



*When Recognition Matters*



# **EXAM PREPARATION GUIDE**

**PECB Certified ISO 55001 Lead Auditor**

The objective of the “PECB Certified ISO 55001 Lead Auditor” exam is to ensure that the candidate has mastered the audit concepts and techniques and is able to participate in asset management system audits based on ISO 55001 standard.

The ISO 55001 Lead Auditor exam is intended for:

- Auditors seeking to participate and lead an Asset Management System (AMS) certification audits
- Managers or consultants seeking to obtain knowledge and enhance their competency to audit an Asset Management System
- Individuals responsible in maintaining conformance to the AMS requirements
- Experts seeking to prepare for the implementation of an Asset Management System audit
- Expert advisors in Asset Management

The exam covers the following competency domains:

- **Domain 1:** Fundamental principles and concepts of an Asset Management System
- **Domain 2:** Asset Management System (AMS)
- **Domain 3:** Fundamental audit concepts and principles
- **Domain 4:** Preparation of an ISO 55001 audit
- **Domain 5:** Conducting an ISO 55001 audit
- **Domain 6:** Closing an ISO 55001 audit
- **Domain 7:** Managing an internal ISO 55001 audit programme

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 Auditor candidate can understand, interpret and illustrate the main asset management concepts related to an Asset Management System (AMS).

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

## Domain 2: Asset Management System (AMS)

**Main objective:** Ensure that the ISO 55001 Lead Auditor candidate can understand, interpret and illustrate the main concepts and components of an Asset Management System based on ISO 55001.

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

## Domain 3: Fundamental audit concepts and principles

**Main objective:** Ensure that the ISO 55001 Lead Auditor candidate understands, and is able to interpret the main audit concept and principles.

Competencies	Knowledge statements
<ol style="list-style-type: none"> <li>1. Ability to understand, explain and illustrate the application of the audit principles in the context of an ISO 55001 audit</li> <li>2. Ability to identify and judge situations that would discredit the professionalism of the auditor and the PECB code of ethics</li> <li>3. Ability to identify and evaluate ethical problems taking into account the obligations related to sponsors, auditee and law enforcement or regulatory authorities</li> <li>4. Ability to explain, illustrate and apply the audit evidence approach in the context of an ISO 55001 audit</li> <li>5. Ability to explain and compare the types and characteristics of evidence</li> <li>6. Ability to determine and justify what type of evidence and how much evidence will be required in the context of a specific AMS audit mission</li> <li>7. Ability to determine and evaluate the level of materiality and apply the risk based approach during the different phases of an ISO 55001 audit</li> <li>8. Ability to judge the appropriate level of reasonable assurance needed for a specific ISO 55001 audit mission</li> </ol>	<ol style="list-style-type: none"> <li>1. Knowledge of the main audit concepts and terminology as described in ISO 19011</li> <li>2. Knowledge of the differences between the types of audits such as first party, second party and third party audit</li> <li>3. Knowledge of the following audit principles: integrity, fair presentation, due professional care, confidentiality independence and evidence-based approach</li> <li>4. Knowledge of professional responsibility of an auditor and the PECB code of ethics</li> <li>5. Knowledge of evidence based approach in an audit</li> <li>6. Knowledge of the different types of evidences: physical, mathematical, confirmative, technical, analytical, documentary and verbal</li> <li>7. Knowledge of the quality of audit evidences (appropriate, reliable, and sufficient) and the factors that will influence them</li> <li>8. Knowledge of the risk based approach in an audit and the different types of risk related to audit activities such as: Inherent risk, control risk and detection risk</li> <li>9. Knowledge of the concept of materiality and its application in an audit</li> <li>10. Knowledge of the concept of reasonable assurance and its applicability in an audit</li> </ol>

## Domain 4: Preparation of an ISO 55001 audit

**Main objective:** Ensure that the ISO 55001 Lead Auditor candidate can prepare appropriately an AMS audit in the context of ISO 55001.

Competencies	Knowledge statements
<ol style="list-style-type: none"> <li>1. Ability to understand and explain the steps and activities to prepare an AMS audit</li> <li>2. Ability to understand and explain the roles and responsibilities of the audit team leader and audit team members</li> <li>3. Ability to understand the initial contact with the auditee</li> <li>4. Ability to determine, evaluate and confirm the audit objectives, the audit scope and the audit criteria for a specific ISO 55001 audit process</li> <li>5. Ability to do a feasibility study of an audit in the context of a specific ISO 55001 audit</li> <li>6. Ability to explain, illustrate and define the audit terms of engagement</li> </ol>	<ol style="list-style-type: none"> <li>1. Knowledge of the preparation of an audit plan</li> <li>2. Knowledge of the main responsibilities of the audit team leader and audit team members</li> <li>3. Knowledge of the competencies of an audit team</li> <li>4. Knowledge on the characteristics when selecting the audit team members</li> <li>5. Knowledge of the purposes of the initial contact with the auditee</li> <li>6. Knowledge of the definition of audit objectives, audit scope and audit criteria</li> <li>7. Knowledge of the asset management audit objectives</li> <li>8. Knowledge of the difference between the AMS scope and the audit scope</li> <li>9. Knowledge of the elements to review during the feasibility study of an audit</li> <li>10. Knowledge of the characteristics and best practices of audit terms of engagement</li> <li>11. Knowledge on the characteristics of auditing a small organization</li> </ol>

## Domain 5: Conducting an ISO 55001 audit

**Main objective:** To ensure that the ISO 55001 Lead Auditor candidate can conduct efficiently an AMS audit in the context of ISO 55001.

Competencies	Knowledge statements
<ol style="list-style-type: none"> <li>1. Ability to conduct a stage 1 audit in the context of a specific ISO 55001 audit</li> <li>2. Ability to organize and conduct the site visit in the context of a specific ISO 55001 audit</li> <li>3. Ability to understand the documentation review conditions and criteria</li> <li>4. Ability to understand the stage 2 audit objectives</li> <li>5. Ability to prepare the audit plan for stage 2 audit, containing all the necessary documents and the assignment of the auditors and technical experts for the stage</li> <li>6. Ability to conduct a stage 2 audit in the context of a specific ISO 55001 audit by taking into account the roles and responsibilities of all people involved</li> <li>7. Ability to organize and conduct the opening meeting in the context of a specific ISO 55001 audit</li> <li>8. Ability to conduct audit tests, appropriate procedures, as well as the non-conformity reports</li> <li>9. Ability to explain, illustrate and apply statistical techniques and main audit sampling methods</li> </ol>	<ol style="list-style-type: none"> <li>1. Knowledge of stage 1 audit objectives, steps and activities</li> <li>2. Knowledge of the activities and the content of the site visit during the audit</li> <li>3. Knowledge of the documentation review criteria</li> <li>4. Knowledge of the documentation requirements stated in ISO 55001</li> <li>5. Knowledge of the stage 2 audit objectives</li> <li>6. Knowledge of the stage 2 audit requirements, steps and activities</li> <li>7. Knowledge of the roles and responsibilities of guides and observers during an audit</li> <li>8. Knowledge on the best practices of communication during an audit</li> <li>9. Knowledge of the objectives of the opening meeting of an audit</li> <li>10. Knowledge of the conflict resolution techniques</li> <li>11. Knowledge of evidence collection procedures: observation, documentation review, interviews, analysis and technical verification</li> <li>12. Knowledge of evidence analysis procedures: corroboration and evaluation</li> <li>13. Knowledge of the best practices to creation of audit test plans</li> <li>14. Knowledge of main concepts, principles and statistical techniques used in an audit</li> <li>15. Knowledge of the main audit sampling methods and their characteristics</li> </ol>

## Domain 6: Closing an ISO 55001 audit

**Main objective:** To ensure that the ISO 55001 Lead Auditor candidate can conclude an AMS audit and conduct follow-up activities in the context of ISO 55001.

Competencies	Knowledge statements
<ol style="list-style-type: none"> <li>1. Ability to explain and apply the evaluation process of evidences to draft audit findings and prepare audit conclusions</li> <li>2. Ability to understand, explain and illustrate the different levels of conformity and the concept of benefits of doubt</li> <li>3. Ability to report appropriate audit observations in order to help an organization to improve an AMS in respect of audit rules and principles</li> <li>4. Ability to complete audit working documents and do a quality review of an ISO 55001 audit</li> <li>5. Ability to draft audit conclusions and present these to the management of the audited organization</li> <li>6. Ability to organize and conduct an audit closing meeting</li> <li>7. Ability to write an ISO 55001 audit report and justify a certification recommendation</li> <li>8. Ability to conduct the activities following an initial audit including the evaluation of action plans, follow up audits, surveillance audits and recertification audits</li> <li>9. Ability to make the certification decision based on the results and conclusions of the audit</li> </ol>	<ol style="list-style-type: none"> <li>1. Knowledge of the evaluation process of evidences to draft audit findings and prepare audit conclusions</li> <li>2. Knowledge of the differences and the characteristics between the concepts of conformity, minor nonconformity, major nonconformity, anomaly and observation</li> <li>3. Knowledge of the guidelines and best practices to write nonconformity report</li> <li>4. Knowledge of the guidelines and best practices to draft and report audit observation</li> <li>5. Knowledge of the principle of benefits of doubt and his application in the context of an audit</li> <li>6. Knowledge of the guidelines and best practices to complete audit working documents and do a quality review of an audit</li> <li>7. Knowledge of the guidelines and best practices to present audit findings and conclusions to management of an audited organization</li> <li>8. Knowledge of the possible recommendations that an auditor can issue in the context of a certification audit and the certification decision process</li> <li>9. Knowledge of the guidelines and best practices to evaluate action plans</li> <li>10. Knowledge of follow-up audit, surveillance audits and recertification audit requirements, steps and activities</li> <li>11. Knowledge of the conditions for modification, extension, suspension or withdrawal of a certification for an organization</li> </ol>



## Domain 7: Managing an internal ISO 55001 audit programme

**Main objective:** To ensure that the ISO 55001 Lead Auditor understands how to establish and manage an AMS audit program.

Competencies	Knowledge statements
<ol style="list-style-type: none"> <li>1. Ability to understand and explain the establishment of an audit program and the application of the PDCA model</li> <li>2. Ability to understand and explain the implementation of an ISO 55001 audit program</li> <li>3. Ability to understand and explain the responsibilities to protect the integrity, availability and confidentiality of audit records</li> <li>4. Ability to understand the requirements related to the components of the management system of an audit program as quality management, record management, complaint management</li> <li>5. Ability to understand the evaluation of the efficiency of the audit program by monitoring the performance of each auditor, each team and the entire certification body</li> <li>6. Ability to demonstrate the application of the personal attributes and behaviors associated to professional auditors</li> </ol>	<ol style="list-style-type: none"> <li>1. Knowledge of the application of the PDCA model in the management of an audit program</li> <li>2. Knowledge of requirements, guidelines and best practices regarding audit resources, procedures and policies</li> <li>3. Knowledge of the types of tools used by professional auditors</li> <li>4. Knowledge of requirements, guidelines and best practices regarding the management of audit records</li> <li>5. Knowledge of the application of the concept of continual improvement to the management of an audit program</li> <li>6. Knowledge of the concept of competency and its application to auditors</li> <li>7. Knowledge of the personal attributes and behavior of a professional auditor</li> </ol>

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		Number of questions per competency domain	% of test devoted to each competency domain	Number of points per competency domain	% of points per competency domain
		Questions that measure comprehension, application and analysis	Questions that measure synthesis and evaluation				
Competency/Domains	Fundamental principles and concepts of an Asset Management System	5	X	1	8.33	5	6.67
	Asset Management System (AMS)	5	X	2	16.66	15	20.01
		10	X				
	Fundamental audit concepts and principles	5	X	4	33.32	20	26.68
		5	X				
		5	X				
		5	X				
	Preparation of an ISO 55001 audit	5	X	1	8.33	5	6.67
	Conducting an ISO 55001 audit	5	X	2	16.66	10	13.34
		5	X				
	Closing an ISO 55001 audit	10	X	1	8.33	10	13.34
	Managing an internal ISO 55001 audit programme	10	X	1	8.33	10	13.34
Total points	75						
Number of questions per level of understanding		4	8				
% of Test devoted to each level of understanding (cognitive/taxonomy)		33.33	66.66				

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 Auditor” 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 thirty (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 exams are "open book"; candidates are allowed to use the following reference materials:

- A copy of the ISO 55001:2014 standard,
- A copy of the ISO 19011:2018 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](mailto: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 exam failure, the results will be accompanied with the list of domains in which the candidate had received low grading as to provide guidance in case of retaking the exam.

Candidates who disagree with the exam results may file a complaint by writing to [examination@pecb.com](mailto:examination@pecb.com). For more information, please refer to [www.pecb.com](http://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 (1<sup>st</sup> 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 (2<sup>nd</sup> 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 (3<sup>rd</sup> 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 2<sup>nd</sup> 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:**

Determine how you would verify the following clause. You must provide examples of evidence you would look for to have a reasonable guarantee that the clause has been effectively implemented. State at least two elements of proof for each.

Clause 9.3 Management review

### **Possible answer:**

Clause 9.3 Management review

- Documented evidence of the previous management reviews
- Documented information regarding the opportunities for continual improvement

### **Question 2:**

You have received a plan for corrective actions. Evaluate the adequacy of the proposed corrective actions. If you agree with the corrective actions, explain why. If you disagree, explain why and propose what you think would be adequate corrective actions.

**Nonconformity:** The auditor has indicated nonconformity because the applicable legal and regulatory requirements were not documented within its asset management system.

**Corrective action:** Inform the top management and initiate the documentation of the legal and regulatory requirements.

### **Possible answer:**

I agree. The documented information regarding the legal and regulatory requirements shall be available as an evidence for future references.