



When Recognition Matters



EXAM PREPARATION GUIDE

PECB Certified ISO 55001 Lead Implementer

The objective of the “**PECB Certified ISO 55001 Lead Implementer**” exam is to ensure that the candidate has acquired the necessary knowledge and skills to support an organization in establishing, implementing, managing, and maintaining an Asset Management System (AMS) based on the ISO 55001 standard.

The ISO 55001 Lead Implementer exam is intended for:

- Managers or consultants involved in Asset Management
- Expert advisors seeking to master the implementation of an Asset Management System
- Individuals responsible for maintaining conformance with AMS requirements
- AMS team members

The exam covers the following competency domains:

- **Domain 1:** Fundamental principles and concepts of an Asset Management System
- **Domain 2:** Asset Management Systems (AMS)
- **Domain 3:** Planning an AMS implementation based on ISO 55001
- **Domain 4:** Implementing an AMS based on ISO 55001
- **Domain 5:** Performance evaluation of an AMS based on ISO 55001
- **Domain 6:** Continual improvement of an AMS based on ISO 55001
- **Domain 7:** Preparing for an AMS certification audit

The content of the exam is divided as follows:

Domain 1: Fundamental principles and concepts of an Asset Management System

Main objective: Ensure that the ISO 55001 Lead Implementer candidate understands, and is able to interpret and illustrate the ISO 55001 concepts, principles, and requirements.

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Ability to understand and explain the operations of the ISO organization and the development of asset management standard. 2. Ability to explain and illustrate the main concepts of asset management. 3. Ability to understand and distinguish different types of assets. 4. Ability to understand the life cycle of an asset. 5. Ability to interpret the advantages of effective asset management system in an organization. 6. Ability to understand the main asset management objectives. 7. Ability to understand the asset management fundamentals. 8. Ability to understand and distinguish the relations of asset management with external aspects. 	<ol style="list-style-type: none"> 1. Knowledge of ISO principles and their application. 2. Knowledge of the main standards related to asset management. 3. Knowledge of the main concepts and terminology as described in ISO 55001. 4. Knowledge of the main classification of assets. 5. Knowledge of the types of assets. 6. Knowledge of the critical assets. 7. Knowledge of the activities related to an asset life cycle. 8. Knowledge of the main advantages and benefits that an organization can gain by an effective implementation of an asset management system. 9. Knowledge of the asset management objectives and their application. 10. Knowledge of the fundamentals on which the asset management is based. 11. Knowledge of the relationship between the asset management and asset management system. 12. Knowledge of the relationship between the asset management and maintenance management.

Domain 2: Asset Management System (AMS)

Main objective: Ensure that the ISO 55001 Lead Implementer candidate can understand, interpret and provide guidance on how to implement and manage Asset Management System requirements based on the ISO 55001.

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Ability to understand and explain the components of an asset management system based on ISO 55001 and its principal processes. 2. Ability to interpret and analyze ISO 55001 requirements. 3. Ability to understand the context of an organization when designing the asset management system. 4. Ability to define the scope of the AMS. 5. Ability to understand the establishment of an asset management policy. 6. Ability to understand and plan appropriate AMS processes and activities. 7. Ability to identify and understand risks related to asset management. 8. Ability to identify the necessary resources for the establishment, implementation, maintenance and continual improvement of the AMS. 9. Ability to document the AMS. 10. Ability to follow continual improvement of the AMS. 	<ol style="list-style-type: none"> 1. Knowledge of the concepts, principles and terminology related to management systems and the "Plan-Do-Check-Act" (PDCA) model. 2. Knowledge of the principal characteristics of an integrated management system. 3. Knowledge of the ISO 55001 requirements presented in clauses 4 to 10. 4. Knowledge of the techniques to understand an organization's external and internal context. 5. Knowledge on the ISO 55001 recommendations on how to define the AMS scope. 6. Knowledge of the asset management policy characteristics as provided by ISO 55001. 7. Knowledge of the appropriate planning of AMS processes and activities as presented by ISO 55001. 8. Knowledge of the controls and its main classification. 9. Knowledge of the processes included in asset management controls. 10. Knowledge of an effective asset risk management process. 11. Knowledge on the allocation of appropriate resources needed for the AMS. 12. General knowledge on the AMS documentation. 13. Knowledge on how to monitor and review the AMS. 14. Knowledge of the input and output elements when reviewing AMS. 15. Knowledge of the AMS continual improvement. 16. Knowledge of the characteristics and best practices to manage the AMS continual improvement.

Domain 3: Planning an AMS implementation based on ISO 55001

Main objective: Ensure that the ISO 55001 Lead Implementer candidate can plan the implementation of an AMS based on ISO 55001.

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Ability to manage an AMS implementation project by following the best practices. 2. Ability to collect, analyze, and interpret the necessary information to plan the AMS implementation. 3. Ability to observe, analyze, and interpret the internal and external environment of an organization. 4. Ability to perform a gap analysis and clarify the Asset Management objectives of an organization. 5. Ability to state and justify an AMS scope adapted to the organization's specific AMS objectives. 6. Ability to develop an AMS policy and procedures. 7. Ability to perform risk assessment related to the AMS. 	<ol style="list-style-type: none"> 1. Knowledge of principal approaches and the methodology framework employed to implement an AMS. 2. Knowledge of an organization's internal and external environment. 3. Knowledge of the main stakeholders related to an organization's AM, and their characteristics. 4. Knowledge of the techniques used to gather information on an organization and perform a gap analysis of the management system. 5. Knowledge of the AMS project team, determining the needed resources, and obtaining formal approval from the management. 6. Knowledge of the characteristics of an AMS scope in terms of organizational, physical, and AMS boundaries. 7. Knowledge of the techniques and best practices to draft an Asset Management policy. 8. Knowledge of the different approaches and main methodology characteristics to perform a risk assessment.

Domain 4: Implementing an AMS based on ISO 55001

Main objective: Ensure that an ISO 55001 Lead Implementer candidate can implement the processes of an AMS based on ISO 55001 requirements.

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Ability to manage, estimate, and monitor resources regarding the AMS implementation. 2. Ability to understand and analyze the needs, and provide guidance on the attribution of roles and responsibilities in the context of the AMS implementation and management. 3. Ability to define the documentation, and record management processes needed to support the implementation and operations of an AMS. 4. Ability to define and design processes and properly document them. 5. Ability to define and implement appropriate Asset Management training, awareness and communication plans. 6. Ability to establish an AMS communication plan to assist in the understanding of an organization's AMS issues, policies, performance, and providing inputs/suggestions for improving the AMS performance. 	<ol style="list-style-type: none"> 1. Knowledge of resource management in AMS implementation processes. 2. Knowledge in assessing and building the needed capacities for a successful AMS implementation. 3. Knowledge of the roles and responsibilities of the key stakeholders during and after the implementation and operation of an AMS. 4. Knowledge of the main organizational structures applicable for an organization to manage an Asset Management System. 5. Knowledge of the best practices on documentation and record management processes and the documentation management life cycle. 6. Knowledge of the characteristics and the differences between the different documents related to an AMS policy, procedure, guideline, standard, baseline, worksheets, etc. 7. Knowledge of implementing controls, process techniques, and best practices. 8. Knowledge of the characteristics and the best practices to implement Asset Management training, awareness program and communication process. 9. Knowledge of the communication objectives and activities, to enhance the shareholder's support and confidence.

Domain 5: Performance evaluation of an AMS based on ISO 55001

Main objective: Ensure that an ISO 55001 Lead Implementer candidate can evaluate, monitor and measure the performance of an AMS based on ISO 55001.

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Ability to monitor and evaluate the effectiveness of an AMS. 2. Ability to verify the extent to which the identified AMS requirements have been met. 3. Ability to define and implement an internal audit program for ISO 55001. 4. Ability to perform regular and methodical reviews regarding the suitability, adequacy, effectiveness, and efficiency of an AMS based on the policies and objectives of the organization. 5. Ability to define and implement a management review process and counsel the management in this regard. 	<ol style="list-style-type: none"> 1. Knowledge of the techniques and best practices to monitor the effectiveness of an AMS. 2. Knowledge of the main concepts and components related to an Asset Management Measurement Program measures, attributes, indicators, and dashboards. 3. Knowledge of the main concepts and components related to the implementation and operation of an AMS internal audit program. 4. Knowledge of the differences between the concepts of major and minor nonconformities. 5. Knowledge of the guidelines and best practices to write a nonconformity report. 6. Knowledge of the best practices on how to perform management reviews.

Domain 6: Continual improvement of an AMS based on ISO 55001

Main objective: Ensure that an ISO 55001 Lead Implementer candidate can continually improve the effectiveness of an AMS based on ISO 55001.

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Ability to continually improve the effectiveness of the AMS. 2. Ability to ensure that the AMS objectives are kept aligned with the business objectives. 3. Ability to continually update the documentation and records. 4. Ability to document the improvements. 	<ol style="list-style-type: none"> 1. Knowledge of the techniques and best practices to continually improve the effectiveness of an AMS. 2. Knowledge of ensuring that the plans and procedures are continuously up-to-date. 3. Knowledge of the benefits of an AMS continual improvement. 4. Knowledge of the ways of continually updating the documentation and records. 5. Knowledge of the methods of documenting the improvements.

Domain 7: Preparing for an AMS certification audit

Main objective: Ensure that the ISO 55001 Lead Implementer candidate can prepare and assist an organization for the certification of an AMS against the ISO 55001 standard.

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Ability to understand the main steps processes, and activities related to an ISO 55001 certification audit. 2. Ability to understand, explain, and illustrate the audit evidence approach in the context of an ISO 55001 audit. 3. Ability to counsel an organization in identifying and selecting a certification body that meets their needs. 4. Ability to review the readiness of an organization for an ISO 55001 certification audit. 5. Ability to coach and prepare an organization's personnel for an ISO 55001 certification audit. 6. Ability to argue and challenge the audit findings and conclusions with external auditors. 	<ol style="list-style-type: none"> 1. Knowledge of the evidence-based approach to an audit. 2. Knowledge of the differences between Stage 1 and Stage 2 audits. 3. Knowledge of Stage 1 audit requirements, steps, and activities. 4. Knowledge of the documentation review criteria. 5. Knowledge of Stage 2 audit requirements, steps, and activities. 6. Knowledge of follow-up audit requirements, steps, and activities. 7. Knowledge of surveillance audits and recertification audit requirements, steps, and activities. 8. Knowledge of the requirements, guidelines, and best practices to develop action plans following an ISO 55001 certification audit.

Based on these 7 domains and their relevance, 12 questions are included in the exam, as summarized in the following table:

		Level of Understanding (Cognitive/Taxonomy) Required						
		Points per question	Questions that measure comprehension, application and analysis	Questions that measure synthesis and evaluation	Number of questions per competency domain	% of test devoted to each competency domain	Number of points per competency domain	% of points per competency domain
Competency/Domains	Fundamental principles and concepts of an Asset Management System	5	X		1	8.33	5	6.67
	Asset Management Systems (AMS)	5	X		2	16.66	10	13.34
		5	X					
	Planning an AMS implementation based on ISO 55001	5	X		1	8.33	5	6.67
	Implementing an AMS based on ISO 55001	5	X		4	33.32	25	33.35
		5	X					
		10		X				
		5		X				
	Performance evaluation of an AMS based on ISO 55001	10		X	2	16.66	15	20.01
		5		X				
	Continual improvement of an AMS based on ISO 55001	5		X	1	8.33	5	6.67
	Preparing for an AMS certification audit	10		X	1	8.33	10	13.34
Total points		75	6	6				
Number of questions per level of understanding								
% of Test devoted to each level of understanding (cognitive/taxonomy)								

The passing score is established at **70%**.

After successfully passing the exam, candidates will be able to apply for the “PECB Certified ISO 55001 Lead Implementer” credential, depending on their level of experience.

TAKE A CERTIFICATION EXAM

Candidates will be required to arrive at least thirty (30) minutes before the start of the certification exam. Candidates arriving late will not be given compensatory time for the late arrival and may be denied entry to the exam.

All candidates are required to present a valid identity card such as a national ID card, driver's license, or passport to the invigilator.

The exam duration is three (3) hours. Non-native speakers receive an additional twenty (30) minutes.

The exam contains essay type questions: This type of format was selected as a means of determining whether an examinee can clearly answer training related questions, by assessing problem solving techniques and formulating arguments supported with reasoning and evidence. The exam is set to be “open book”, and does not measure the recall of data or information. The examination evaluates the candidates' comprehension, application and analyzing skills. Therefore, candidates will have to justify their answers by providing concrete explanations as to demonstrate that they have been capable of understanding the training concepts. At the end of this document, you will find samples of exam questions and potential answers.

As the exam is “open book”; candidates are authorized to use:

- A copy of the ISO 55001 standard,
- Course notes from the Participant Handout,
- Any personal notes made by the student during the course, and
- A hard copy dictionary.

The use of electronic devices, such as laptops, cell phones, etc., is not allowed.

All attempts to copy, collude or otherwise cheat during the exam will automatically lead to the failure of the exam.

PECB exams are available in English. For availability of the exam in a language other than English, please contact examination@pecb.com.

RECEIVE YOUR EXAM RESULTS

Results will be communicated by email within a period of 6 to 8 weeks from your examination date. The candidate will be provided with only two possible examination results: pass or fail, rather than an exact grade.

Candidates who successfully complete the examination will be able to apply for a certified scheme.

In case of a failure, the results will be accompanied with the list of domains where the candidate failed to fully answer the question. This can help the candidate better prepare for a retake exam.

Candidates who disagree with the exam results may file a complaint by writing to examination@pecb.com. For more information, please refer to www.pecb.com.

EXAM RETAKE POLICY

There is no limit on the number of times a candidate may retake an exam. However, there are some limitations in terms of the allowed time-frame in between exam retakes, such as:

- If a candidate does not pass the exam on the first attempt, he/she must wait 15 days for the next attempt (1st retake). Retake fee applies.

Note: *Students, who have completed the full training but failed the written exam, are eligible to retake the exam once for free within a 12 month period from the initial date of the exam.*

- If a candidate does not pass the exam on the second attempt, he/she must wait 3 months (from the initial date of the exam) for the next attempt (2nd retake). Retake fee applies.
- If a candidate does not pass the exam on the third attempt, he/she must wait 6 months (from the initial date of the exam) for the next attempt (3rd retake). Retake fee applies.

After the fourth attempt, a waiting period of 12 months from the last session date is required in order for the candidate to retake the same exam. Regular fee applies.

For the candidates that fail the exam in the 2nd retake, PECB recommends to attend an official training in order to be better prepared for the exam.

To arrange exam retakes (date, time, place, costs), the candidate needs to contact the PECB partner who has initially organized the session.

Closing a Case

If an applicant does not apply for his/her certificate within three years, their case will be closed. Even though an applicant's certification period expires they have the right to reopen their case, however, PECB will no longer be responsible for any changes regarding the conditions, standards, policies, candidate handbook or exam preparation guide that were applicable before the applicant's case was closed. Applicants requesting their case to reopen must do so in writing, and pay the required fees.

EXAMINATION SECURITY

A significant component of a successful and respected professional certification credential is maintaining the security and confidentiality of the examination. PECB relies upon the ethical behavior of certificate holders and applicants to maintain the security and confidentiality of PECB examinations. When someone who holds PECB credentials reveals information about PECB examination content, he/she violates the PECB Code of Ethics. PECB will take action against individuals who violate PECB Policies and the Code of Ethics. Actions taken may include permanently barring individuals from pursuing PECB credentials and revoking certifications from those who have been awarded the credential. PECB will also pursue legal action against individuals or organizations who infringe upon its copyrights, proprietary rights, and intellectual property.

SAMPLE EXAM QUESTIONS AND POSSIBLE ANSWER

Question 1:

For each of the following clauses of the ISO 55001 standard, please provide two different examples of actions that would be acceptable to ensure the fulfillment of the respective requirement.

Example: Clause 7.3 Awareness

- *Establish an awareness program*
- *Communicate the awareness program to all employees*

Possible answer:

1. Clause 6.2.2 Planning to achieve asset management objectives

- Establish, document and maintain asset management plan(s) to achieve the AM objectives
- Establish the method and criteria for decision making and prioritization of activities and resources to achieve the organization's asset management plans and objectives

2. Clause 9.1 Monitoring, measurement, analysis and evaluation

- Establish a report on the effectiveness of the asset management system;

- Maintain documented information as evidence of the results of monitoring, measurement, analysis and evaluation

Question 2:

ISO 55001 states the importance of managing outsourced activities that can have an impact on the achievement of AM objectives. Please describe the steps that an organization should take with respect to its outsourced activities and ensure conformity to clause 8.3 of ISO 55001.

Possible answer:

- Define the processes and activities to be outsourced;
- Define the responsibilities and authorities within the organization for managing the outsourced processes and activities;
- Define the processes and scope for knowledge and information sharing between the organization and its contracted service provider(s).

In addition, the organization shall determine and document how the outsourced processes and activities will be controlled and integrated into the organization's asset management system.