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Strategic Energy Management (SEM) with ISO 50001 and 50001 Ready

ORNL 50001 Ready Training Webinar Series, Session 5
March 17, 2026
10:00 a.m. to 12:30 p.m.

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Agenda – Session FIVE

- Welcome, Safety, and Housekeeping
- Review Previous Sessions
- Today's Content – ***Engaging Other Functions***

SUPPORT, Section 4:

  - Task 14 - Competence and Training
  - Task 15 - Awareness and Communication
  - Task 16 - Documenting the EnMS

OPERATION, Section 5:

  - Task 17 - Operational Controls
  - Task 18 - Energy Considerations in Design
  - Task 19 - Energy Considerations in Procurement

- Webinar Training Schedule & Preparations
- Kahoot Quiz Game
- Q&A

But first, a POLL!

Polling Question 1

Polling Question

1) Based on completing FOUR of the EIGHT 50001 Ready training sessions, what are your plans for 50001-based EnMS implementation?
   A. I plan to implement many of the SEM principles that I have learned to improve my EnMS.
   B. I plan to work toward 50001 Ready Recognition after completing this training.
   C. I plan to work toward ISO 50001 third-party certification after completing this training.
   D. I plan to do all the above.
   E. I would like more information on programs to help me with the above.
   F. Other.

Welcome

- Welcome to the Virtual INPLT *50001 Ready* webinar training series
- Eight, 2-1/2 hour webinars, focused on Strategic Energy Management (SEM), in general, and the ISO 50001 standard and *50001 Ready Navigator,* in particular
- The webinars will help you understand the why and how of SEM and the *50001 Ready Navigator* tool
- Thank you for your interest!

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Safety and Housekeeping

- Please make sure your surroundings are safe
  - If you are driving, please use hands-free mode
  - If you are in a building, be sure you know the exit paths
  - If you are at home, be sure there are no distractions
- You are welcome to ask questions at any time
- When not asking a question, please mute your mic
- We are recording these webinars, and by staying online, you are giving consent to be recorded
  - A link to the recorded webinars will be provided

Our 50001 Ready Training Group

Review of Previous Sessions

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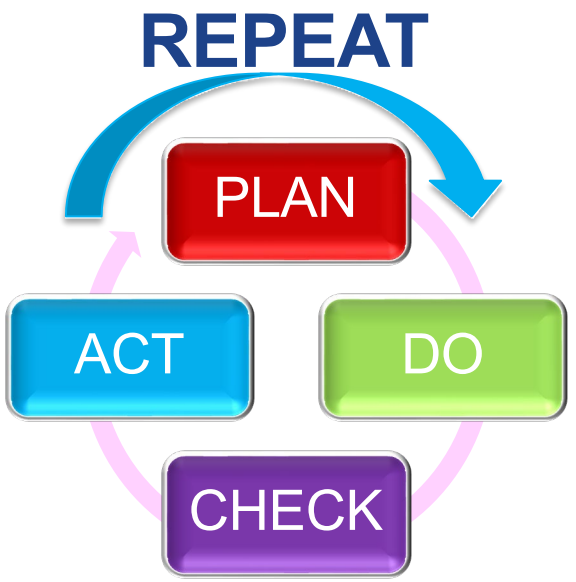
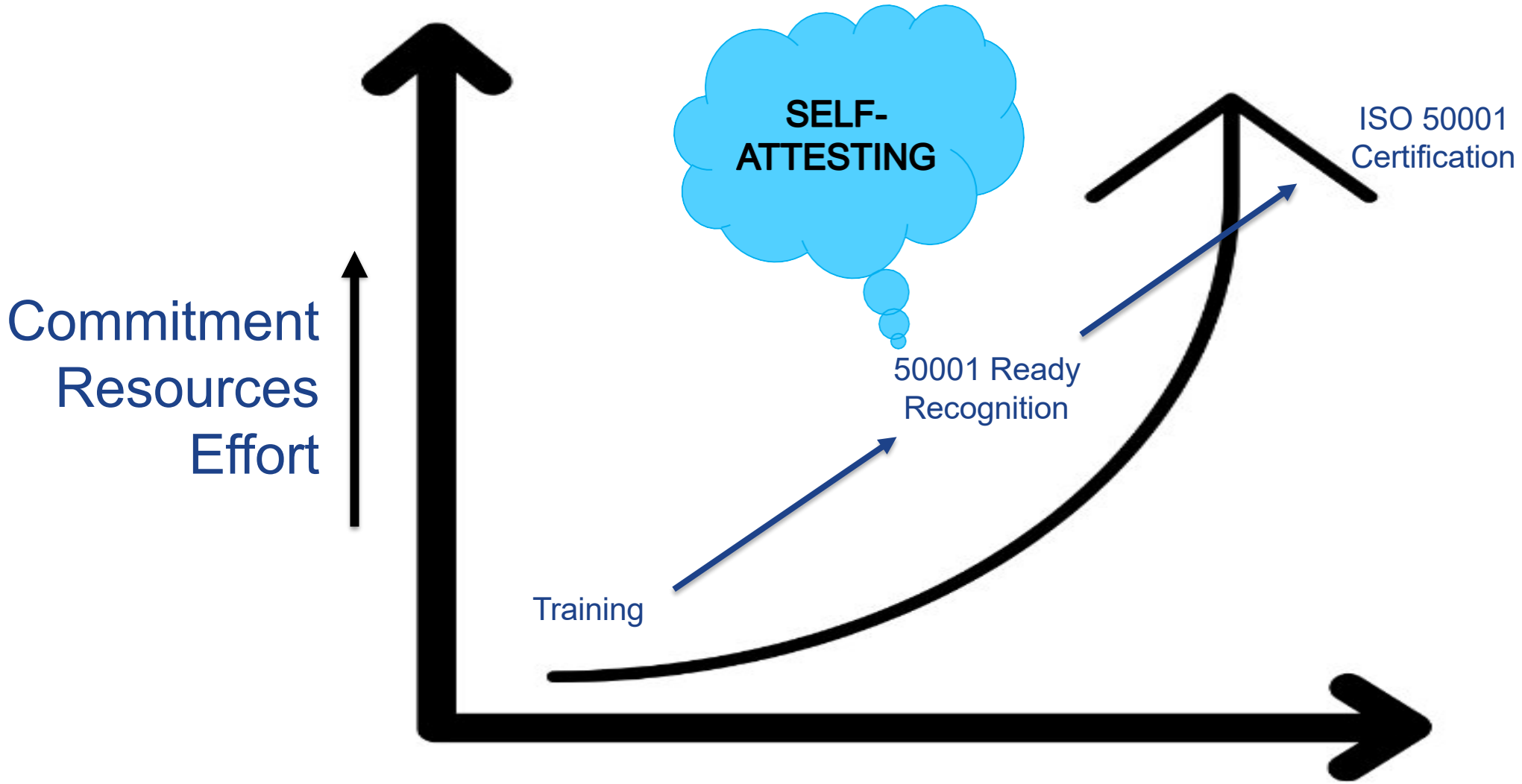
Quick List of Acronyms

- SEM = Strategic Energy Management
- EnMS = Energy Management System
- SEU = Significant Energy Use
- EnPI = Energy Performance Indicator
- EnB= Energy Baseline
- PDCA = Plan, Do, Check, Act – REPEAT!

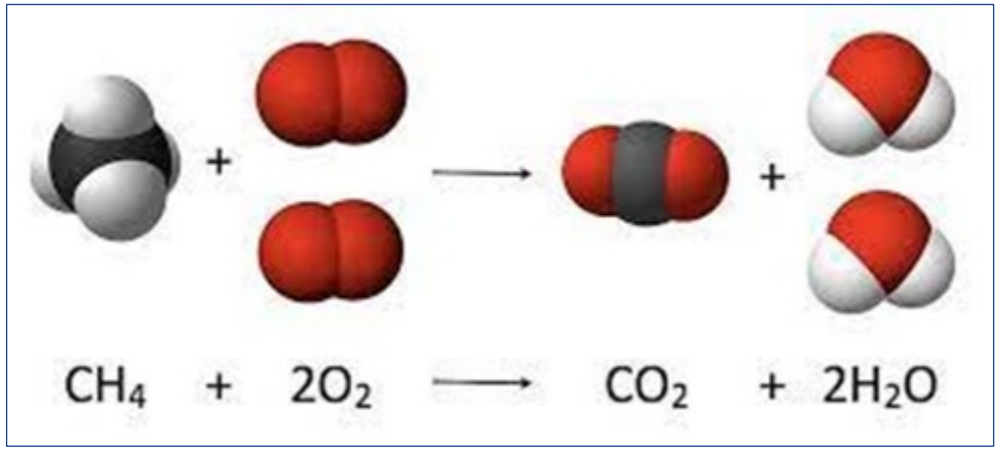


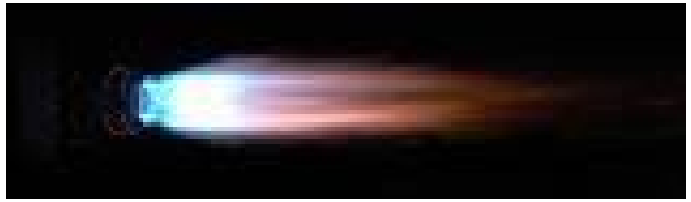
Pathways for 50001 Energy Management

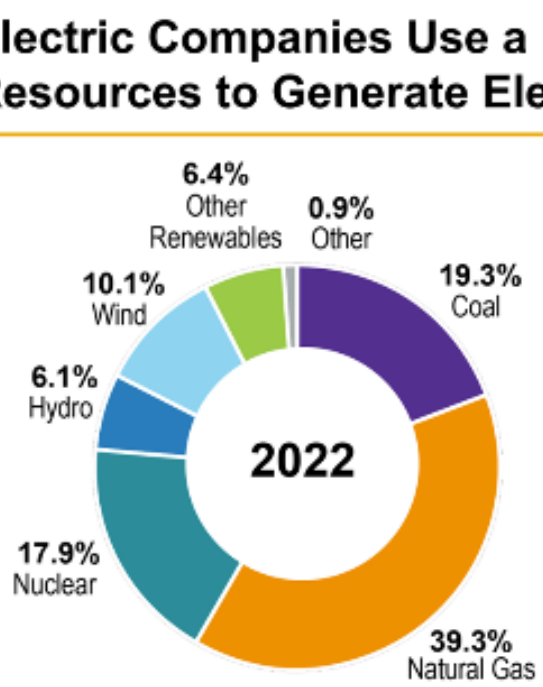


Why SEM? – The Energy –Carbon Connection

- The best way to manage your carbon is to manage your energy.







Context of the Organization (Tasks 1-3) + 7

Building a foundation for your EnMS

Regarding my EnMS, what are the:

- *Risks, opportunities and strategic issues;*
- *Legal and other requirements;*
- *Interested parties;*
- *Scope and boundaries?*

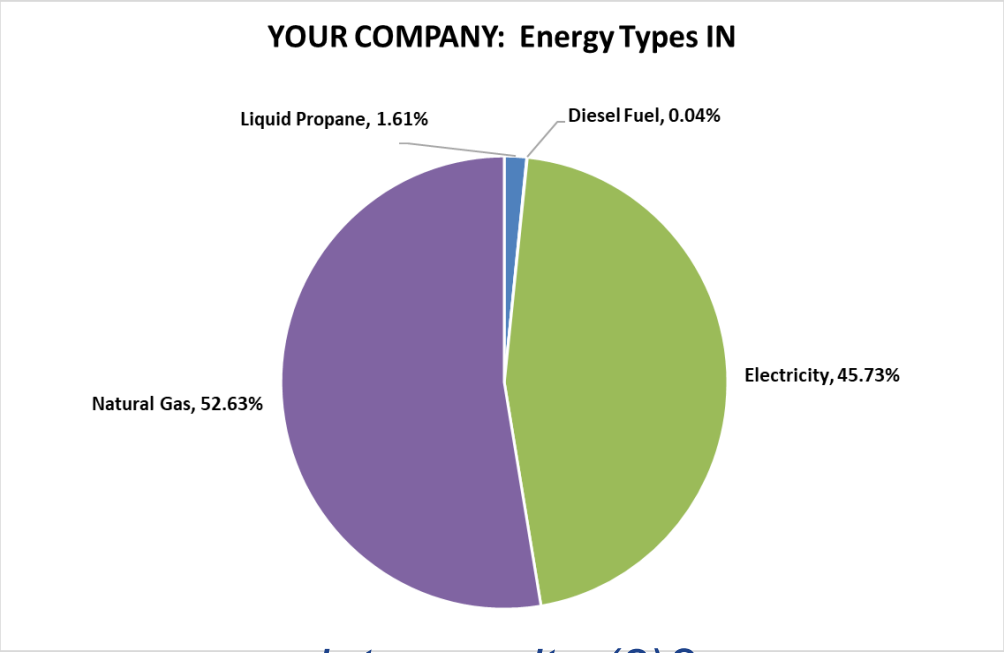
Leadership (Task 4 - 6)

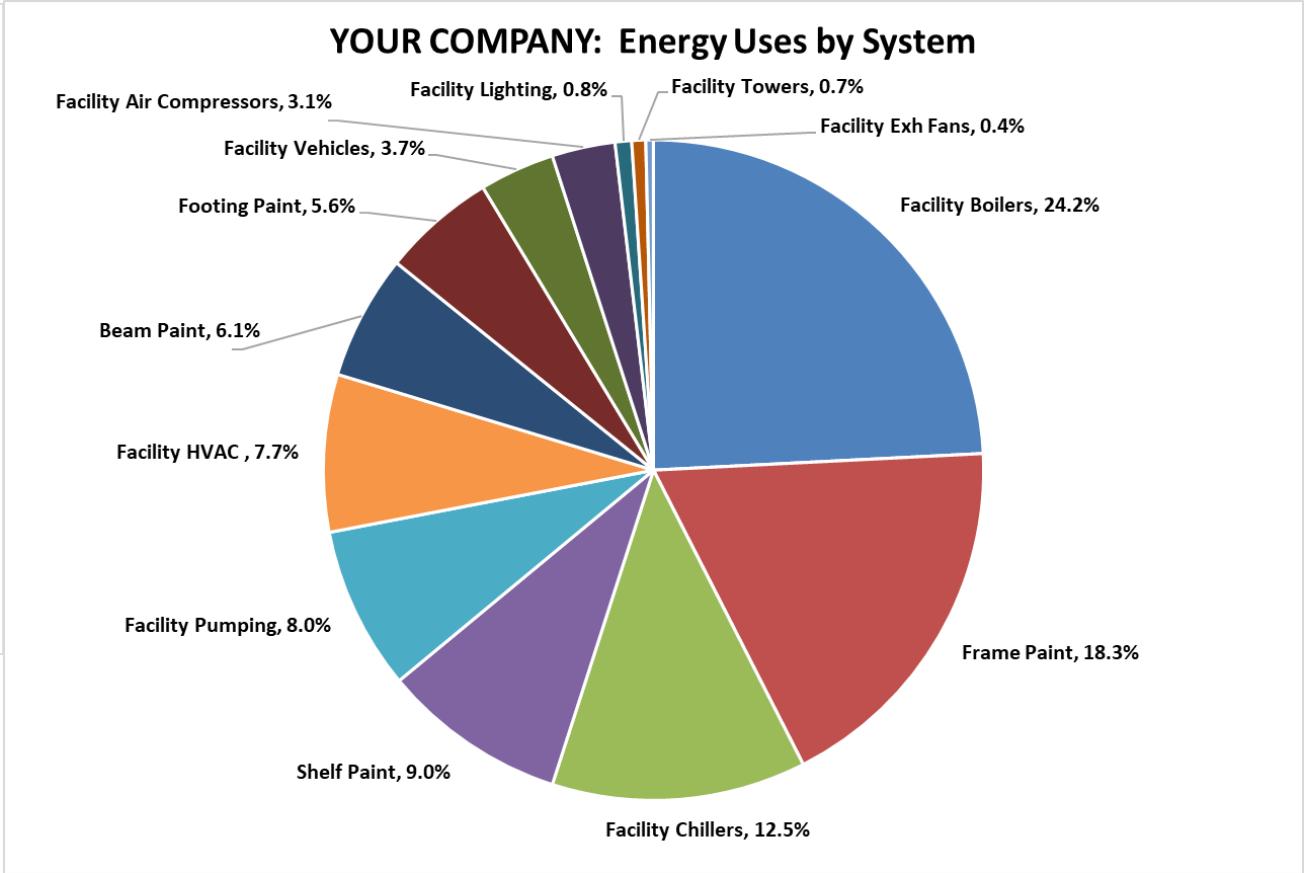
Commitment and guidance from the top

Is there strong top management commitment to the EnMS?
Is there a clear and well-communicated energy policy?
Are there adequate resources for the energy team to carry out the implementation of the EnMS?

Planning (7) - Two Key Pie Charts (Tasks 7 – 13)

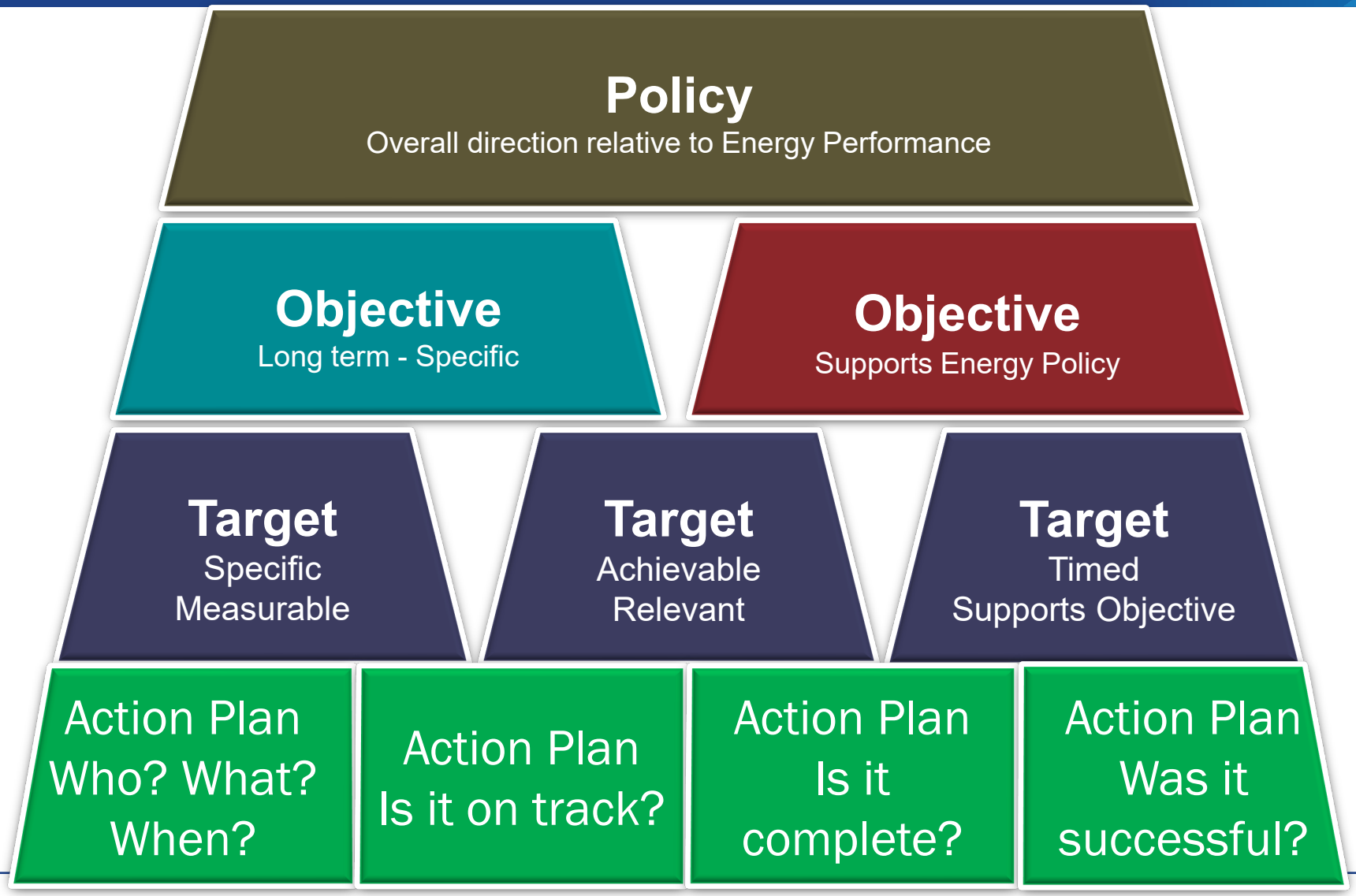
Understanding your energy performance





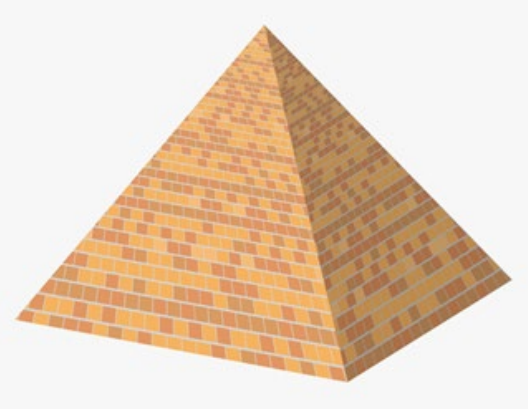
What energy comes into my site (8)?
Where does all this energy go (9)? [SEUs]
What are my energy saving projects (10)?
What are my EnPIs and EnBs (11)?
What are my objectives, energy targets & action plans (12 & 13)?

Task 13: Relationships



Tasks 8-13: The Big Picture

- Building the energy success pyramid starts with a wide base of small actions that build to the completion of energy policy



Policy

Objectives

Energy Targets

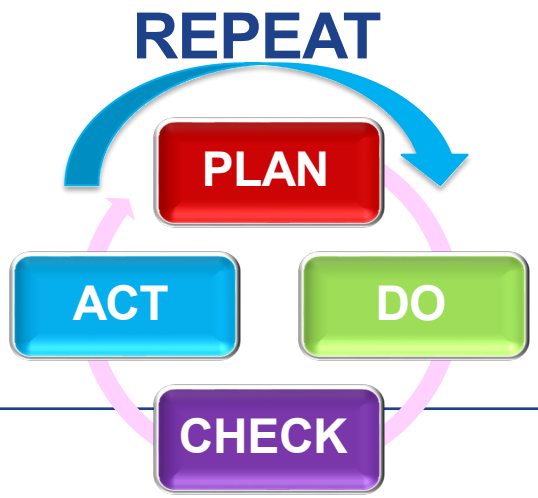
Action Plans

Operational Controls

Covering Today

50001 Ready: Review Previous Tasks

Context of the Organization	Leadership	Planning	Support	Operation	Performance Evaluation	Improvement
1. An EnMS and your Organization 2. People and Legal Requirements 3. Scope and Boundaries	4. Management Commitment 5. Energy Policy 6. Energy Team and Resources	7. Risks to EnMS Success 8. Energy Data Collection and Analysis 9. Significant Energy Uses 10. Improvement Opportunities 11. Energy Performance Indicators (EnPIs) and Baselines (EnBs) 12. Objectives and Targets 13. Action Plans for Continual Improvement	14. Competence and Training 15. Awareness and Communication 16. Documenting the EnMS	17. Operational Controls 18. Energy Considerations in Design 19. Energy Considerations in Procurement	20. Monitoring and Measurement of the EnMS 21. Monitoring and Measurement of Energy Performance Improvement 22. Internal Audit 23. Management Review	24. Corrective Action 25. Continual Improvement



Introduction to the 8-Month Cohort Process

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50001 Ready 8-Month Cohort Schedule - Example

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= (1) Pre-training orientation and data collection

= (8) 2-hr Group Training Sessions – Every four weeks

= (8) 1-on-1 Coaching Calls – Scheduled two weeks after training

= (1) Post-Training follow up assessment and data collection

= Homework and Site Implementation between sessions

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Polling Question 2

Polling Question

2) Based on your organization's goals for the implementation of an EnMS, what level of interest would you have in participating in a follow-on 50001 Ready 8-month cohort with a deeper implementation and a longer-time commitment?

A. We are very interested in this and would likely participate.
B. We are interested but need to know more about the process.
C. We would not be interested at this time but perhaps later.
D. We feel that we can move forward and meet our goals without cohort participation.

Polling Question 3

Polling Question

3) Thinking about barriers, what would *prevent* you from participating in a follow-on 50001 Ready 8-month cohort after this 50001 Ready Virtual training?

A. Resources (staff availability and time commitment).
B. No support from top management.
C. Unsure of our organization's overall direction.
D. I have learned everything I need from this training and do not need the cohort.
E. Nothing. I plan to participate in the follow-on cohort.

Today's Content: Tasks 14 - 19

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50001 Ready Navigator: Today's Tasks

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Context of the Organization	Leadership	Planning	Support	Operation	Performance Evaluation	Improvement
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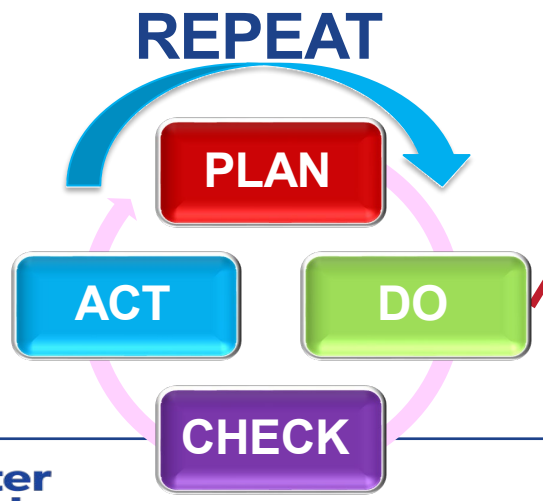
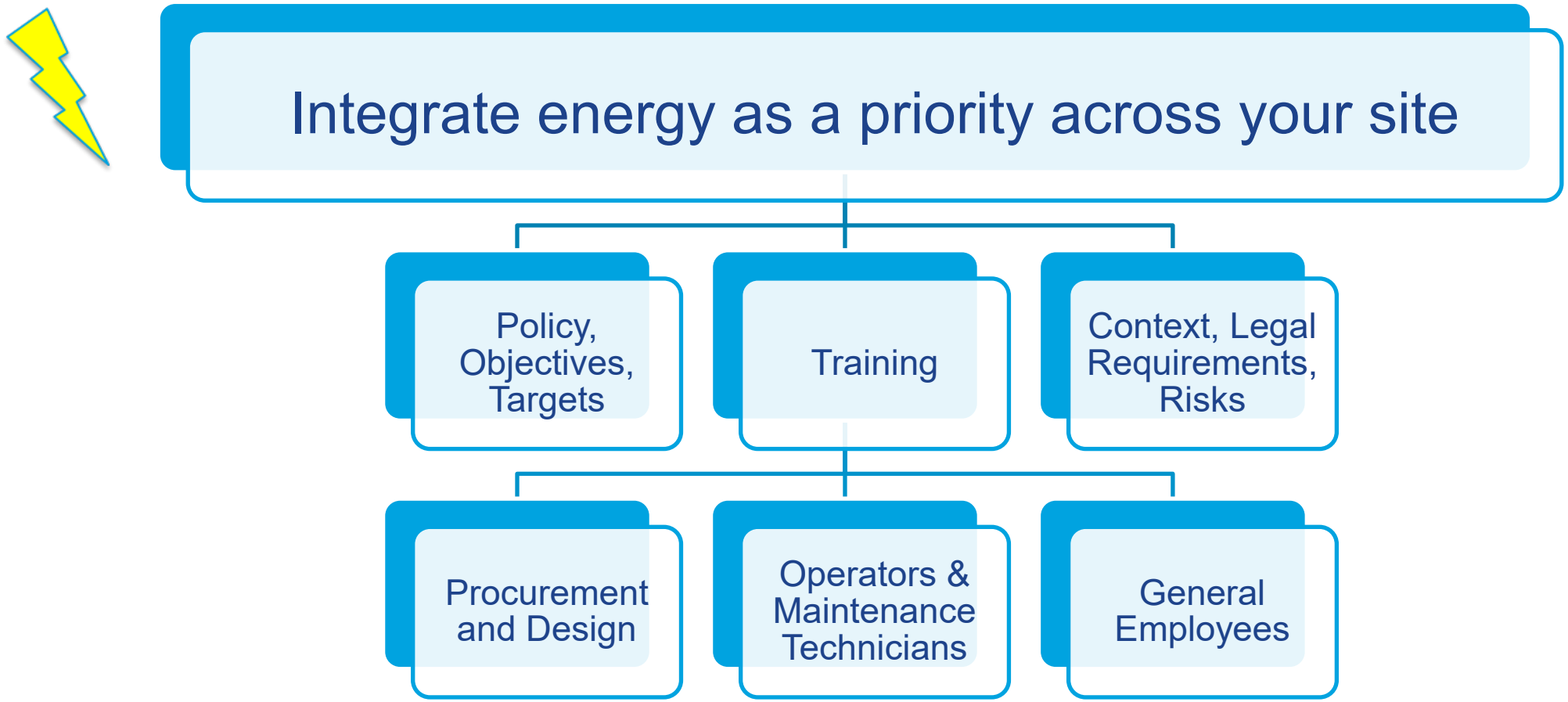


Engaging Other Functions



Support (3)

Ensure all team members who impact energy performance understand their role

Who impacts energy performance and our EnMS?
Are they aware, competent, trained, documented?
Is our training for them effective?
Do we maintain good documentation and records of our EnMS?

Task 14: Competence and Training

Task 14: We ensure the competence of personnel whose work affects our energy performance and EnMS.

We evaluate for effectiveness of actions taken to acquire competencies.

We retain appropriate records of competencies and training.

Task 14: Competence Defined

What does competence in a role mean?

Who requires competence?

What are specific tasks this function performs?

What is automated and what depends on the individual?

How is performance assessed in this role?

3.4.12
competence
ability to apply knowledge and skills to achieve intended results

Task 14: Who Needs Competence

- Boiler Technicians
- HVAC Technicians
- Process Operators
- Energy team members
- Data collectors
- Others

Functions who impact energy performance and the EnMS, including those who work directly with SEUs, EnPIs, O&M, data collection, etc.

Task 14: Ensuring Competence

How can we establish competence?

Through:

- *Education – a certain degree requirement*
- *Training – must attend and pass specific classes*
- *Skills – must obtain a maintain a specific certification, e.g., boiler or wastewater operator, etc.*
- *Experience –number of years working in a particular area*

Task 14: Actions for Competence

How can we ensure competence is maintained?

Can performance be linked to employee evaluations?

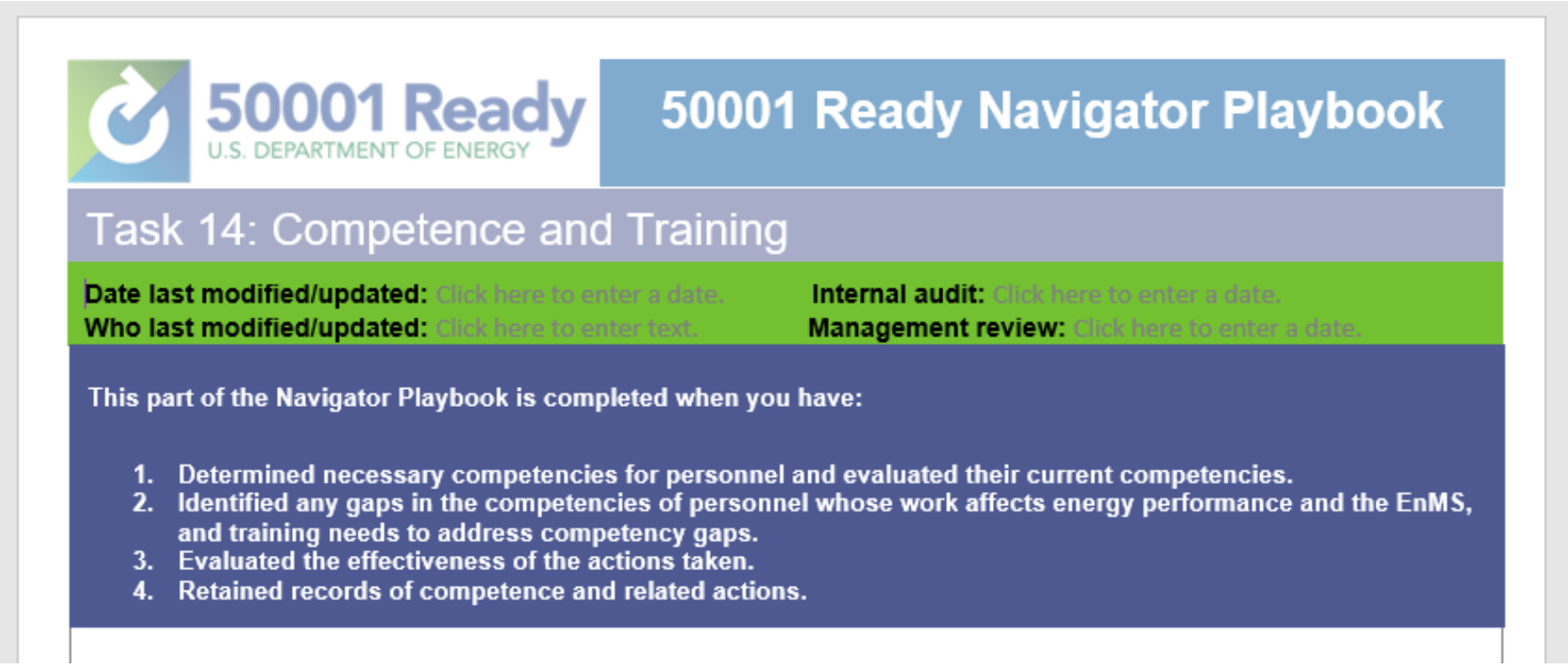
Can trainings be held for all relevant employees regularly (annually or on other relevant interval)?

Tracking system for certifications, classes, etc.?

Task 14: Playbook

Activity

- Look at Task 14 in 50001 Ready
- Look at the Task 14 Playbook



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50001 Ready Navigator Playbook

Task 14: Competence and Training

Date last modified/updated: Click here to enter a date.
Who last modified/updated: Click here to enter text.
Internal audit: Click here to enter a date.
Management review: Click here to enter a date.

This part of the Navigator Playbook is completed when you have:

1. Determined necessary competencies for personnel and evaluated their current competencies.
2. Identified any gaps in the competencies of personnel whose work affects energy performance and the EnMS, and training needs to address competency gaps.
3. Evaluated the effectiveness of the actions taken.
4. Retained records of competence and related actions.

Task 15: Awareness and Communications

Task 15: Our personnel and on-site contractors are aware of our energy policy and their energy-related roles and responsibilities.

We have processes in place for internal and any applicable external EnMS communications.

Task 15: Communications Start at the Top

- Leadership
  - Communicating the importance of effective energy management and of conforming to the EnMS requirements
- The initial message
  - Who, what, when, where, why and how of the EnMS
  - Broadest possible communication
- Deeper message to key affected personnel
  - The bigger the potential impact the more they need to know

Task 15: Communications Are Ongoing

Ongoing Communication Topics:

- Energy policy
- Importance of energy management
- Energy management responsibilities and authorities
- Energy objectives
- Energy performance successes

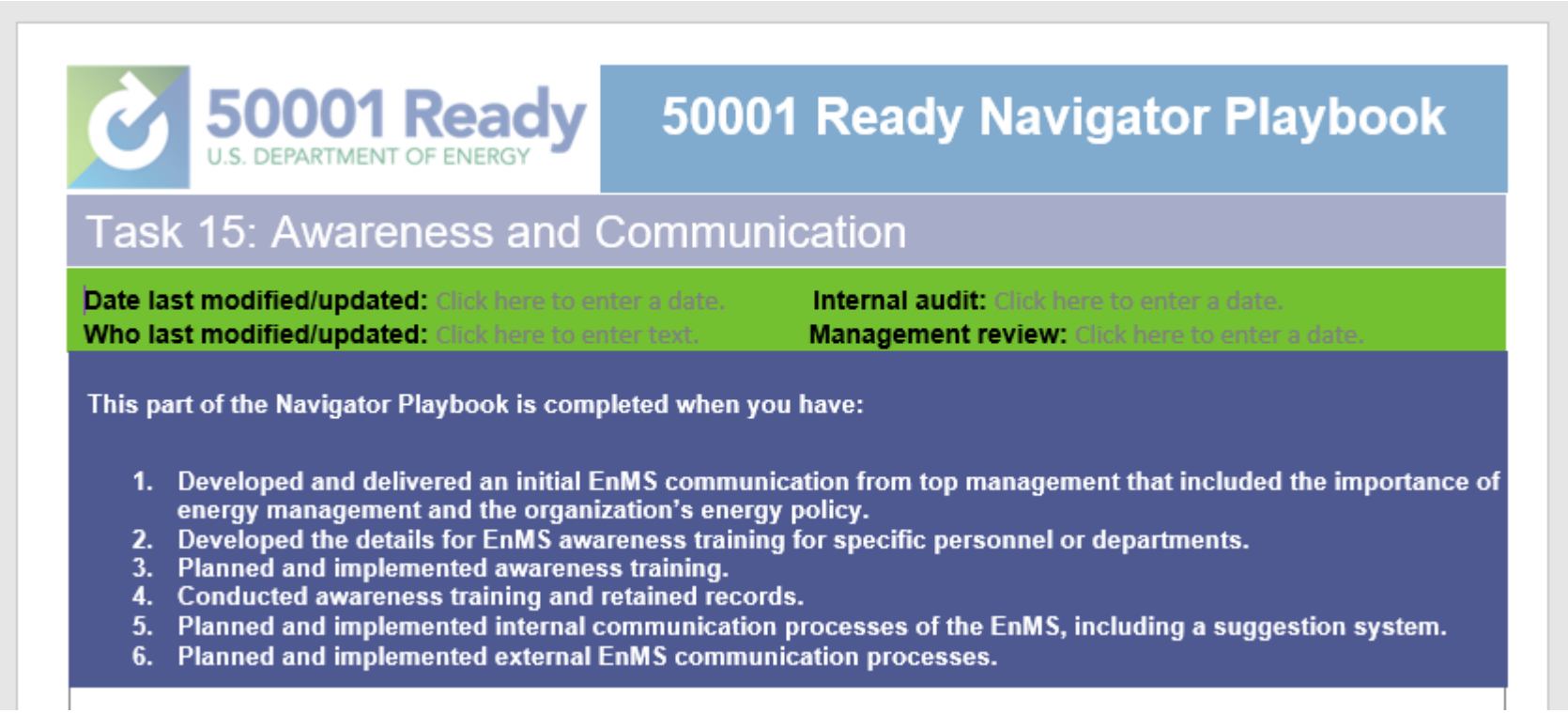
GET INPUT:

Have a method or system to get input on the EnMS from employees and contractors. This is a requirement of ISO 50001

Task 15: Playbook

Activity

- Look at Task 15 in 50001 Ready
- Look at the Task 15 Playbook



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50001 Ready Navigator Playbook

Task 15: Awareness and Communication

Date last modified/updated: Click here to enter a date.
Who last modified/updated: Click here to enter text.
Internal audit: Click here to enter a date.
Management review: Click here to enter a date.

This part of the Navigator Playbook is completed when you have:

1. Developed and delivered an initial EnMS communication from top management that included the importance of energy management and the organization's energy policy.
2. Developed the details for EnMS awareness training for specific personnel or departments.
3. Planned and implemented awareness training.
4. Conducted awareness training and retained records.
5. Planned and implemented internal communication processes of the EnMS, including a suggestion system.
6. Planned and implemented external EnMS communication processes.

Task 16: Documentation

Task 16: We have the documented information we determined is needed to ensure EnMS effectiveness and demonstrate energy performance improvement, as well as that required by the guidance of the 50001 Ready Navigator. We have processes in place for creating, updating and controlling our documented information.

Think Missouri…
The "Show Me" state

Task 16: Key Terms

Document:

Information that guides action or communicates expectations

Record:

Captures activities performed as evidence of the activity

3.3.5
documented information
information required to be controlled and maintained by an organization (3.1.1) and the medium on which it is contained

Task 16: Documentation

- ISO 50001 tells you what needs to be documented
- The new term is:
  - DOCUMENTED INFORMATION

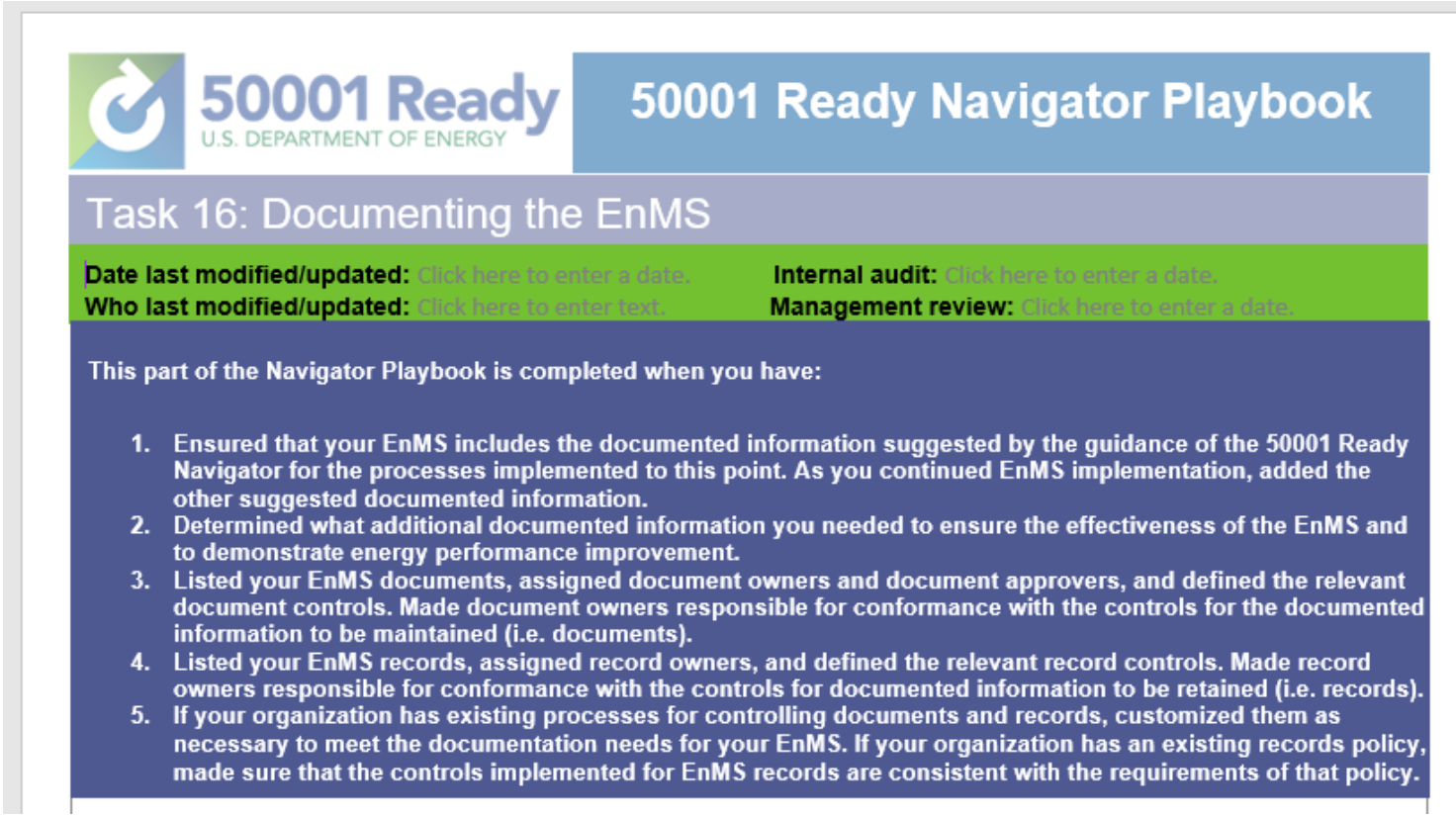
This appears 18 times in the ISO 50001 standard:

...shall retain documented information (see 7.5)...

Task 16: Playbook

Activity

- Look at Task 16 in 50001 Ready
- Look at the Task 16 Playbook



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50001 Ready Navigator Playbook

Task 16: Documenting the EnMS

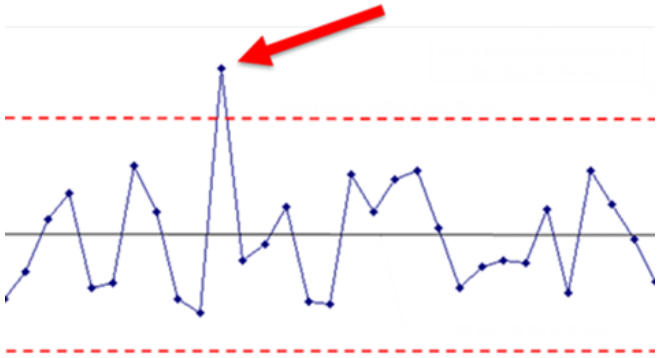
Date last modified/updated: Click here to enter a date. **Internal audit:** Click here to enter a date.
Who last modified/updated: Click here to enter text. **Management review:** Click here to enter a date.

This part of the Navigator Playbook is completed when you have:

1. **Ensured that your EnMS includes the documented information suggested by the guidance of the 50001 Ready Navigator for the processes implemented to this point. As you continued EnMS implementation, added the other suggested documented information.**
2. **Determined what additional documented information you needed to ensure the effectiveness of the EnMS and to demonstrate energy performance improvement.**
3. **Listed your EnMS documents, assigned document owners and document approvers, and defined the relevant document controls. Made document owners responsible for conformance with the controls for the documented information to be maintained (i.e. documents).**
4. **Listed your EnMS records, assigned record owners, and defined the relevant record controls. Made record owners responsible for conformance with the controls for documented information to be retained (i.e. records).**
5. **If your organization has existing processes for controlling documents and records, customized them as necessary to meet the documentation needs for your EnMS. If your organization has an existing records policy, made sure that the controls implemented for EnMS records are consistent with the requirements of that policy.**

Operation (3)

Operate, maintain, design and procure to optimize energy performance



Do I have good operational and maintenance controls for my SEUs and action plans?
Do my operators know what to do when energy expectations are not met?
Are design and procurement teams are engaged?

Task 17: Operational Controls

Task 17: We plan and control the processes related to our **SEUs** and **action plans** and set operation and maintenance criteria where there are risks of significant deviations in energy performance.

We operate the **SEU** and **action-plan** related processes in accordance with the criteria and communicate the criteria to relevant personnel.

We control planned changes, along with outsourced processes related to SEUs.

Task 17: Operational Control, Definitions

Operational Controls are all the procedures, tools and guidelines that promote the efficient and uninterrupted functioning of critical equipment.
Examples include:

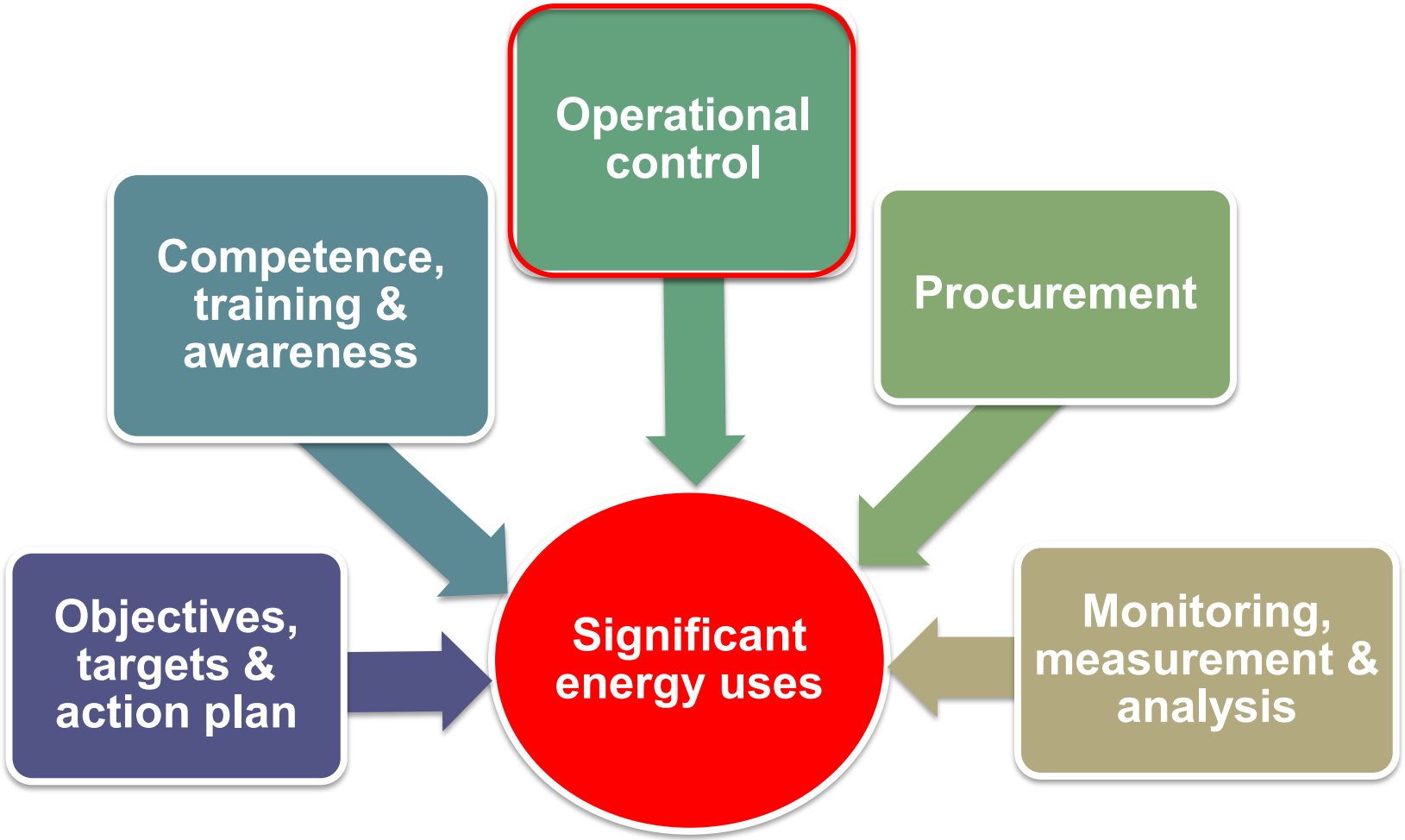
Criteria - parameters

- Operational
  - Temperature
  - Pressure
  - Amperage
- Maintenance
  - Filter replacement
  - Lubrication
  - Vibration checks

Procedural- instructions

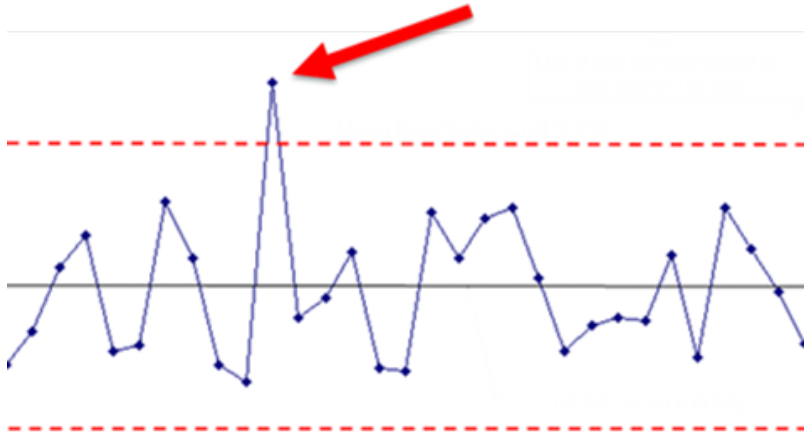
- Operational
  - Oven start up/shutdown
  - Paint booth down draft
  - Peak shaving
- Maintenance
  - Leak repair
  - Cleaning
  - Equipment tuning/calibration
  - PM Schedule

Task 17: Connection to SEUs



Task 17: Determining Appropriate Controls

1. Document all current official operating practices for each SEU.
2. Map processes that use SEUs or have related action plans for improvement.
3. Identify opportunities for streamlining SEU controls.
4. Operational and maintenance controls PREVENT significant deviations in energy performance in SEUs

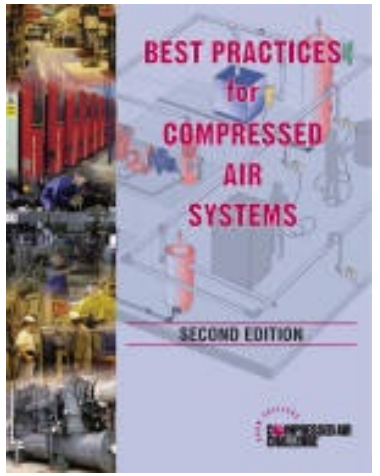


Task 17: Developing Criteria

Sources of Criteria:

- Manufacturer's recommendations
- System personnel or operational manuals, including automated controls
- Minimum process or system requirements
- Service personnel suggested operating/maintenance practices
- Statistical process control
- Benchmarking performance of similar equipment
- Guidance from energy system experts (can be in energy assessments)
- Internal expert's suggestions
- Past issues or problems

TRAINING · EDUCATION · EFFICIENCY
COMPRESSED AIR CHALLENGE



Task 17: Operational Criteria

Operating criteria:

- ✓ Occupancy time
- ✓ Temperature
- ✓ Pressure
- ✓ Humidity
- ✓ Control schemes
- ✓ Set points
- ✓ Others

Task 17: Maintenance-Definitions

- The primary purpose of maintenance has traditionally been to maintain reliability & availability.
- However, effective equipment maintenance also enhances energy efficiency.
- Reactive maintenance will undoubtedly waste energy
- The cost of the energy will often be more than the cost of the maintenance (also a different budget!)
- All significant energy users need to be maintained correctly
- Applies equally to external service contracts

Task 17: Maintenance Criteria & Factors

Maintenance criteria:

- Filters
- Lubrication
- Tune-ups, adjustments

Maintenance factors:

- Operating schedules
- Inspection methods & intervals
- Start up & shut down frequency
- Severity of service

Task 17: Document Criteria, Example

SEU	Parameter	Eng Units	Upper Limit	Lower Limit	Measuring Instrument	Routine Calibration	Note
Boilers	Total Dissolved Solids	ppm	3800	3400	TDS001	Y	
Boilers	Boiler Pressure	bar	10	9	PT123	Y	
Boilers	Exhaust Oxygen	% O2	3.5	2	Portable 123	Y	
Boilers	Stack Temperature	Deg C	300	N.A.	TT124	Y	Varies with firing rate

Tasks 17: Communication of Controls

Identify SEU affected personnel, then….

- On-the-job training
- Work instructions or operating procedures
- Classroom training
- Posted list of specified settings
- Logbooks
- Email in corporate intranets

Task 17: Operational Control Implementation

Procedure Based:

- Procedures or work instructions
- Equipment logbooks
- PM Schedule
- Equipment operating procedures
- Checklists
- Bulletin board postings

Technology Based:

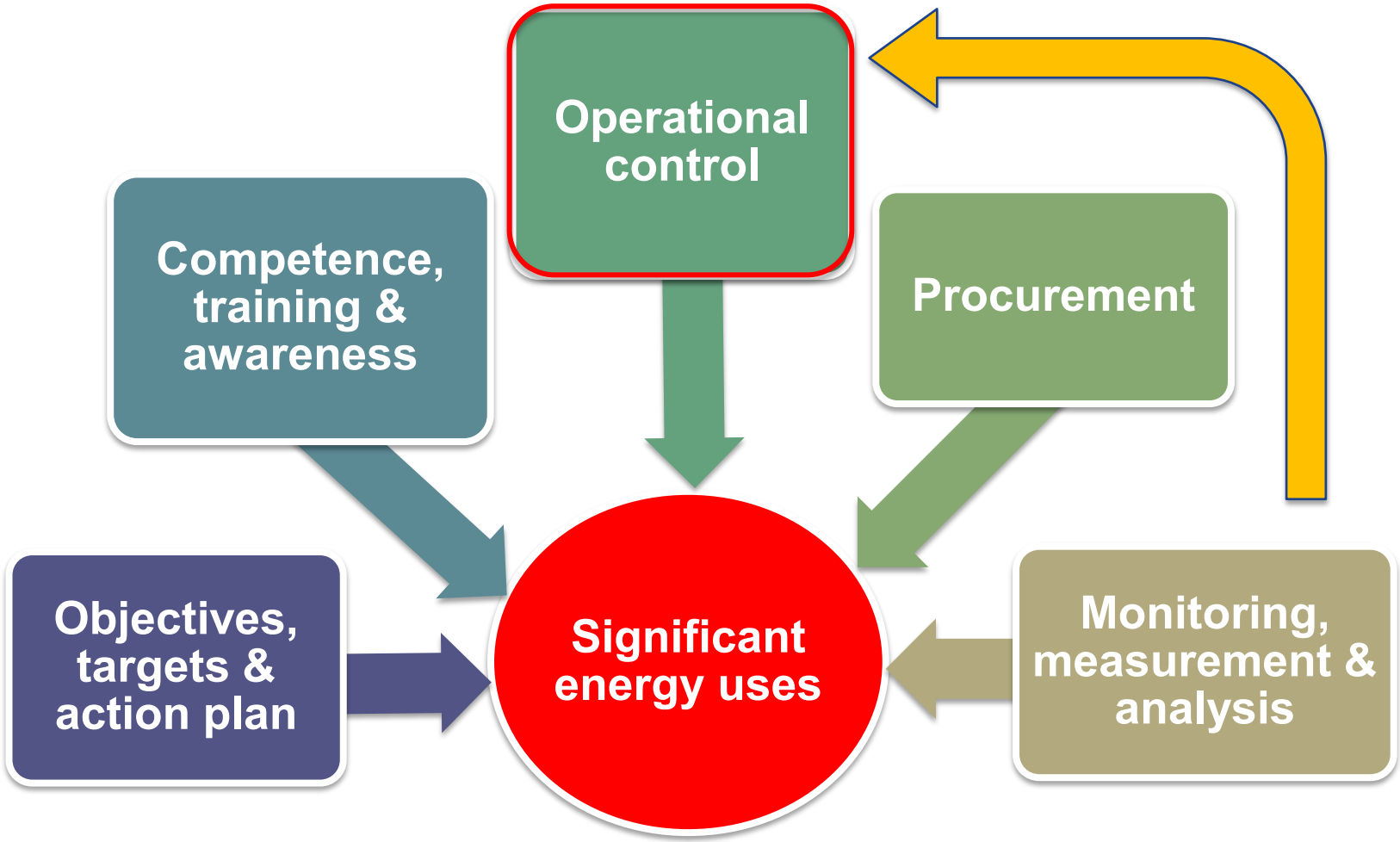
- Control systems/HMIs
- Alarm/alert systems
- Computer automated activities
- Preventive maintenance system

Training Based:

- Maintenance training
- Operations training
- Contractor training
- Better Plants INPLTs

You may already have many operational controls in place – if so, leverage them for energy management!

Task 17: Connections to MM&A

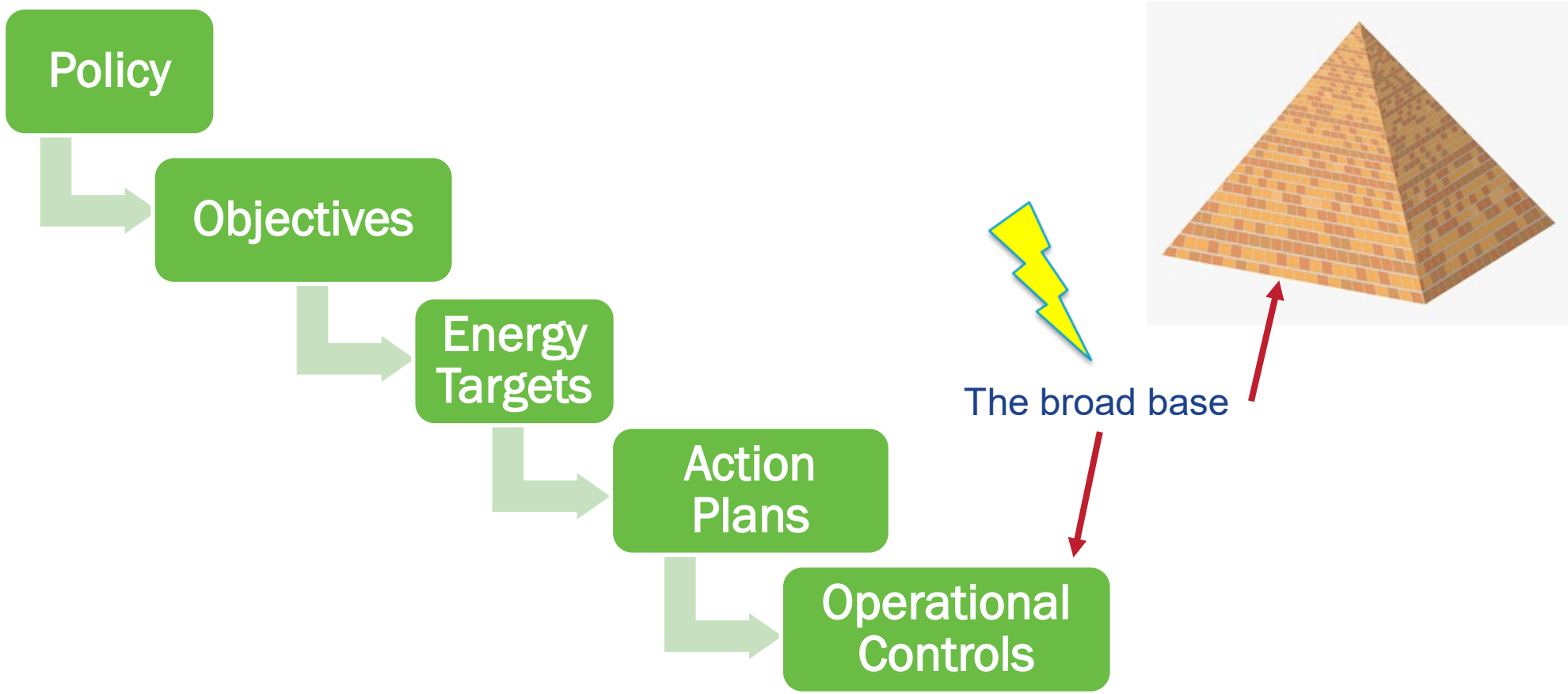


Task 17: Barriers to Effective Operational Controls

- Implementing controls that are not easy to use, understand or communicate (controls not user-friendly)
- Forgetting to include maintenance criteria in addition to operating criteria
- Infrequent communication of operational controls – need to tell employees and contractors
- Not checking control effectiveness regularly
- Failing to improve ineffective controls
- Cultural – getting staff accustomed to doing something new

Tasks 8-13 +17: The Big Picture

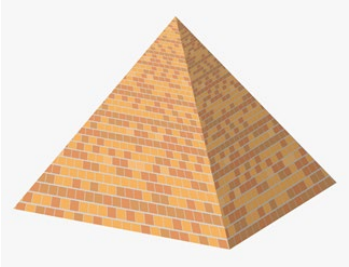
- Building the energy success pyramid starts with a wide base of small actions that build to the completion of energy policy



Polling Question 4

Polling Question

4) Thinking about the energy success pyramid on the previous slide, how would you rate the current strength of your organization's pyramid?



A. On solid rock.
B. On solid rock but still a work in progress.
C. We are still working on the foundation.
D. We have a long, long way to go.
E. I do not know where our organization is with respect to our energy success pyramid.

Task 17: Playbook

Activity

- Look at Task 17 in 50001 Ready
- Look at the Task 17 Playbook

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50001 Ready Navigator Playbook

Task 17: Operational Controls

Date last modified/updated: Click here to enter a date.
Who last modified/updated: Click here to enter text.
Internal audit: Click here to enter a date.
Management review: Click here to enter a date.

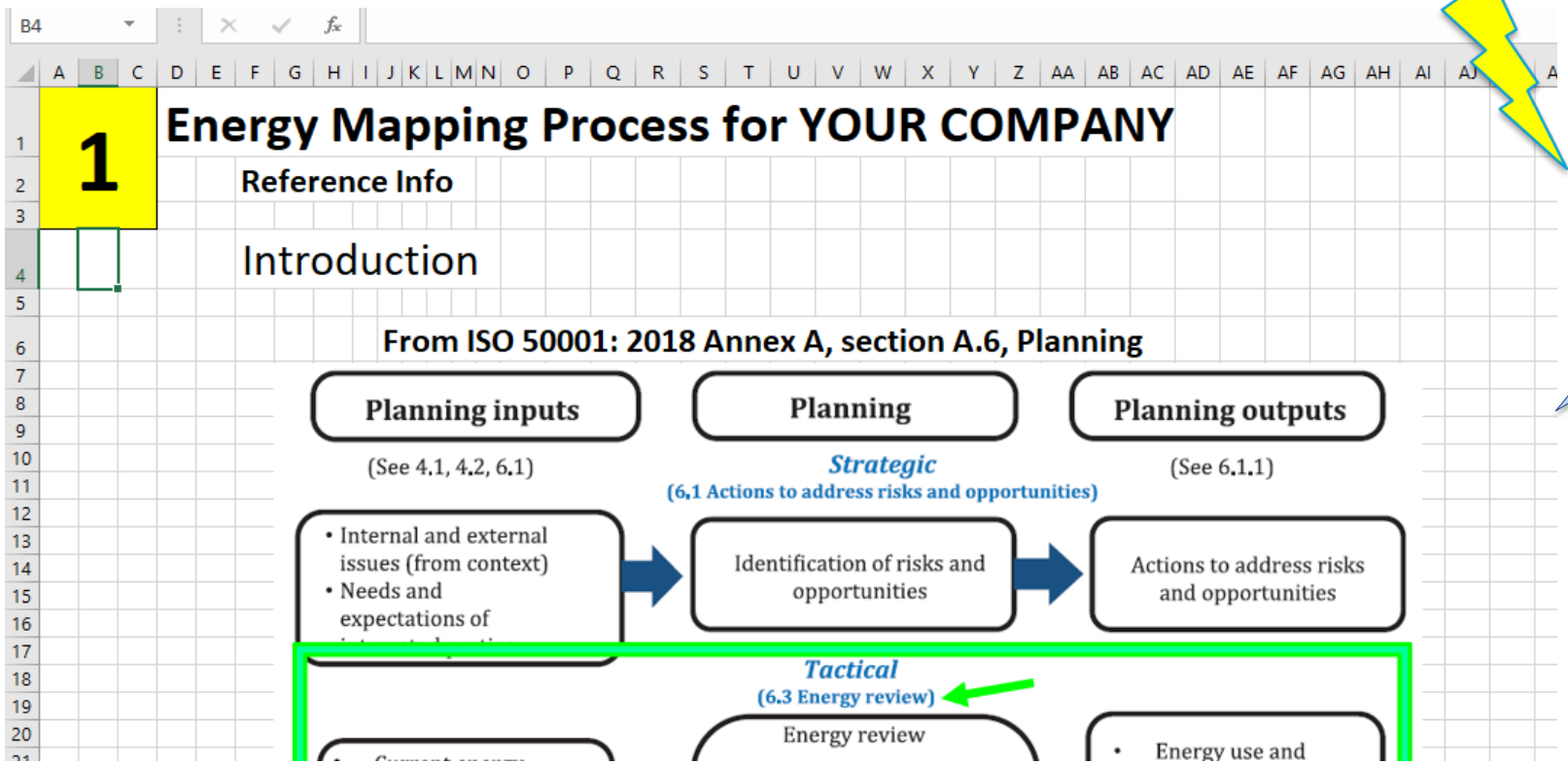
This part of the Navigator Playbook is completed when you have:

1. Created a significant energy use operating criteria worksheet and operational controls checklist to determine and set the required criteria and controls for each significant energy use.
2. Ensured critical factors affecting energy performance are known, communicated to responsible personnel.
3. Ensured that the operational and maintenance control sections of your action plans have been completed and implemented.
4. Operated and maintained facilities, equipment, systems, or processes associated with your SEUs to meet the determined criteria.
5. Established processes to control planned changes impacting operational and maintenance criteria or controls.
6. Controlled outsourced SEUs or processes related to SEUs.

Task 17: Operational Controls Worksheet

Activity

- Review the tabs of the Energy Mapping Template Tool



TAB 10 provides an Operational Controls Worksheet.

Task 18: Energy Considerations in Design

Task 18: We consider energy performance improvement opportunities and operational controls when designing new, modified, or renovated facilities, equipment, systems and processes.

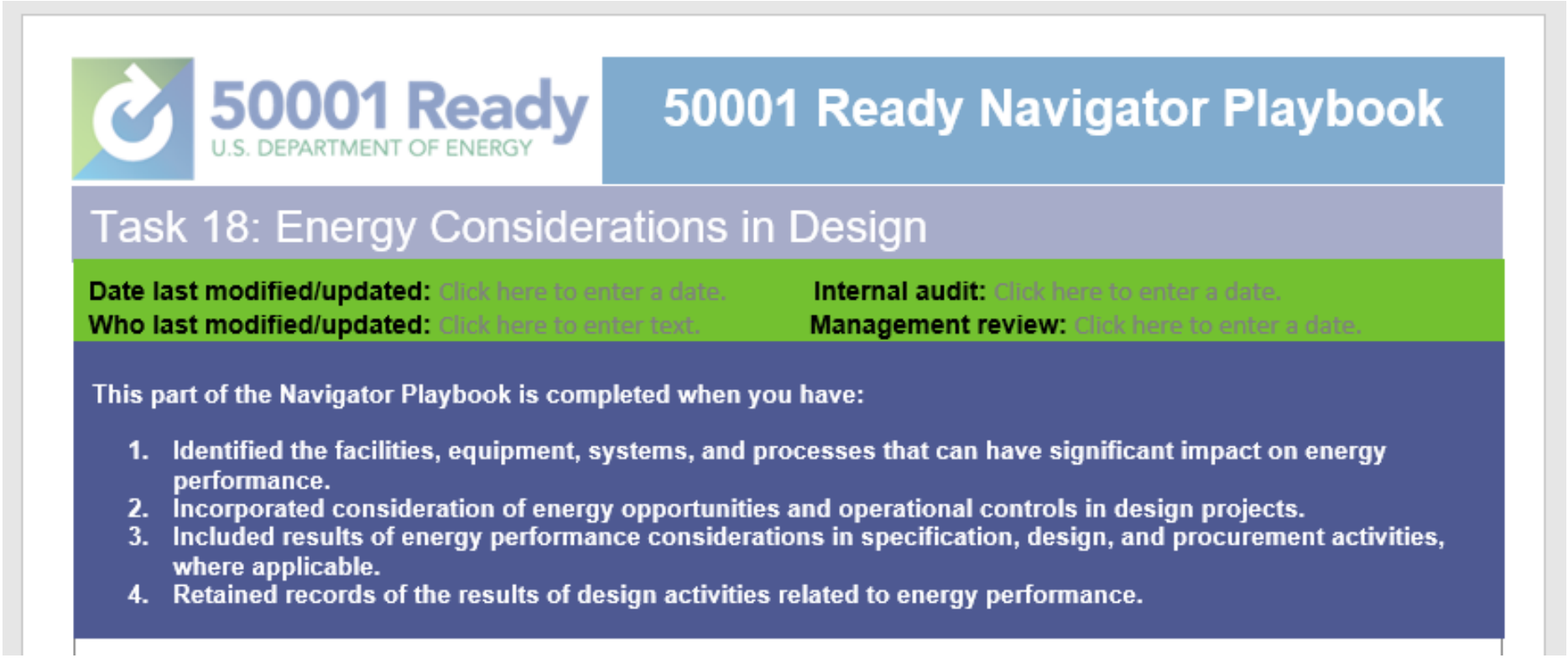
Task 18: Consideration in Design

- Consider energy performance improvement and operations in the design of new, modified and renovated facilities over the lifetime
- Design the facility to be efficient right from the start and ongoing
- Include these items in the design specifications that are sent out for quote

Task 18: Playbook

Activity

- Look at Task 18 in 50001 Ready
- Look at the Task 18 Playbook



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Task 18: Energy Considerations in Design

Date last modified/updated: Click here to enter a date.
Who last modified/updated: Click here to enter text.
Internal audit: Click here to enter a date.
Management review: Click here to enter a date.

This part of the Navigator Playbook is completed when you have:

1. Identified the facilities, equipment, systems, and processes that can have significant impact on energy performance.
2. Incorporated consideration of energy opportunities and operational controls in design projects.
3. Included results of energy performance considerations in specification, design, and procurement activities, where applicable.
4. Retained records of the results of design activities related to energy performance.

Task 19: Energy Considerations in Procurement

Task 19: We establish energy performance criteria spanning the operating life for purchases affecting energy performance, inform suppliers that this is a factor in procurement, and define and use specifications for energy supply purchases.

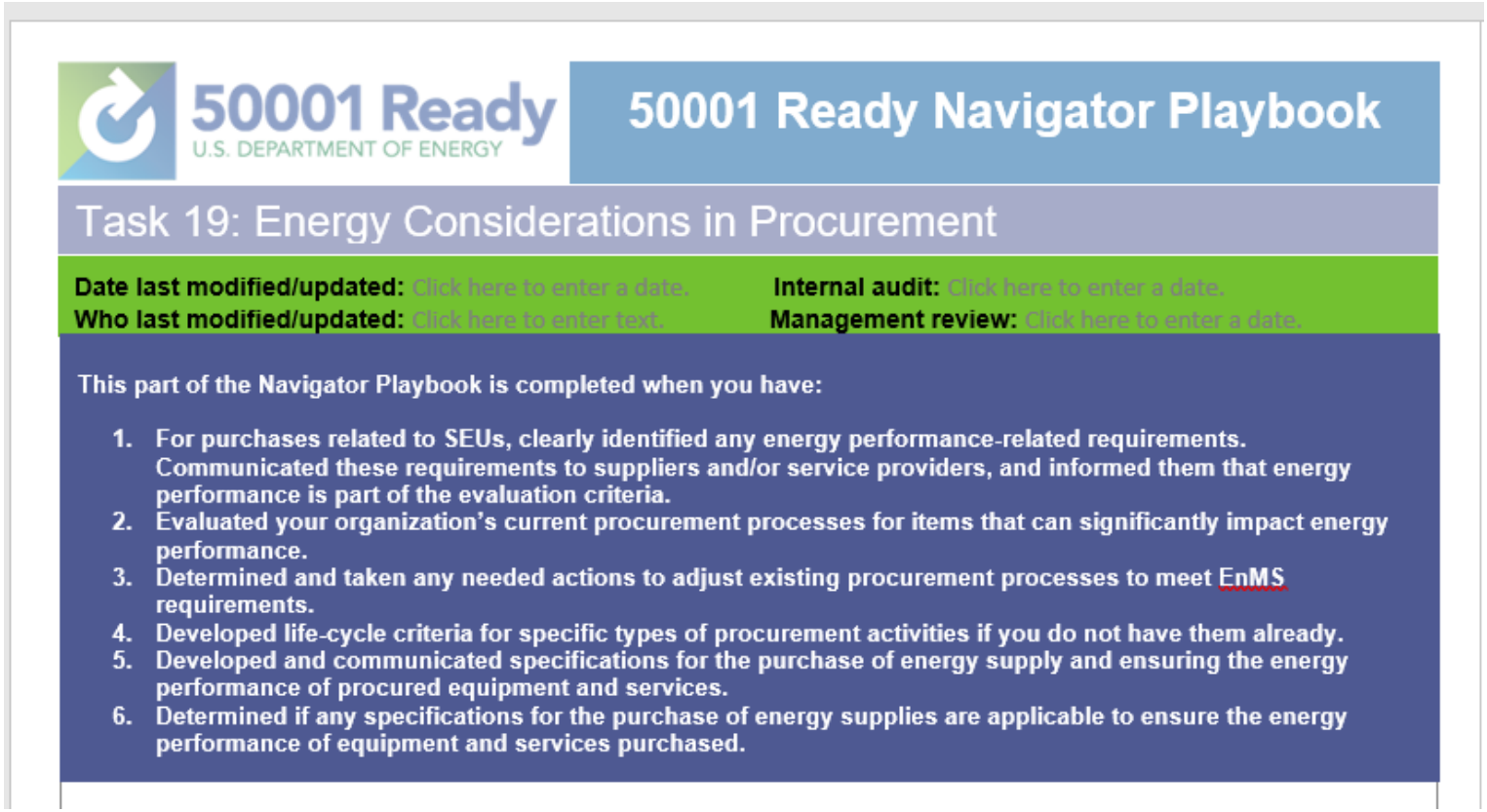
Task 19: Specific Actions

- Inform suppliers of energy performance as an evaluation factor for SEU-related purchases
- Establish operating lifetime energy performance criteria for purchases that can significantly affect energy performance
- Develop documented specifications for:
  - the purchase of energy supply
  - ensuring the energy performance of procured equipment and services

Task 19: Playbook

Activity

- Look at Task 19 in 50001 Ready
- Look at the Task 19 Playbook



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Task 19: Energy Considerations in Procurement

Date last modified/updated: Click here to enter a date.
Who last modified/updated: Click here to enter text.
Internal audit: Click here to enter a date.
Management review: Click here to enter a date.

This part of the Navigator Playbook is completed when you have:

1. For purchases related to SEUs, clearly identified any energy performance-related requirements. Communicated these requirements to suppliers and/or service providers, and informed them that energy performance is part of the evaluation criteria.
2. Evaluated your organization's current procurement processes for items that can significantly impact energy performance.
3. Determined and taken any needed actions to adjust existing procurement processes to meet EnMS requirements.
4. Developed life-cycle criteria for specific types of procurement activities if you do not have them already.
5. Developed and communicated specifications for the purchase of energy supply and ensuring the energy performance of procured equipment and services.
6. Determined if any specifications for the purchase of energy supplies are applicable to ensure the energy performance of equipment and services purchased.

Training Schedule & Preparations
Kahoot Quiz Game
Q&A

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50001 Ready Navigator Tasks: Next Session in RED

Context of the Organization	Leadership	Planning	Support	Operation	Performance Evaluation	Improvement
1. An EnMS and your Organization 2. People and Legal Requirements 3. Scope and Boundaries	4. Management Commitment 5. Energy Policy 6. Energy Team and Resources	7. Risks to EnMS Success 8. Energy Data Collection and Analysis 9. Significant Energy Uses 10. Improvement Opportunities 11. Energy Performance Indicators (EnPIs) and Baselines (EnBs) 12. Objectives and Targets 13. Action Plans for Continual Improvement	14. Competence and Training 15. Awareness and Communication 16. Documenting the EnMS	17. Operational Controls 18. Energy Considerations in Design 19. Energy Considerations in Procurement	20. Monitoring and Measurement of the EnMS 21. Monitoring and Measurement of Energy Performance Improvement 22. Internal Audit 23. Management Review	24. Corrective Action 25. Continual Improvement

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Training Schedule: By Session

1. An Overview – February 17, Done
2. Laying the Foundation of 50001 – February 24, Done
3. Where does all the Energy Go? – March 3, Done
4. Sorting out the Energy Data – March 10, Done
5. Engaging Other Functions – **Today-March 17** ☘
6. Evaluating Performance – **Next-March 24**
7. Ensuring Continual Improvement – March 31
8. Wrap Up and Next Steps – April 7

Always on Tuesdays @ 10:00 a.m. – 12:30 p.m. Eastern

Preparation for Session SIX

- If desired, purchase the ISO 50001: 2018 standard
- Set up and use your 50001 Ready account, if not done yet
- Prepare for Session SIX:
  - Review the “Getting it Done” tab for tasks 20 & 21 in 50001 Ready
  - Do you currently evaluate your energy performance, year over year? How? (20, 21)
  - Are significant deviations from your planned energy performance investigated (20, 21)?
  - Is monitoring and measuring to evaluate your EnMS and energy performance well defined (20,21)?

50001 Ready - Resources

- 50001 Ready Program
  - https://www.energy.gov/eere/amo/50001-ready-program
- 50001 Ready Navigator
  - https://navigator.lbl.gov/
- Energy Footprint Tool
  - https://www.energy.gov/eere/amo/downloads/energy-footprint-tool
- EnPI Lite Tool
  - https://enpilite.lbl.gov/
- 50001 Ready at Better Building
  - https://betterbuildingssolutioncenter.energy.gov/better-plants/software-tools

Polling Question 5

Polling Question

5) Thinking about the homework questionnaires, the slide decks, the recording links, the 50001 Ready navigator, the example playbooks, the energy map, and other resources, how do you feel these have helped you prepare and get the most out of these training sessions?

A. Excellent help and I am using them all.
B. Very good and I use most of these.
C. Good resources, but I have not had much time to use them.
D. I have not used these resources.

Polling Question 6

Polling Question

6) After listening to today's webinar session FIVE, and now having covered tasks 1-19, how do you feel about 50001 Ready as a resource to help you with your energy management plans:
   A. Still overwhelmed.
   B. Cautiously optimistic.
   C. Very encouraged.
   D. Confident - Ready to get Ready.

And now, our Kahoot Quiz Review Game

Question and Answer Time

Thank You!

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