, or materials,
 - Modifications to the Energy Management System, including temporary changes, and their impacts on operations, processes, and activities,
 - Any applicable legal obligations relating to Energy Management System and implementation of necessary controls,
- iii) The activities / processes / products which are having energy use are listed out by the section in-charges pertaining to their sections in the format _____.

3. Evaluation and Determination of Significant Energy Use

- i) The process/equipment identified are evaluated for:
 - Frequency of Use (D),
 - Energy Intensity (E),
 - No. of similar processes (N) and
 - Potential for Energy Savings (S)

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- ii) Criteria and Rating for assessment and scoring of the identified equipment/process have been categorized as below:

Rating	Frequency of Use:	Energy Intensity	No. of similar Machine/Process	Potential for Energy Savings
1	Infrequent Use (<1Hr/day)	Low Intensity (< 20 Kw)	One	Less Potential (1%-2%)
2	Moderate Use (2 – 4Hr/day)	Moderate Intensity (20 – 50 Kw)	2 – 5	Moderate Potential (3%-5%)
3	High Use (4 - 8Hr/day)	High Intensity (50 – 100 Kw)	6 – 10	Potential (6%-10%)
4	Frequent Use (More than 8Hr/day)	Very High Intensity (> 100 Kw)	More than 10	Significant Potential (>10%)

- iii) All identified energy uses are evaluated in terms of "Energy Score". Rating for all criteria as applicable to particular equipment/ process is assessed by the concerned DC and recorded in Energy Use Register. The product of DxNxSxE is the Energy Score.
- iv) Energy Uses having score equal/more than **12****.are considered as significant Energy Uses (**DxExNxS_E≥12: Significant**).
- v) Significant Energy Uses are focused for energy conservation/efficiency improvements by implementing the OCP & EnMAP.
4. Energy uses are evaluated by the concerned section in-charge to identify the significant energy uses as per format _____.
5. After identifying the SEU it will be recorded in the format _____ i.e, List of SEU.
- 6The variables affecting the energy performance for each identified SEU shall be recorded in the _____
- 7.Person(s) under its control who can influence or affect the SEUs to be documented.

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7. The criteria for deviation of energy consumption for SEU shall be identified and documented in the _____.
8. Review of energy uses is to be carried out once in a year or whenever implementation of new planned / modified processes, introduction of new process/ activity, by Section In-charges on consultation with their controlling officers.

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PROCESS TITLE: ENERGY PERFORMANCE INDICATORS (ABC/EnMS/PCS/04)

1. OBJECTIVE

To determine and update Energy Performance Indicators.

2. BOUNDARY

This covers Energy Performance indicators under scope of EnMS

3. PROCESS OWNER

Location Head
Dept. Head
EnMS coordinator

4. REFERENCES

- ISO 50001 Requirement: 6.4

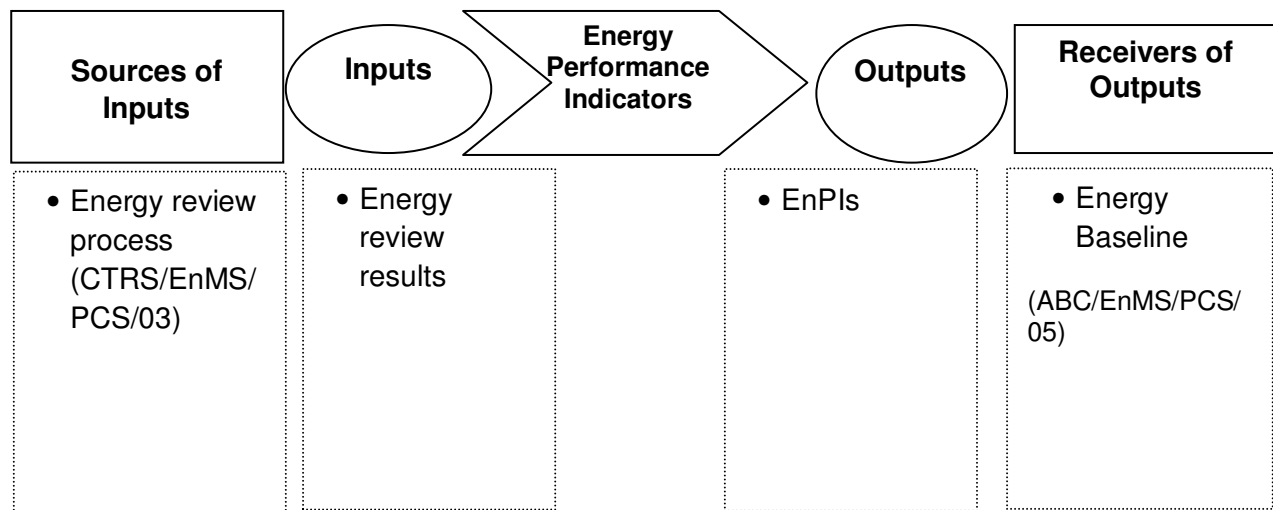
5. RECORDS

- EnPIs data

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7. PROCESS MAP



8. PERFORMANCE INDICATORS

EnPIs targets achievement

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Guidelines for EnPIs

EnPIs provide relevant energy performance information to enable various groups within an organization to understand its energy performance and to take actions to improve it.

The following are the Energy Performance Indicators (EnPI) currently identified forABC

$$\text{EnPI}_{\text{forElectricity}} = \frac{\text{TotalElectricityconsumed}}{\text{Out-turn}} : \text{EnPI}_{\text{Elect.}} = \text{KWh/unit out-turn}$$

- 1) For offices - Power consumption per month (kWh)/ month
- 2) For Data centres PUE(Power Usage Effectiveness)
- 3) For Buildings-Power consumption/sq. m of office area.

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PROCESS TITLE: ENERGY BASELINE (ABC/EnMS/PCS/05)

1. OBJECTIVE

To establish an Energy Baseline (EnB).

2. BOUNDARY

Establishing EnB taking account of energy review based on previous 1 year minimum

3. PROCESS OWNER

Dept. Head
EnMS coordinator

4. REFERENCES

- ISO 50001 Requirement: 6.5

5. RECORDS

- Daily energy meter readings
- HSD Oil issued/Units generated by DG sets
- Monthly Energy consumption
- List of Energy Base lines

While determining the Energy baselines the requirements of Cl 6.5 of ISO50001:2018 to be taken into account.

- i) Where the organization has data indicating relevant variables significantly affect
The organization has to carryout normalization of ENPI values and corresponding ENBs
- ii) ENPIs shall be revised in case of one of more of the following
 - a) ENPIs no longer reflect the organization's energy performance
 - b) There have been major changes to the static factors.
 - c) According to predetermined method.

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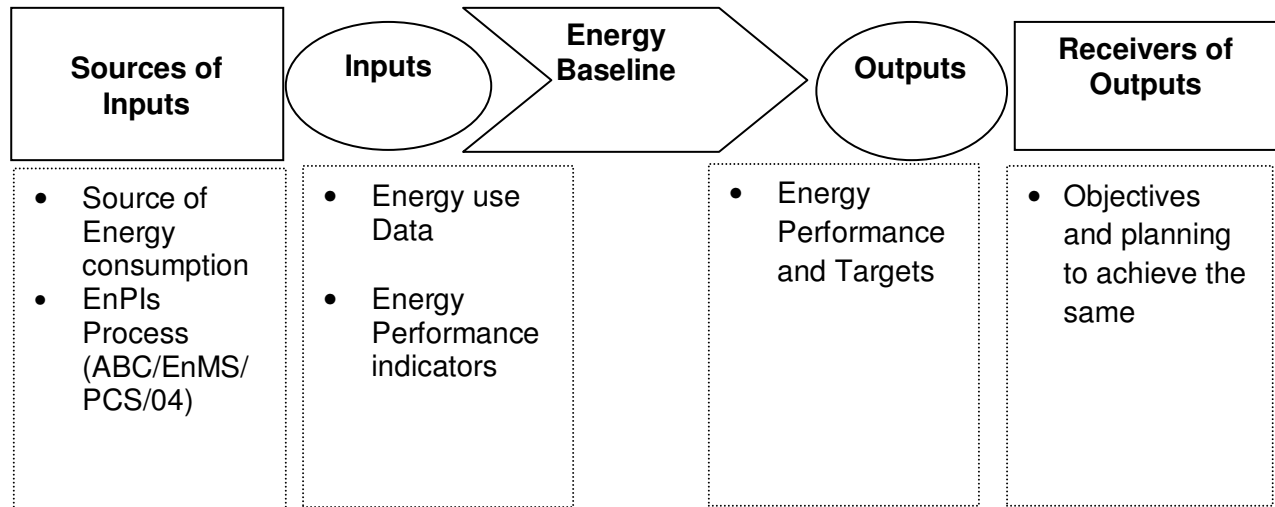
6. PROCESS FLOW SHEET

ACTIVITY	RECORD
<p>START</p> <p>↓</p> <p>Identify different energy sources, and Energy Consumption data</p> <p>↓</p> <p>Calculate energy performance indicators of previous year and define energy baseline</p> <p>↓</p> <p>Define base line energy for all sections in terms of Energy performance indicators (refer guidelines given under pages : 4 & 5)</p> <p>↓</p> <p>Assign Targets for current year base line</p> <p>↓</p> <p>Monitoring of Energy Performance indicators monthly basis</p> <p>↓</p> <p>END</p>	<p>Energy Use Register</p> <p>Energy Review Record</p> <p>Energy measurement, Monitoring and Analysis Record</p>

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7. PROCESS MAP



8. PERFORMANCE INDICATORS

- a) Timeline of setting base line target after completion of Financial Year.

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Guidelines for Energy Baseline

1. General:

Base lining is the act of measuring energy use and energy intensity at a determined level of detail for the purpose of establishing a benchmark for future comparison to itself.

A straight forward six-step process for establishing an Energy Baseline is

- a) Define the boundaries.
- b) Identify the energy sources and measure the consumption.
- c) Define the baseline period.
- d) Define relevant variables.
- e) Determine and calculate energy performance indicators.
- f) Adjustments of baseline and establish the EnB.

Using these steps, energy management staff will determine the suitable EnB from which to monitor and manage improved performance.

The energy team should proceed with a simpler approach to initiate the energy management process and then later enhance metering, calculations, or other areas as the team gains experience, organizational credibility, or other skills.

Establishing an EnB requires a series of activities that fit within an organization's EnMS. This includes an energy management planning process of analyzing past activity and data and a description of future efforts and goals. It also includes assembling a collaborative team to provide input on energy consumption, energy uses, relevant variables, and one-time events that occurred in the past or that are anticipated to occur in coming months or years. These activities and the outputs are typically part of an energy management plan.

2. All operational activities and facilities that required for Data centre Activities are taken into consideration for establishing Energy Baselines.
3. The various Energy sources pertaining to activities of Data Centre considered for the Energy Baseline calculation are identified as under:
 - a) Electrical Energy (in KW-Hr)
 - b) High Speed Diesel Oil (in Litres)

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- 4 Energy consumption mostly depends on the number of servers, AC units in service Seasonal ambient temp which keep varying. Therefore energy base lines are established by considering the average of **three years** data to ensure that energy consumption variation on account of the varying Server Load, seasonal ambient temperature, Floor Space Occupancy etcis normalized.
5. Energy baselines established are enclosed as Annexure –XXX
- 6 Review of the base line(s) is done when there is change in Asset population, / operational controls/ energy systems.
- 7 Review of processes and activities will also be conducted once in 12 months if energy consumption is more than 10% of baseline of the concerned year

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**PROCESS TITLE: OBJECTIVES AND PLANNING TO ACHIEVE THEM
(ABC/EnMS/PCS/06)**

1. OBJECTIVE

To establish energy objectives and planning to achieve the same.

2. BOUNDARY

It covers establishing energy objectives at relevant functions and levels of ABC.

3. PROCESS OWNER

Top Management
Location Head
Dept. Head

4. REFERENCES

- ISO 50001 Requirement: 6.2

5. RECORDS

- Objectives achievement status
- Objectives achievement plan

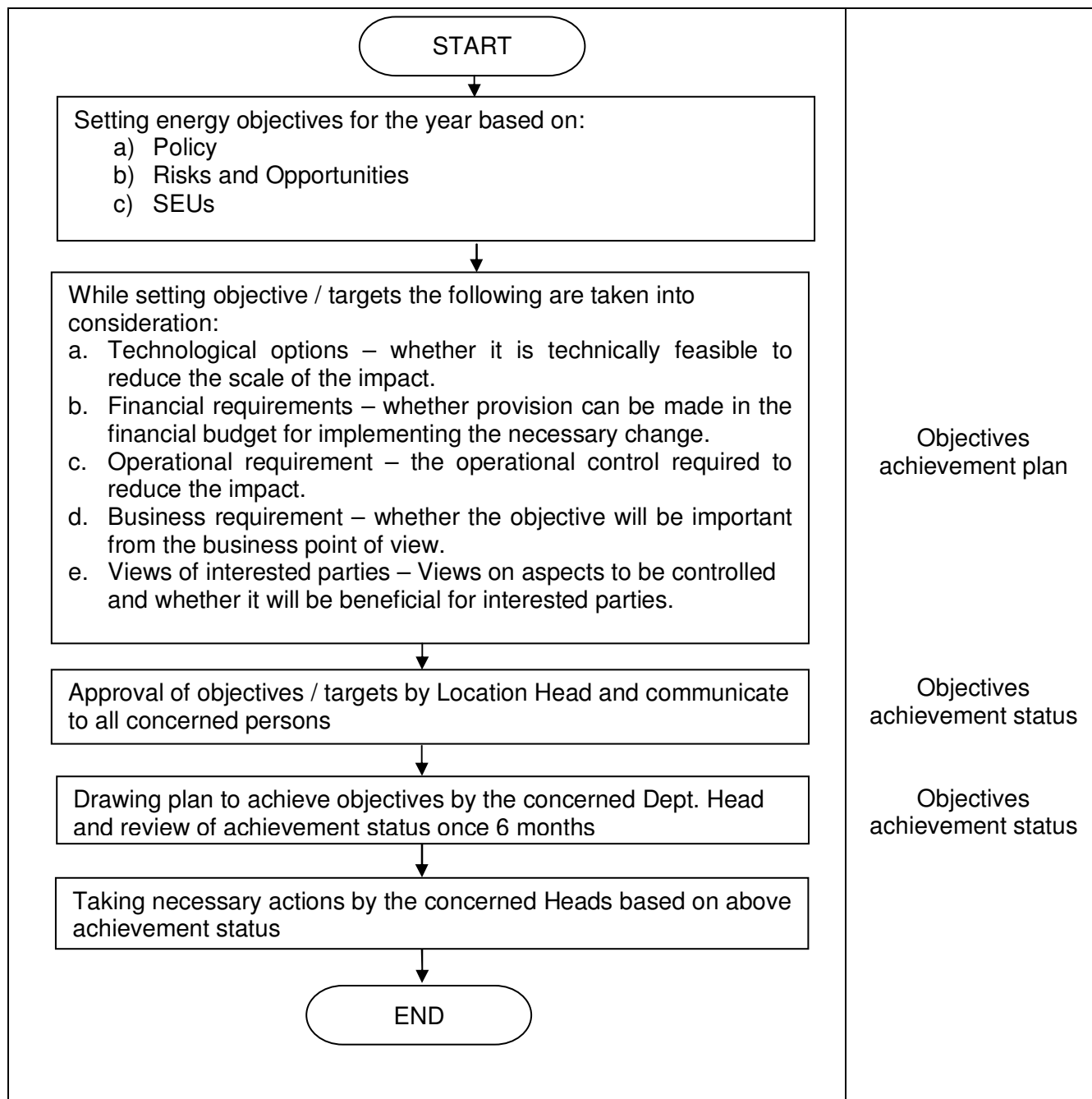
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6. PROCESS FLOW SHEET

ACTIVITY	RECORD
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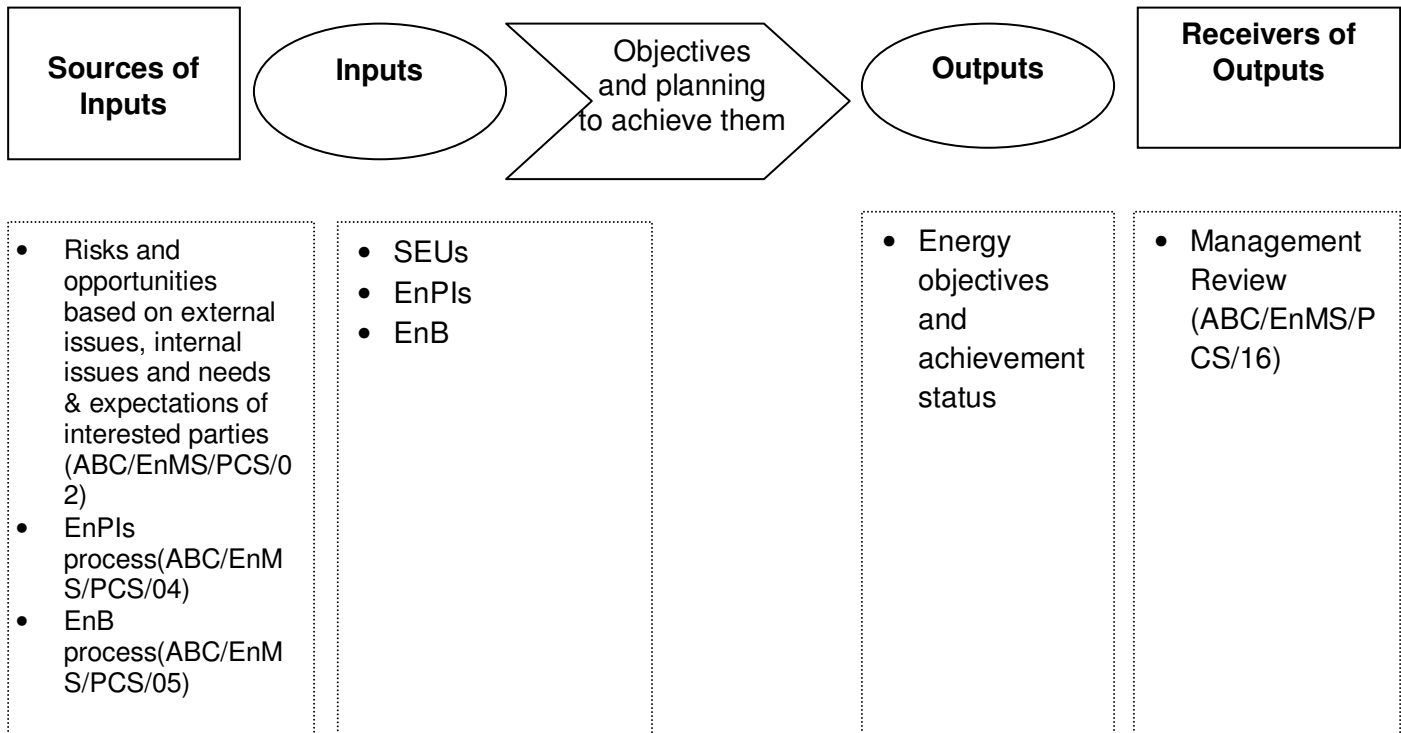
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7. PROCESS MAP



8. PERFORMANCE INDICATORS

- Energy objectives achievement

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PROCESS TITLE: COMPETENCE AND AWARENESS (ABC/EnMS/PCS/07)

1. OBJECTIVE

To ensure the competence of personnel carrying activities affecting EnMS performance.

2. BOUNDARY

Determination of competence requirements to ensuring the fulfillment of required competence for all persons, including contractor personnel.

3. PROCESS OWNER

Location Head
Head-HR
EnMS coordinator

4. REFERENCES

- ISO 50001 Requirement: 7.2, 7.3

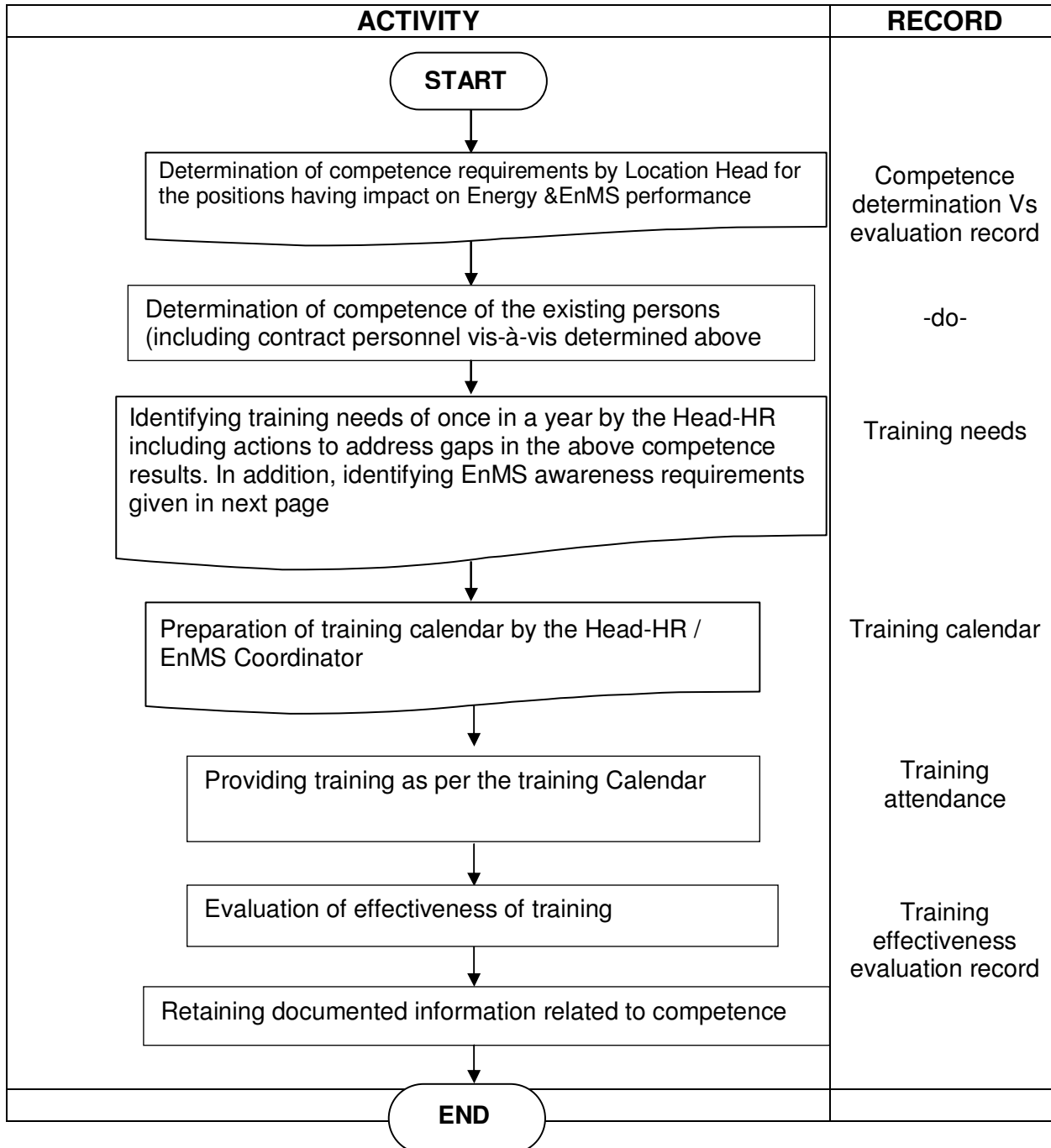
5. RECORDS

- Competence determination and evaluation record
- Training needs identification
- Training calendar
- Training imparting and evaluation record

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6. PROCESS FLOW SHEET



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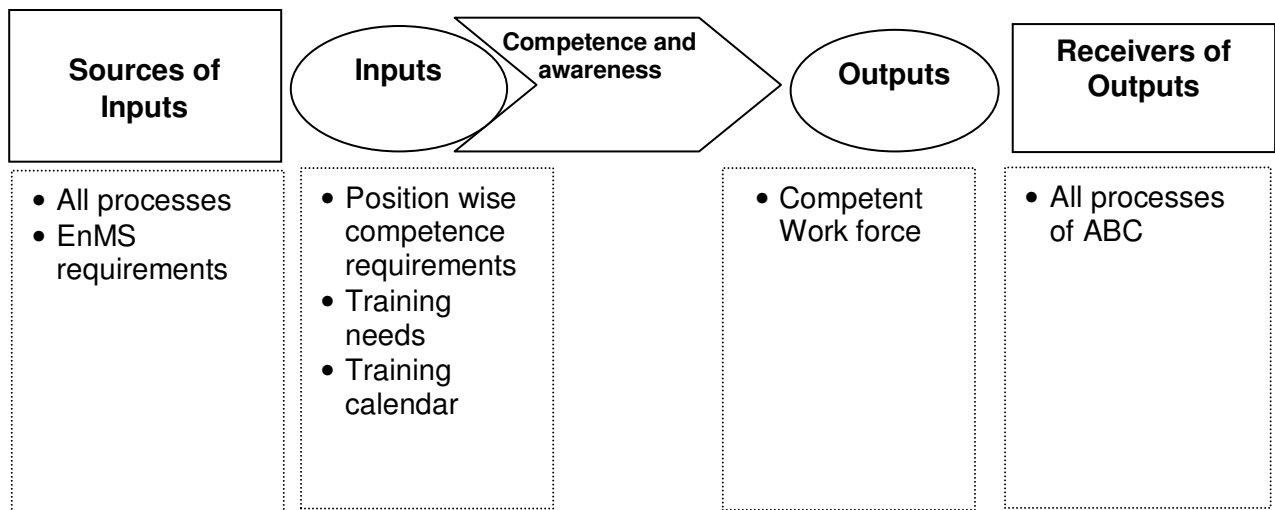
EnMS Awareness Requirements

- a) the Energy Policy
- b) contribution to the effectiveness of EnMS, including achievement of objectives and energy targets and the benefits of improved performance;
- c) the impact of persons' activities or behavior with respect to energy performance;
- d) the implications of not conforming with the requirements of EnMS, including not fulfilling the relevant compliance obligations;

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7. PROCESS MAP



8. Performance Indicators:

- Training man hours / person /year

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PROCESS TITLE: COMMUNICATION (ABC/EnMS/PCS/08)

1. OBJECTIVE

To communicate information related to EnMS effectively.

2. BOUNDARY

It covers internal and external communication on matters related to EnMS.

3. PROCESS OWNER

Location Head
EnMS Coordinator

4. REFERENCES

ISO 50001 Requirement: 7.4

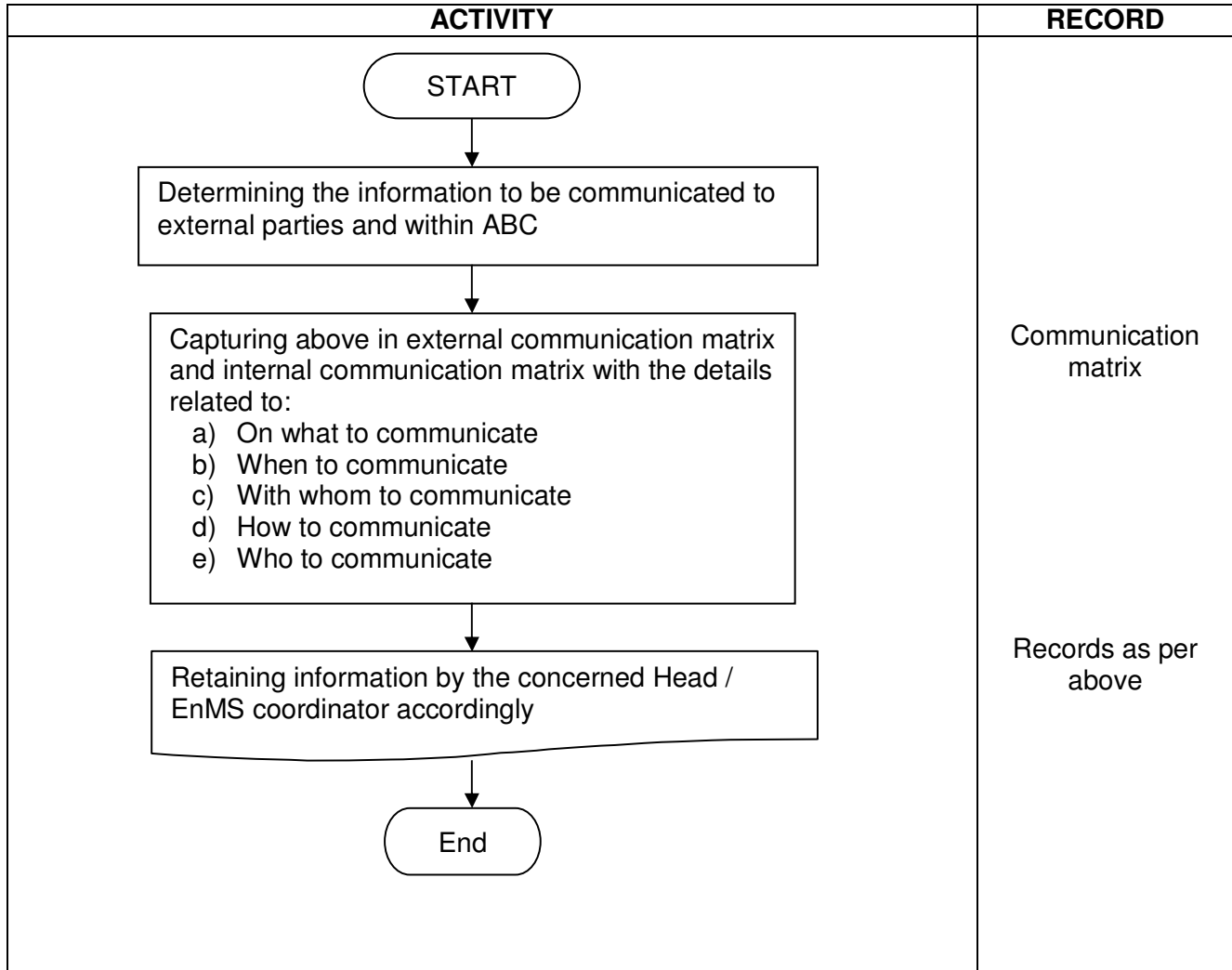
5. RECORDS

Documented information retained (records) as per communication matrix.

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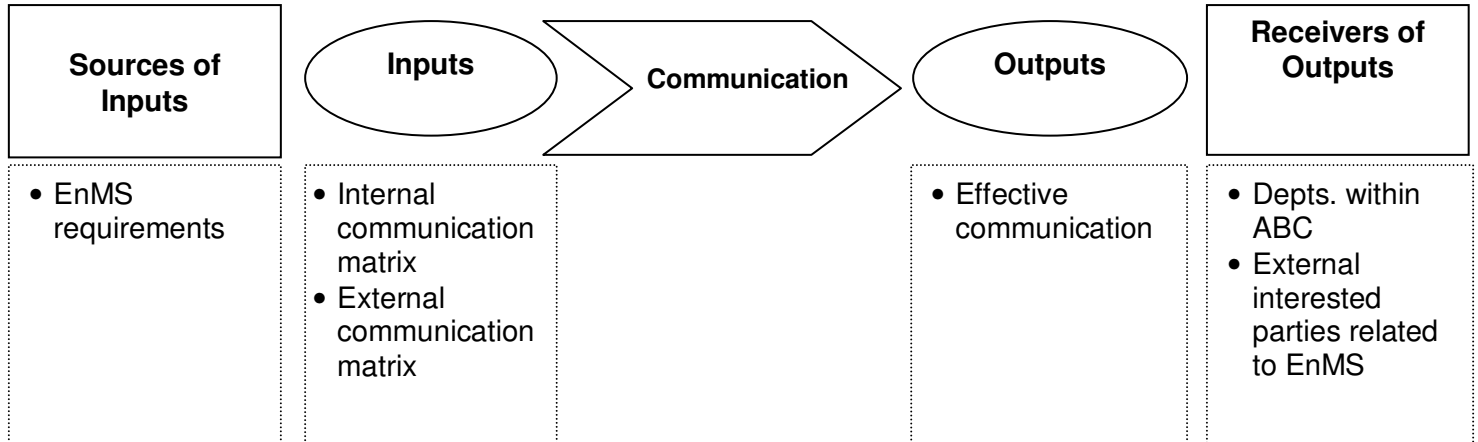
6. PROCESS FLOW SHEET



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7. PROCESS MAP



8. PERFORMANCE INDICATORS

- Deviation to communication matrix

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PROCESS TITLE: OPERATIONAL PLANNING AND CONTROL (ABC/EnMS/PCS/09)

1. OBJECTIVE

To plan and control the processes having impact on energy performance and EnMS.

2. BOUNDARY

Covers processes related to SEUs and energy objectives.

3. PROCESS OWNER

Location Head
Dept. Heads

4. REFERENCES

- ISO 50001:2018 Requirement: 8.1

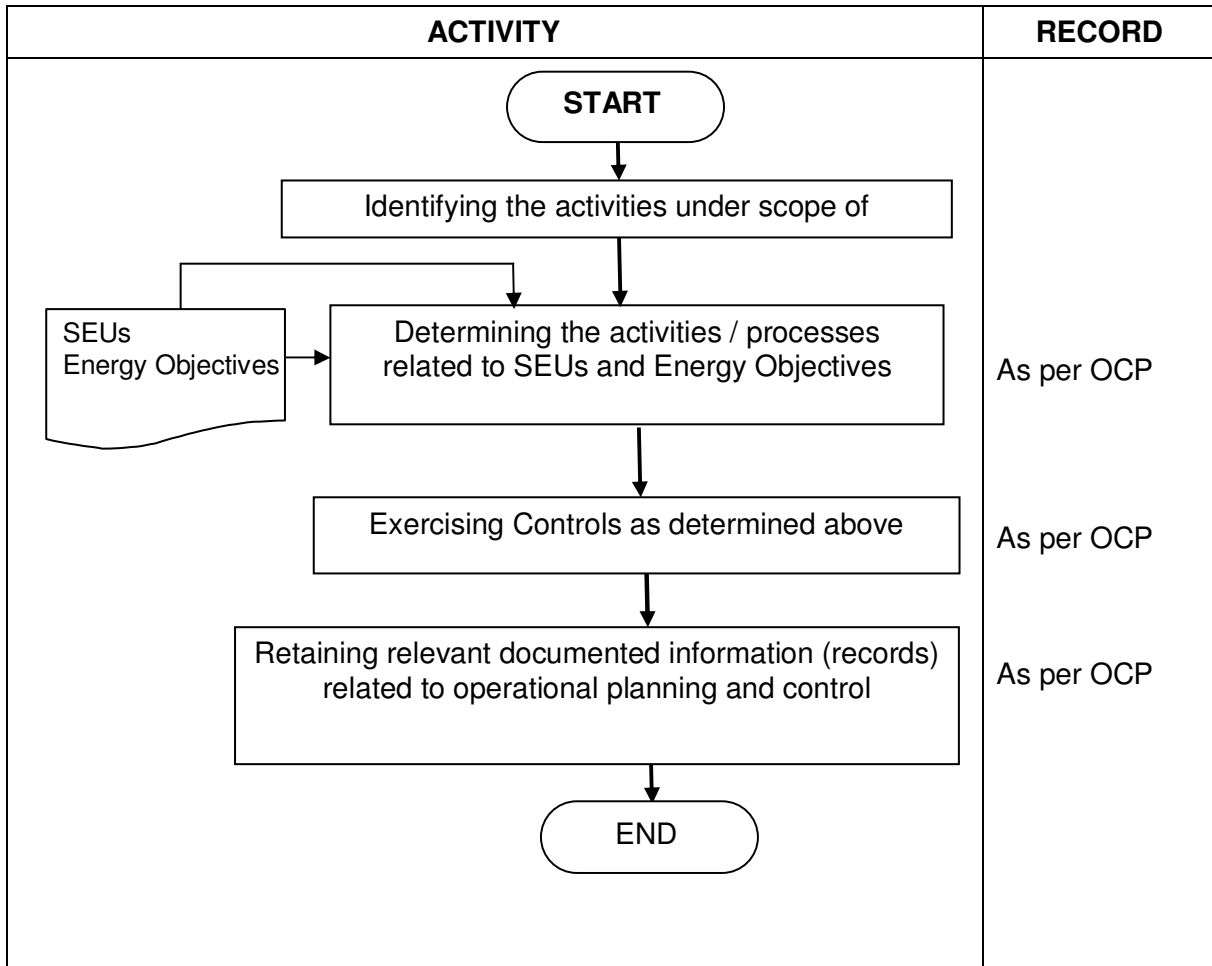
5. RECORDS

- As referred in OCPs

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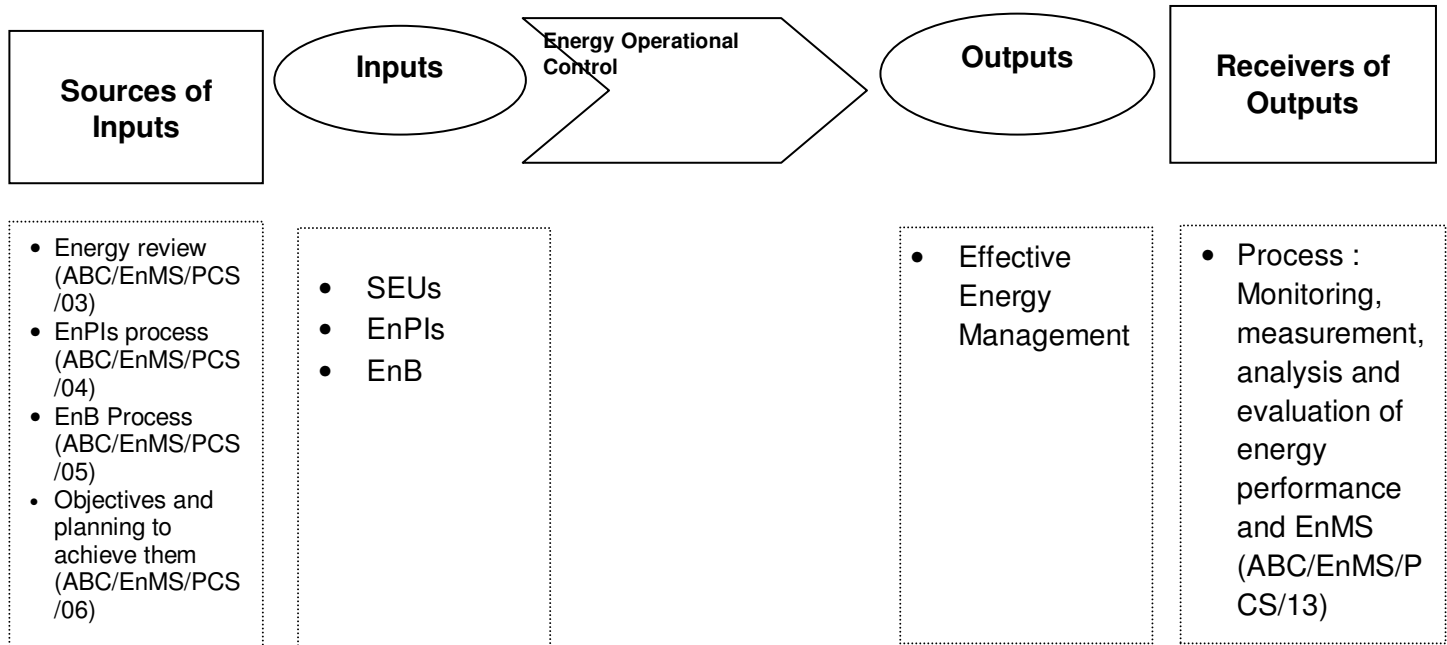
6. PROCESS MAP:



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7. PROCESS MAP



8. PERFORMANCE INDICATOR

No. of incidents of failure of operational controls

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PROCESS TITLE: MANAGEMENT OF CHANGE (ABC/EnMS/PCS/10)

1. OBJECTIVE

To manage changes to EnMS ensuring its integrity.

2. BOUNDARY

From receipt of change request to changes to EnMS.

3. PROCESS OWNER

Location Head
Dept. Heads

4. REFERENCES

- ISO 50001:2018 Requirement: 8.1

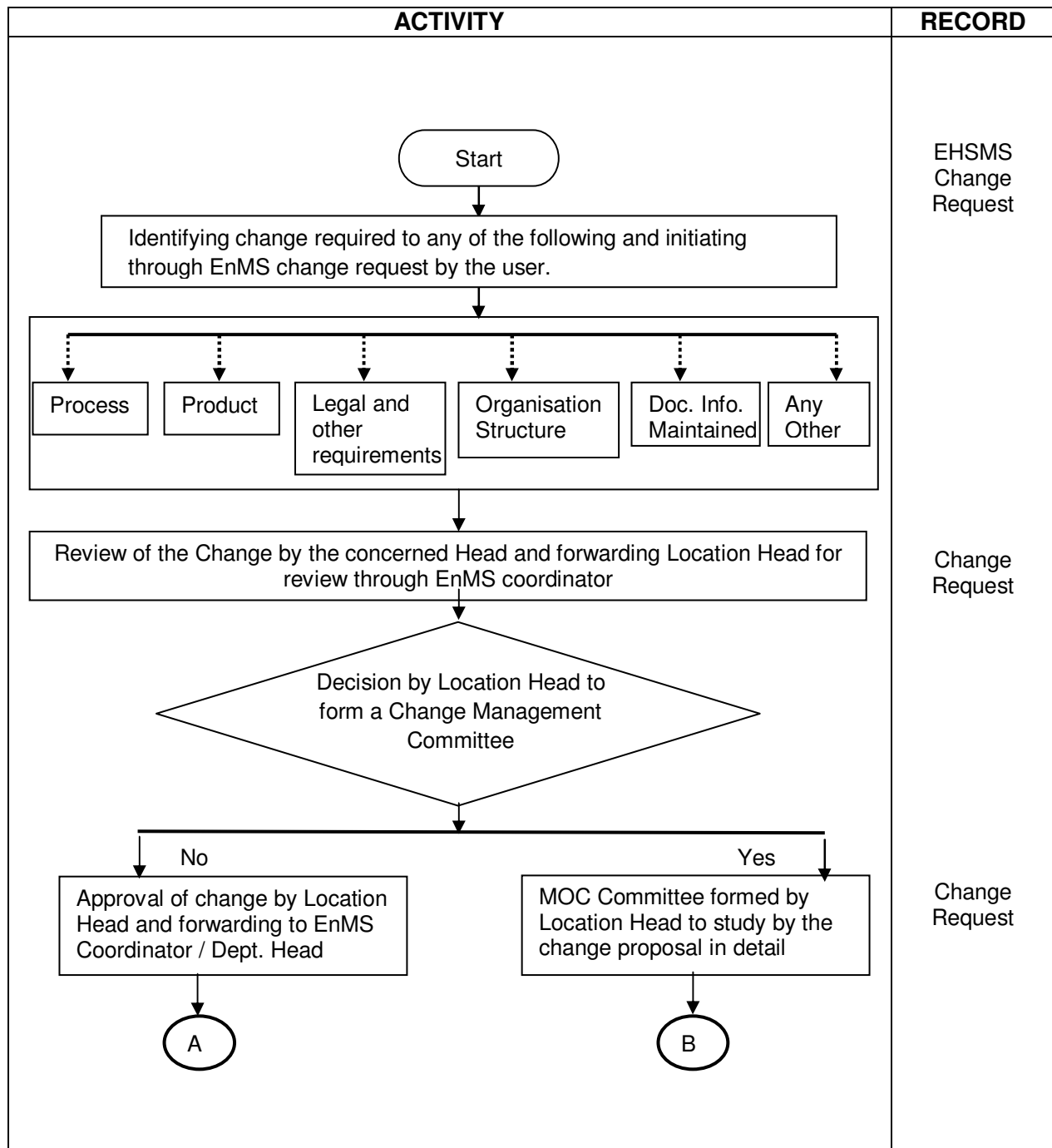
5. RECORDS

- EnMS Change Request

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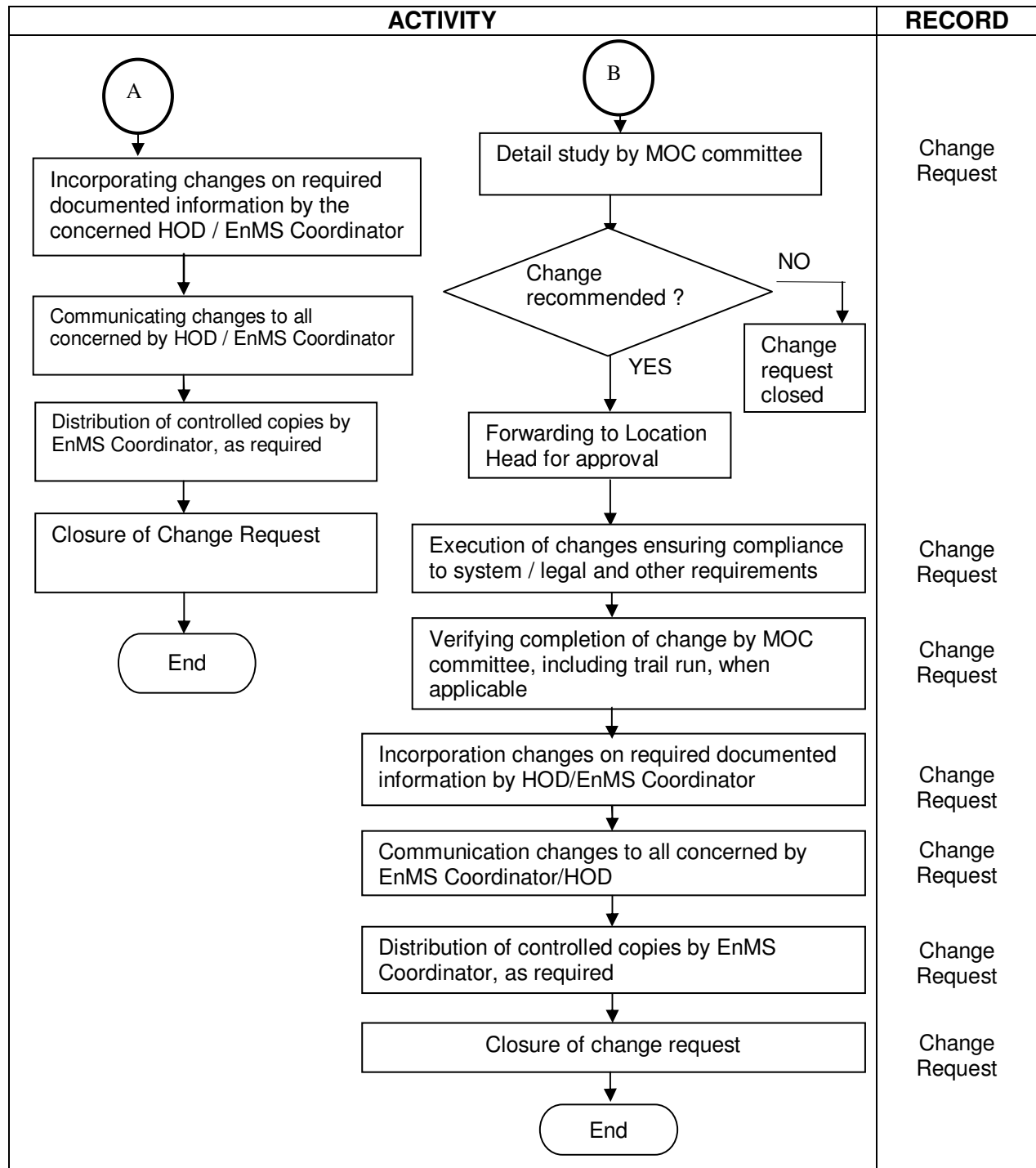
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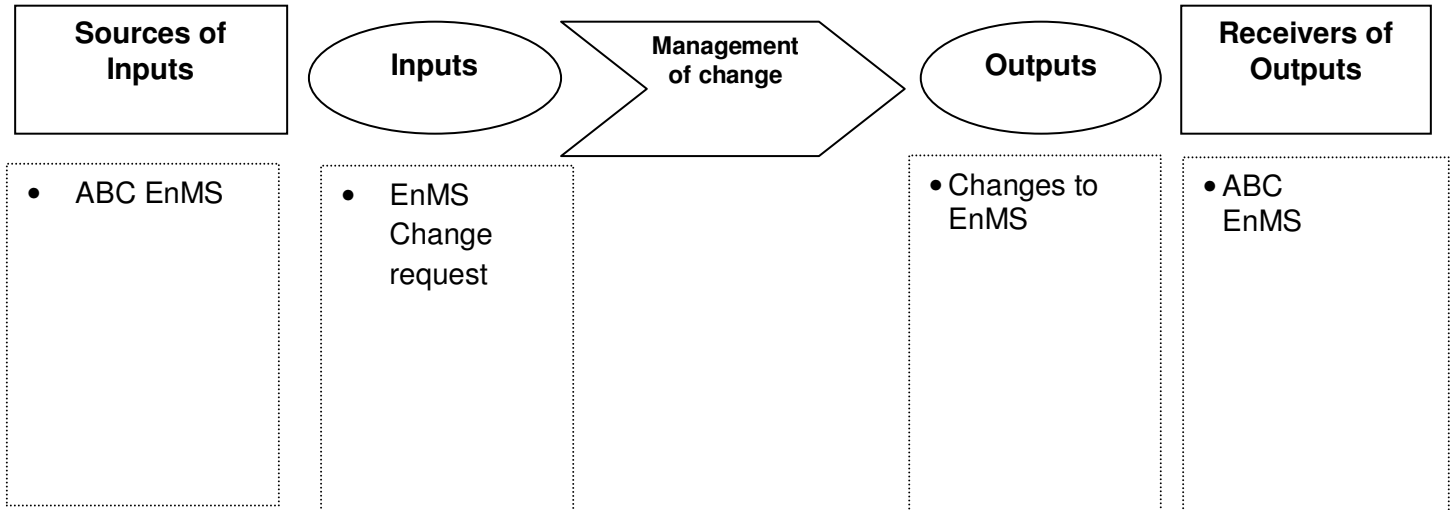
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7. PROCESS MAP



8. PERFORMANCE INDICATORS

Change processing time – from receipt to closure

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PROCESS TITLE: ENERGY PERFORMANCE IMPROVEMENT IN THE DESIGN OF EQUIPMENT, FACILITIES, SYSTEMS AND PROCESSES (ABC/EnMS/PCS/11)

1. OBJECTIVE

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

2. BOUNDARY

It covers design under scope of EnMS.

3. PROCESS OWNER

Location Head
Dept. Heads

4. REFERENCES

- ISO 50001:2018 Requirement: 8.2

5. RECORDS

- Details of all changes taken place in modified and renovated production lines, equipment, processes for the last one year.
- Applicable legal requirements like CEIG approvals, Distribution company approvals, Safety regulations
- Significant Energy Use register for modified/new changes

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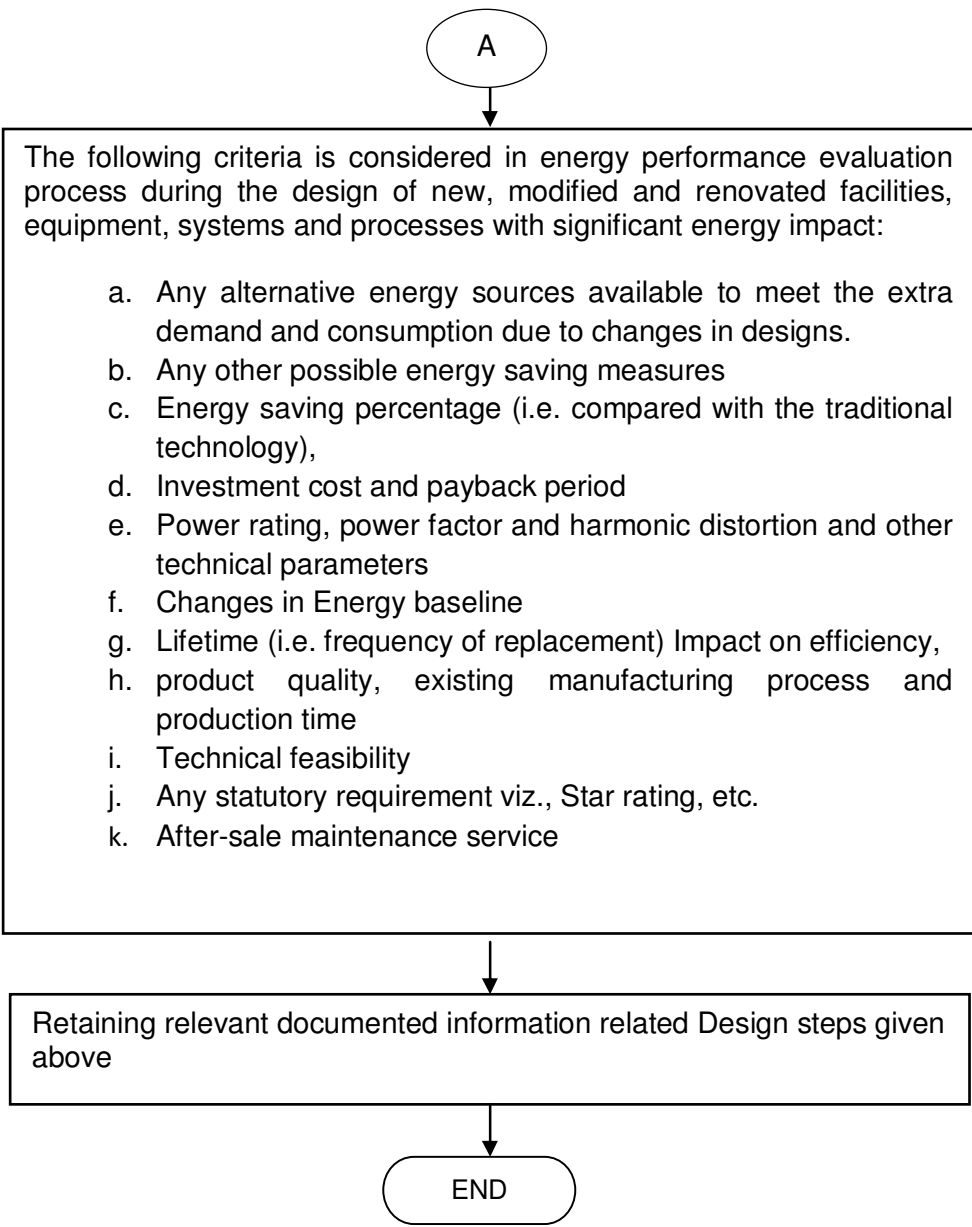
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6. PROCESS FLOW SHEET

ACTIVITY	RECORD
<p style="text-align: center;">Start</p> <p style="text-align: center;">↓</p> <p>Identifying energy performance improvement opportunities at the conception of new, modified and renovated facilities, equipment, systems and processes that can have a significant impact on an ABC's energy performance</p> <p style="text-align: center;">↓</p> <p>Identifying design inputs, reviewing and verifying the design and evaluating the results</p> <p style="text-align: center;">↓</p> <p>Incorporating the results of energy performance evaluation into the specification, design and procurement activities of relevant project(s), to ensure that a sustainable design or an aggressive energy retrofit actually leads to targeted energy outcomes.</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">A</p>	<p>Management of Change</p> <p>Design inputs and evaluation results</p> <p>Design inputs and evaluation results</p>

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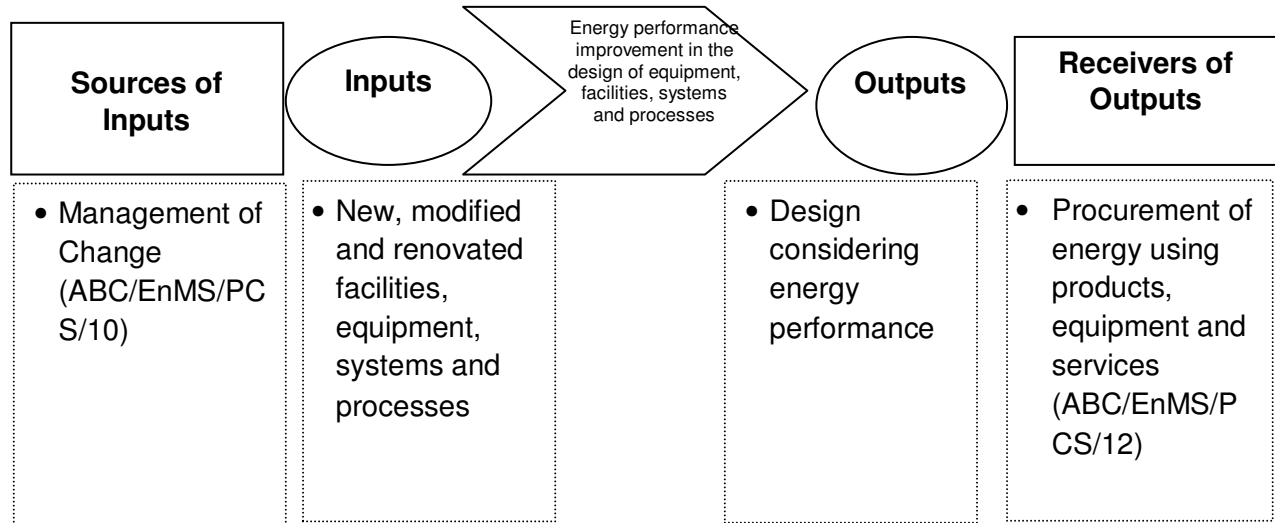
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ACTIVITY	RECORD
 <pre> graph TD A((A)) --> B[The following criteria is considered in energy performance evaluation process during the design of new, modified and renovated facilities, equipment, systems and processes with significant energy impact: a. Any alternative energy sources available to meet the extra demand and consumption due to changes in designs. b. Any other possible energy saving measures c. Energy saving percentage (i.e. compared with the traditional technology), d. Investment cost and payback period e. Power rating, power factor and harmonic distortion and other technical parameters f. Changes in Energy baseline g. Lifetime (i.e. frequency of replacement) Impact on efficiency, h. product quality, existing manufacturing process and production time i. Technical feasibility j. Any statutory requirement viz., Star rating, etc. k. After-sale maintenance service] B --> C[Retaining relevant documented information related Design steps given above] C --> D([END]) </pre> <p>The following criteria is considered in energy performance evaluation process during the design of new, modified and renovated facilities, equipment, systems and processes with significant energy impact:</p> <ol style="list-style-type: none"> Any alternative energy sources available to meet the extra demand and consumption due to changes in designs. Any other possible energy saving measures Energy saving percentage (i.e. compared with the traditional technology), Investment cost and payback period Power rating, power factor and harmonic distortion and other technical parameters Changes in Energy baseline Lifetime (i.e. frequency of replacement) Impact on efficiency, product quality, existing manufacturing process and production time Technical feasibility Any statutory requirement viz., Star rating, etc. After-sale maintenance service <p>Retaining relevant documented information related Design steps given above</p> <p>END</p>	

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8. PROCESS MAP



8. PERFORMANCE INDICATORS

Savings due to considering energy performance in Design

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PROCESS TITLE: PROCUREMENT OF ENERGY USING PRODUCTS, EQUIPMENT AND SERVICES (ABC/EnMS/PCS/12)

1. OBJECTIVE

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

2. BOUNDARY

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

3. PROCESS OWNER

Head-Purchase

4. REFERENCES

- ISO 50001 Requirement: 8.3
- QMS Process: Purchasing

5. RECORDS

- All records as per QMS Process: Purchasing

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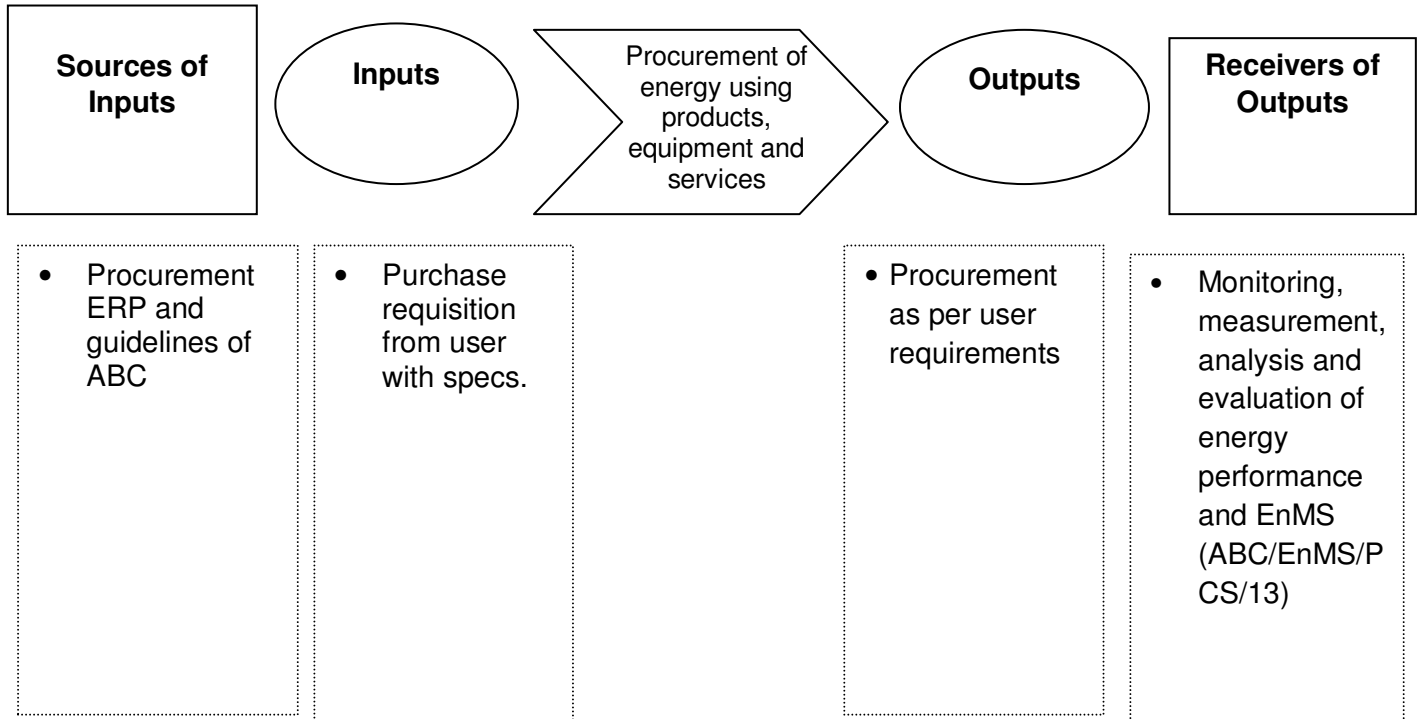
6. PROCESS FLOW SHEET

ACTIVITY	RECORD
<p>START</p> <p>↓</p> <p>Receipt of Purchase Request from the user by Purchase Dept. for procurement of energy using products/equipment/ services with specifications incl. energy performance</p> <p>↓</p> <p>In case of products / equipment / services which are expected to have significant impact on ABC energy performance – establishing criteria for evaluating energy performance over the planned or expected operating life time</p> <p>↓</p> <p>Carrying out procurement by Purchase dept. as per existing Purchase Process (under QMS). In case of energy using products / equipment / services that have or can have impact on SEUs, information to supplier through enquiry that energy performance is one of the evaluation criteria for procurement</p> <p>↓</p> <p>Retaining information related to above by Purchasing dept.</p> <p>↓</p> <p>END</p>	<p>Purchase request</p> <p>Purchase order</p> <p>Enquiry Purchase order</p>

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7. PROCESS MAP



8. PERFORMANCE INDICATORS

Energy savings through procurement.

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**PROCESS TITLE: MONITORING, MEASUREMENT, ANALYSIS AND EVALUATION
OF ENERGY PERFORMANCE AND EnMS(ABC/EnMS/PCS/13)**

1. OBJECTIVE

To monitor, measure, analyse and evaluate the energy performance and EnMs.

2. BOUNDARY

As per the energy performance evaluation schedule.

3. PROCESS OWNER

Location Head
Dept. Heads
EnMS Coordinator

4. REFERENCES

- ISO 50001: 2018 Requirement: 9.1

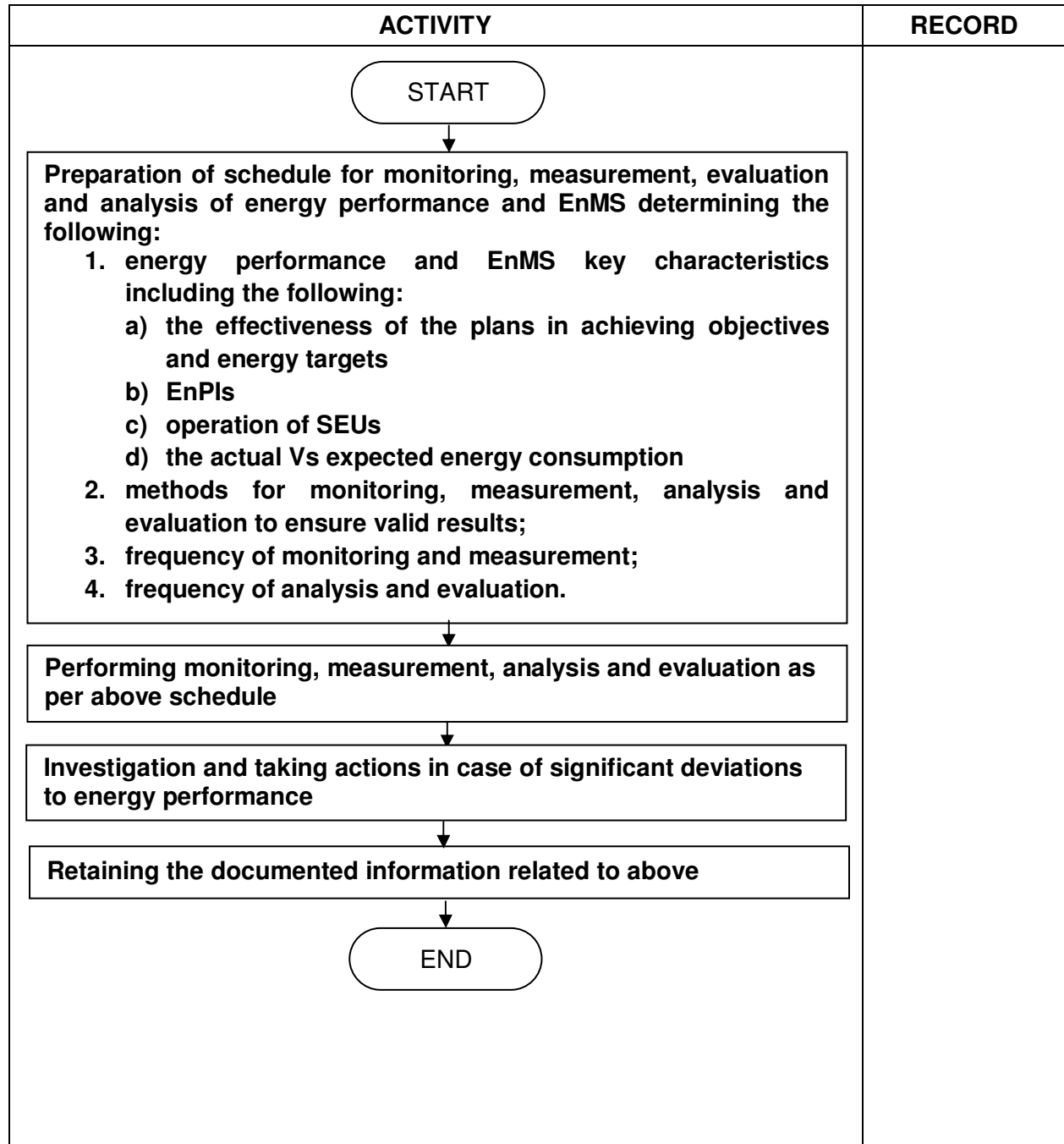
5. RECORDS

- Schedule of energy performance and EnMS

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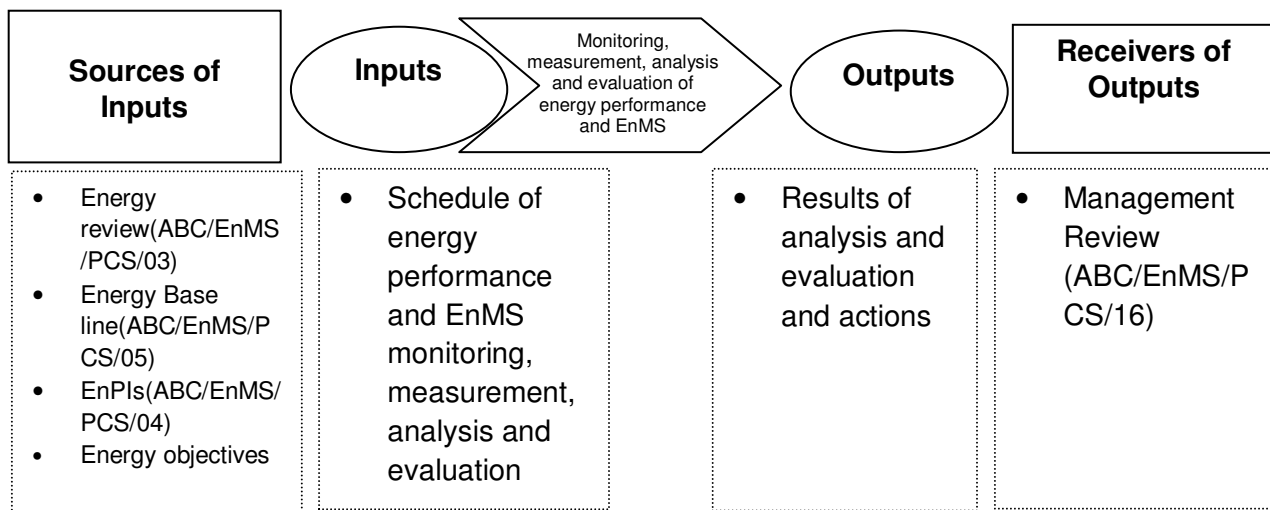
6. PROCESS FLOW SHEET



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7. PROCESS MAP



8. PERFORMANCE INDICATOR

a) Deviation to Schedule of energy performance and EnMS

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**PROCESS TITLE: NONCONFORMITIES AND CORRECTIVE ACTION
(ABC/EnMS/PCS/14)**

1. OBJECTIVE

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

2. BOUNDARY

It covers nonconformities related to EnMS.

3. PROCESS OWNER

Location Head
Dept. Heads

4. REFERENCES

- ISO 50001:2018 Requirement: 10.2

5. RECORDS

- Nonconformities and corrective action record

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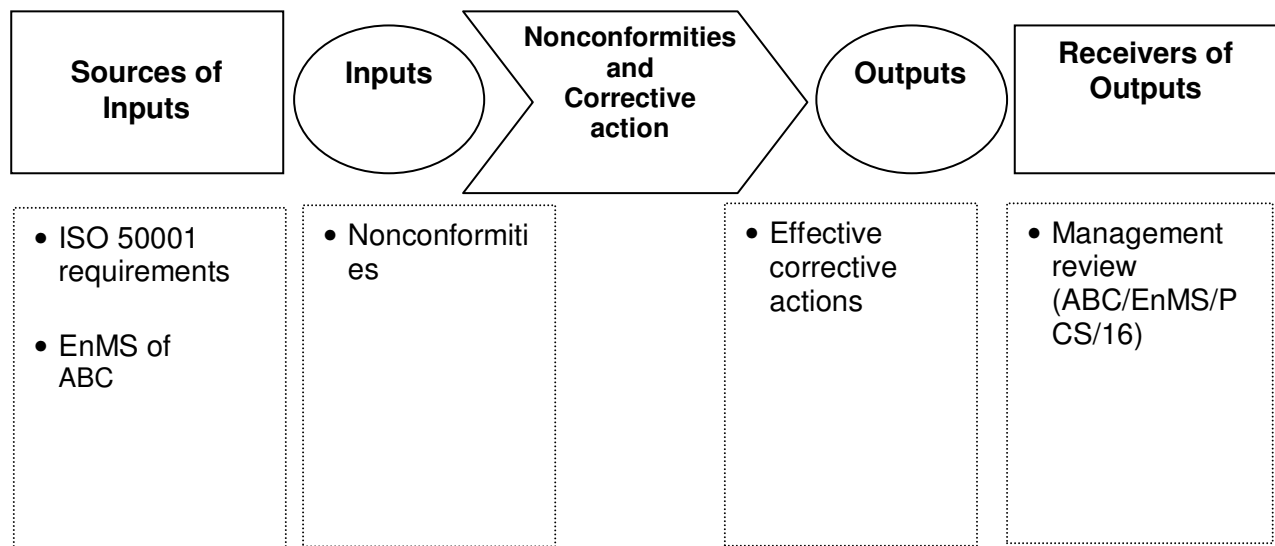
6. PROCESS FLOW SHEET

ACTIVITY	RECORD
<p>START</p> <p>Capturing EnMS nonconformities by the concerned department / EnMS coordinator</p> <p>Review of above nonconformities in by the concerned Dept. Head / Location Head</p> <p>Analysis above information and taking correction / corrective action by the concerned department(s)</p> <p>Review of the effectiveness of correction & corrective action by the concerned Dept. Head</p> <p>Review of risks and opportunities for incorporating changes, if required</p> <p>Changes to EnMS by EnMS coordinator, as required</p> <p>END</p>	<p>Nonconformity record</p> <p>Corrective action record</p> <p>Corrective action record</p> <p>--</p> <p>EnMS change request</p>

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7. PROCESS MAP



8. PERFORMANCE INDICATORS

- No. of repeated Nonconformities

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PROCESS TITLE: INTERNAL AUDIT (ABC/EnMS/PCS/15)

1. OBJECTIVE

To carry out internal auditing to determine whether EnMS

- conforms to the planned arrangements, to the requirements of ISO 50001:2018 and to the EnMS established by ABC, and
- is effectively implemented and maintained.

2. BOUNDARY

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

3. PROCESS OWNER

Location Head
EnMS Coordinator

4. REFERENCES

- ISO 50001:2018 Requirement: 9.2

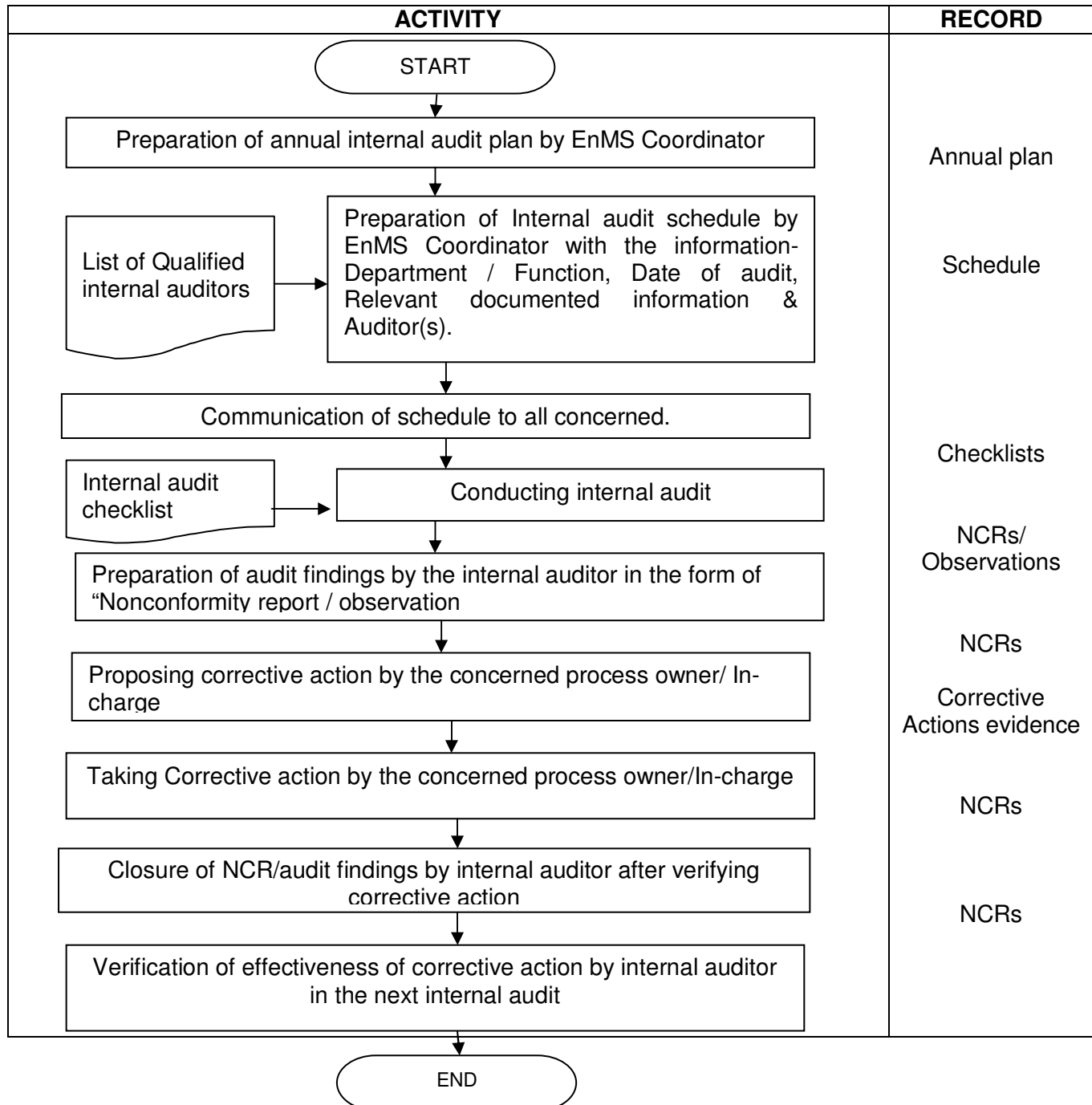
5. RECORDS

- Internal Audit Plan
- Internal Audit Schedule
- Internal audit Check List
- Nonconformity for Internal Audit
- Internal Audit Nonconformities - Summary

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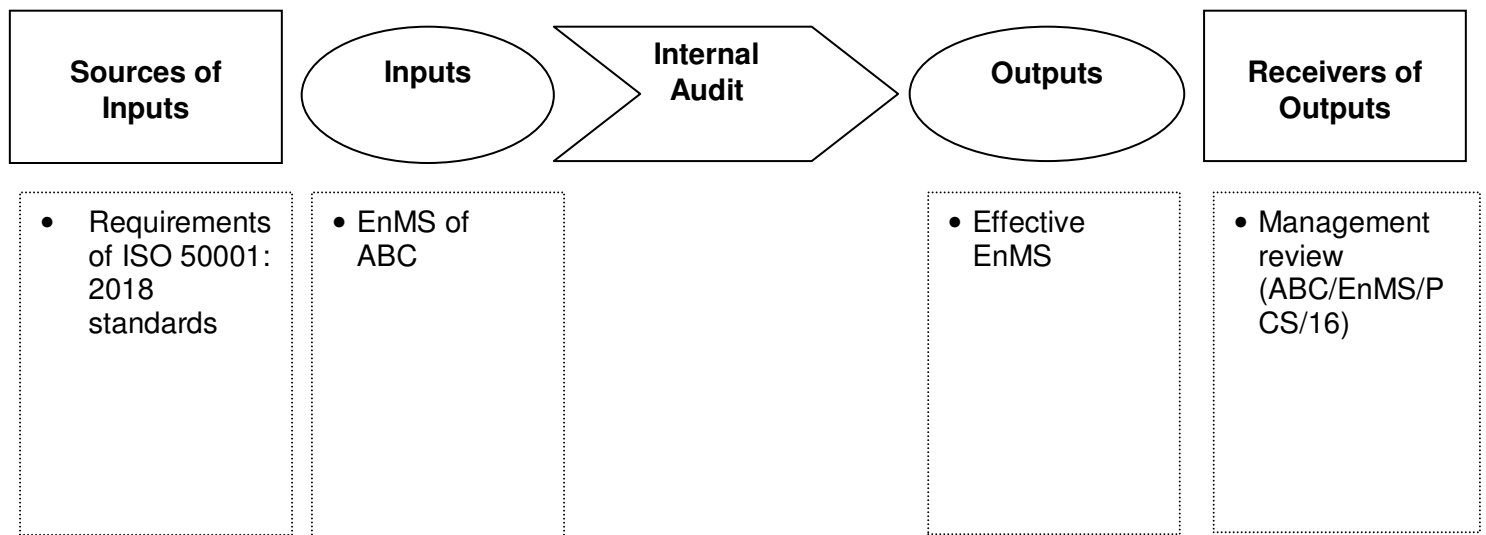
6. PROCESS FLOW SHEET



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7. PROCESS MAP



8. PERFORMANCE INDICATORS

No. of audits per year planned vs. conducted.

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PROCESS TITLE: MANAGEMENT REVIEW (CTROLS/EnMS/PCS/16)

1. OBJECTIVE

To review the effectiveness of EnMS to ensure its continuing suitability, adequacy, effectiveness and alignment with the strategic direction of ABC.

2. BOUNDARY

Conducting management review as per agenda based on inputs of ISO 50001:2018 standard.

3. PROCESS OWNER

Top Management
Location Head

4. REFERENCES

- ISO 50001:2018 Requirement: 9.3

5. RECORDS

- Management Review Circular
- Minutes of Management Review meeting

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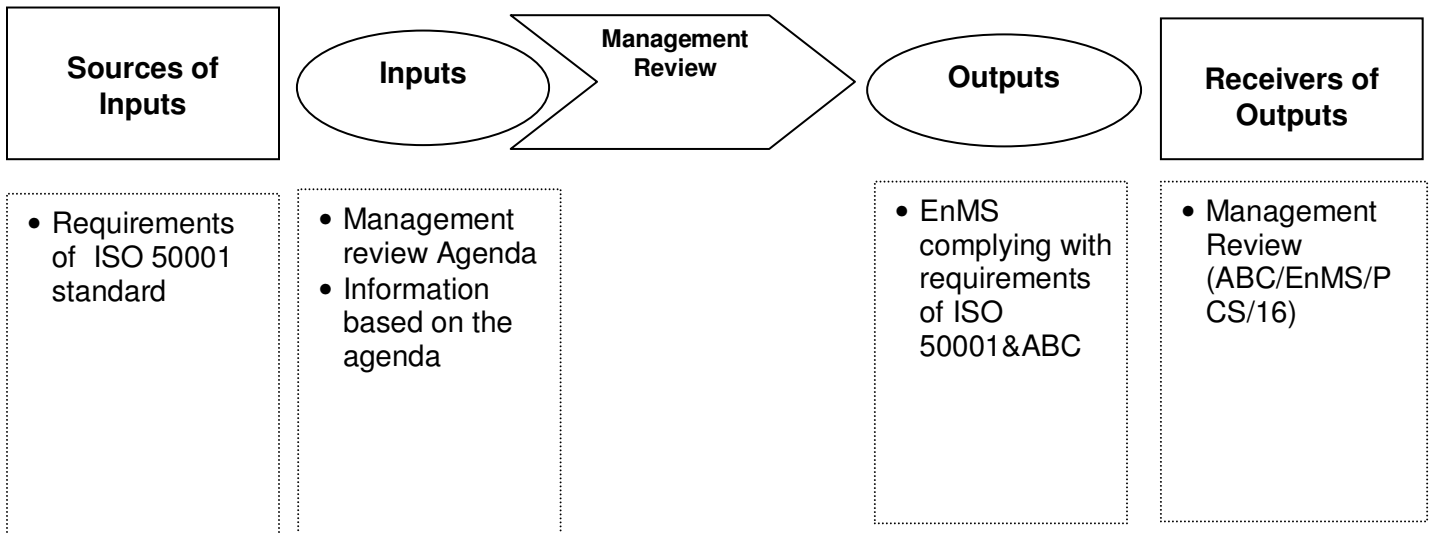
EnMS Management Review Agenda:

Sl.	Agenda point
1.	The status of actions from previous management review;
2.	Changes in external and internal issues and associated risks and opportunities that are relevant to the EnMS;
3.	Nonconformities and corrective actions
4.	Monitoring and measurement results
5.	Audit results
6.	Results of the evaluation of compliance with legal requirements and other requirements
7.	Opportunities for continual improvement, including those for competence
8.	Energy policy
9.	The extent to which objectives and targets have been achieved
10.	Energy performance and energy performance improvement based on monitoring and measurement results including the EnPI(s)
11.	Status of the action plans
12.	Adequacy of resources
13.	Competence, Awareness and communication
14.	Changes to EnPIs/ Energy Baseline
15.	Opportunity to improve integration with business processes

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7. PROCESS MAP



8. PERFORMANCE INDICATORS

- EnMS objectives achievement