
jtsec
BEYOND IT SECURITY

Let’s harmonize labs competence ISO 19896

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Introduction

- One important factor in assuring comparability of the results of evaluations is to understand that the evaluation process includes the specification of both objective and subjective assurance measures.

- **Hence the competence of the individual evaluators is important when the comparability and repeatability of evaluation results are the foundation for mutual recognition**

COMMON CRITERIA

Introduction

- ISO/IEC 17025 defines some competence requirements:

- 6.2.2 The laboratory shall document the competence requirements for each function influencing the results of laboratory activities, including requirements for education, qualification, training, technical knowledge, skills and experience.

- 6.2.3 The laboratory shall ensure that the personnel have the competence to perform laboratory activities for which they are responsible and to evaluate the significance of deviations.

- 6.2.5 The laboratory shall have procedure(s) and retain records for:
- a) determining the competence requirements;
- …
- f) monitoring competence of personnel.

Introduction

- ISO/IEC 23532 further refines these requirements:
- 6.2.5.1 The evaluation laboratory shall have procedure(s) and retain records for:
- a) determining the competence requirements for personnel in **ISO/IEC 19896-3;**
- …
- f) monitoring of competence of personnel.
- NOTE **The laboratory shall review annually the competence of each evaluator for each test method the evaluator is authorized to conduct**. The evaluator's immediate supervisor, or a designee appointed by the Labooratory Director, shall conduct annually an assessment and an observation of performance for each evaluator. A record of the annual review of each evaluator shall be dated and signed by the supervisor and the employee. A description of competency review programs shall be maintained in the management system.

Introduction

- ISO/IEC 23532 further refines these requirements:
  - 6.2.6.1 Laboratory evaluator collectively shall have **knowledge or experience** for any specific t**echnologies** upon which an evaluation is conducted in **ISO/IEC 19896-3:2018**
  - 6.2.7 The evaluation laboratory shall maintain a competent administrative and technical personnel appropriate for ISO/IEC 15408-based IT security evaluations. The laboratory shall maintain **position descriptions, training records, and resumes** for responsible supervisory personnel and laboratory evaluators who influence the outcome of security evaluations.

ISO/IEC 19896 Structure

- ISO 19896 IT security techniques — Competence requirements for information security testers and evaluators —

- Part 1 Introduction, concepts and general requirements

- Part 2 Knowledge, skills and effectiveness requirements for ISO/IEC 19790 testers

- Part 3 Knowledge, skills and effectiveness requirements for ISO/IEC 15408 evaluators

ISO/IEC 19896 Structure

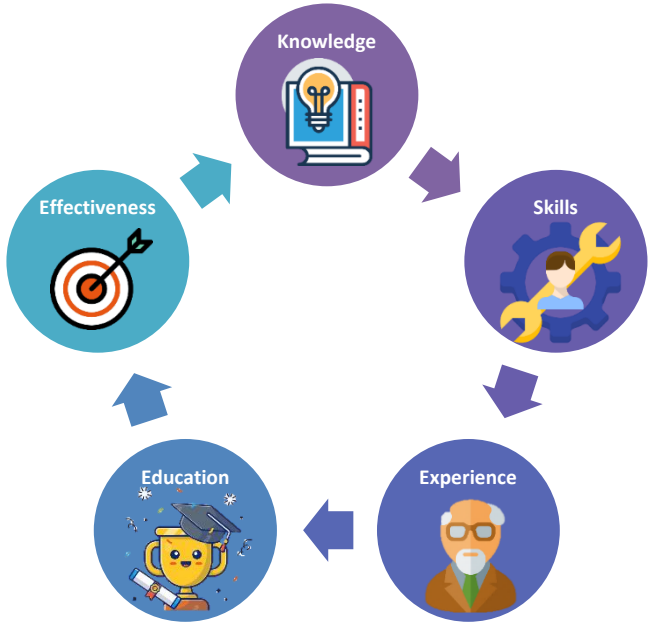
- Part 1 Introduction, concepts and general requirements
  - Elements of competence
  - Competency levels
  - Measurement of elements of competence
  - Annex A: Example structures for describing competence requirements
  - Annex B: Example records of experience and competence

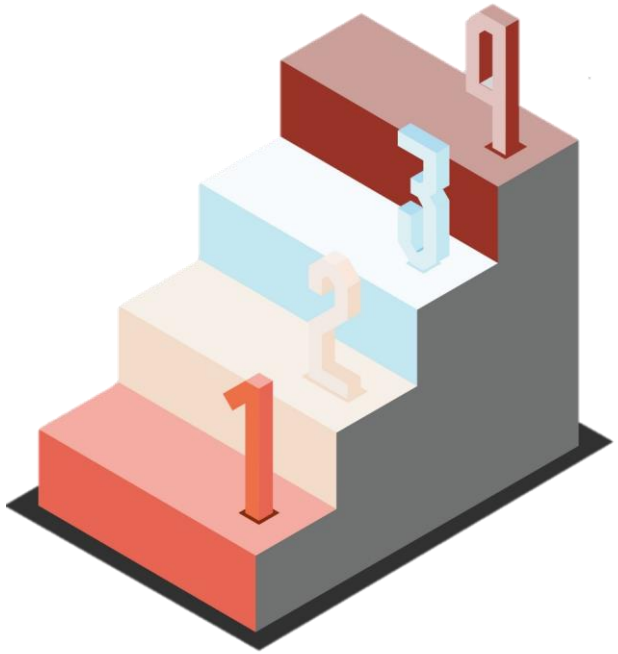
ISO/IEC 19896 Structure

- **Part 3** Knowledge, skills and effectiveness requirements for ISO/IEC 15408 evaluators
  - Baseline for the minimum competence of ISO/IEC 15408 evaluators for each element of competence (knowledge, skills, experience,…)
  - Annex A (informative) Technology types: knowledge and skills
  - Annex B (informative) Examples of knowledge required for evaluating SARs
  - Annex C (informative) Examples of knowledge required for evaluating SFRs

ISO/IEC 19896 Part 1

- The standard defines 5 elements of competence and 4 competency levels





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COMPLIANT ISO 19896 Laboratory Management System

COMPLIANT ISO 23532 Laboratory Management System

COMPLIANT ISO 17025:2017 Laboratory Management System

ISO/IEC 19896 Part 1

- **Elements of competence**
  - **Knowledge:** facts, information, truths, principles of understanding acquired through experience or education
    - Of the standard
    - Of the testing or evaluation methods
    - Policies and procedures of relevant approval authorities
    - Of IT product architecture and design in relevant technology areas

ISO/IEC 19896 Part 1

- **Elements of competence**
  - **Skills:** ability to perform a task or activity with a specific intended outcome acquired through education, training, experience or other means
    - Understanding the boundaries, documentation analysis, selection of appropriate testing methods, calibrating and using tools, build a test environment, performing testing, interpreting results, write reports, …

ISO/IEC 19896 Part 1

- **Elements of competence**

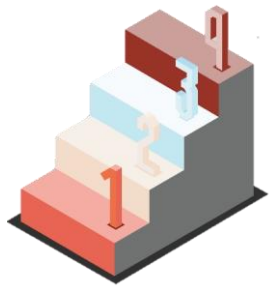
- **Experience:** involvement at a practical level with projects related to the field of competence

- **Education:** process of receiving or giving systematic instruction, especially at a school or university

- **Effectiveness:** ability to apply knowledge and skills in a productive manner
  - Accuracy of test results, ability to repeat, …

ISO/IEC 19896 Part 1

- **Competency levels**



- Assigned for each competence area of 19896-3
  - Level 1 Associate: works under supervision
  - Level 2 Professional: requires supervision in just a few areas
  - Level 3 Manager: works unsupervised in most testing or evaluation areas, supervises level 1 and 2
  - Level 4 Principal: fully competent for at least one technology area, able to communicate with stakeholders, works unsupervised in all areas, supervise other levels.
- Overall level of competency may determine designation of professional capability: Technician/Evaluator/Senior Evaluator/Lead Evaluator

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COMPLIANT ISO 19896 Laboratory Management System

COMPLIANT ISO 23532 Laboratory Management System

COMPLIANT ISO 17025:2017 Laboratory Management System

ISO/IEC 19896 Part 1

- **Measurements of elements of competence**
  - Measuring is mandatory, how to do it is not mandatory

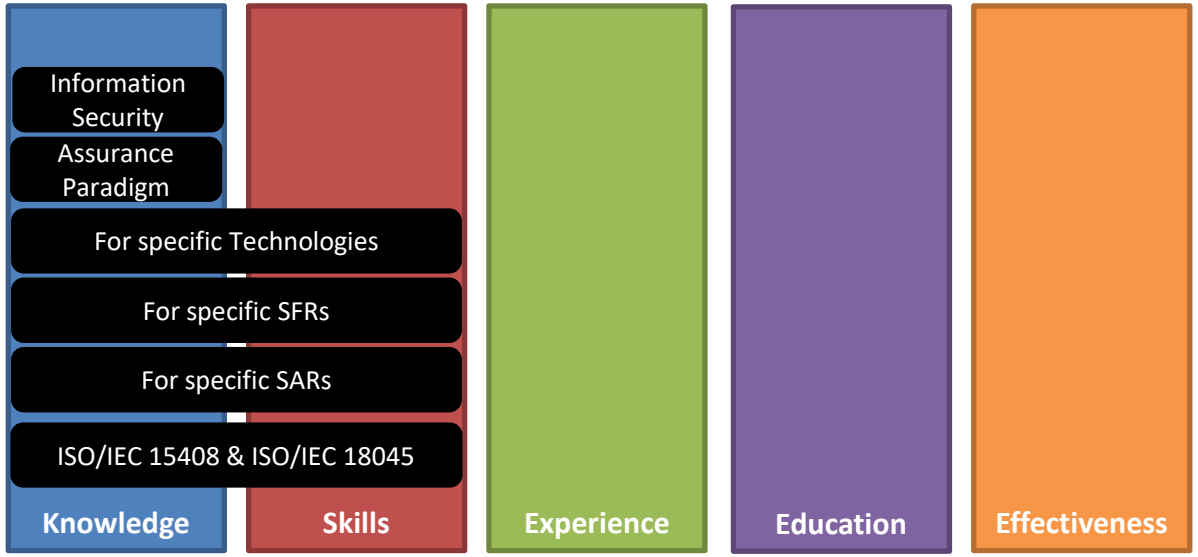
  - **Knowledge:** 19896-3 provides a measurable body of knowledge.
    - We may decide who will measure: The CAB-CB? The ITSEF? Third parties?
    - Training records and professional certifications
  - **Skills:**
    - Lab proficiency-testing programme (as required by 17025)
    - Feedback from other skilled personnel

ISO/IEC 19896 Part 1

- **Measurements of elements of competence**
  - **Experience**:
    - Records of projects completed
  - **Education**:
    - Certificates issued by organizations recognized as legitimate by the approval authority
  - **Effectiveness:**
    - Time needed, nonconformities, adaptability , accuracy, …

ISO/IEC 19896 Part 3

- Provides baseline for the minimum competence of ISO/IEC 15408 evaluators for each element of competence (knowledge, skills, experience,…)



ISO/IEC 19896 Part 3

- **Knowledge:** what an evaluator knows and can describe

- ISO/IEC 15408 and ISO/IEC 18045
  - Terms and definitions
  - Protection profiles and packages
  - SFRs and SARs
  - The evaluation process
  - Method and activities

- The assurance paradigm
  - The evaluation authority: policies, recognition agreements, supporting documents, …
  - The evaluation scheme: interpretations, guidance policies, …
  - The lab and it's management system: policies, process and procedures; methods; competence requirements.

ISO/IEC 19896 Part 3

- **Knowledge:** what an evaluator knows and can describe
- The technology being evaluated
  - Common security architectures for each technology type. (See Informative Annex A Technology types: Knowledge and skills, based on classical CC categories).
- Protection Profiles, packages and supporting documents
- Since it is continually evolving, it is not possible to identify requirements for each technology, but can be obtained through experience. Experience can be developed by:
  - Education
  - Working as a trainee
  - Working as developer
  - Performing research

ISO/IEC 19896 Part 3

- **Knowledge:** what an evaluator knows and can describe
  - Each lab may define their technology types and requirements.
  - Information Security: security principles, attacks, attack potential, SDLC, testing, vulnerabilities, …
  - Knowledge required for SARs (See Informative Annex B Examples of knowledge for SARs)
  - Knowledge required for specific SFRs (See Informative Annex C Examples of knowledge for SFRs)

ISO/IEC 19896 Part 3

- **Skills:** what an evaluator is able to do
  - Basic evaluation skills
    - Evaluation methods: sampling, analysis, recording results, …
    - Evaluation tools: report generation, specialized tools
  - Core evaluation skills given in ISO/IEC 15408-3 and ISO/IEC 18045
    - Evaluation principles: impartiality, objectivity, repeatability, reproducibility
    - Evaluation methods and activities (knowledge of the ISO 18045 verbs like check/confirm/demonstrate/….)
  - Skills required when evaluation specific SARs
    - General: ability to write ORs
    - For each assurance component specific skills are required (mandatory)
      - E.g. VAN.3 Flaw hypothesis development

ISO/IEC 19896 Part 3

- **Skills:** what an evaluator is able to do
  - Skills required when evaluation specific SFRs (mandatory)
    - General: ability to understand and test for conformance and search for vulnerabilities
    - E.g. FCS being able to determine if crypto algorithms and protocols are implemented correctly
  - Skills needed when evaluating specific technologies.
    - See Informative Annex A Technology types: Knowledge and skills, based on classical CC categories.
    - Like in Knowledge, skills can be obtained through experience.

ISO/IEC 19896 Part 3

- **Experience**

  - Experience is gained during the first and subsequent evaluations performed by an evaluator.
  - Also during consultancy or product development

- **Education**

  - At a minimum
    - Tertiary education with at least 3 years of IT studies
    - Experience which provided equivalent knowledge skills and effectiveness

ISO/IEC 19896 Part 3

- **Effectiveness**
  - Timely evaluations, e.g. time needed to develop or execute a test
  - Accurate evaluations, e.g. comments received during validation
  - Reports contain rationales and references with direct and focused language quickly understandable by the intended reader of the report.

ISO/IEC 19896 Part 3

- **Effectiveness**
  - Evaluator shall be able to apply knowledge and skills in a productive manner: aptitude, initiative, enthusiasm, willingness, …
  - Required evaluation principles: impartiality, objectivity, repeatability, reproducibility
  - Scheme guidance and procedures are followed

ISO/IEC 19896 Part 3 – Annexes

- **Annex A, technology types: knowledge and skills**
- **Knowledge**

- Knowledge required by evaluators working with specific technologies. List concepts that shall be known by evaluators for each classic CC technology category.
  - PPs related to technology type
  - Evaluation methods and activities related to the technology type
  - Technological standards related to the technology type
- The depth of knowledge depends on the assurance classes (e.g. Evaluators doing ALC may require less knowledge)

ISO/IEC 19896 Part 3 – Annexes

- **Annex A, technology types: knowledge and skills**
- **Knowledge**

- E.g. Databases
  - Concepts of data base management systems architecture
  - Access control methods

ISO/IEC 19896 Part 3 – Annexes

- **Annex A, technology types: knowledge and skills**
- **Skills**

- Mostly related to ATE
- Skills required by evaluators working with specific technologies
  - Performance of evaluation methods and activities associated with the technology type
  - Being able to understand related technological standards
- Lists the skills that shall be build upon evaluators for each classic CC technology category

ISO/IEC 19896 Part 3 – Annexes

- **Annex A, technology types: knowledge and skills**
- **Skills**

- E.g. Databases
  - Being able to correctly configure the database management system (DBMS) platforms
  - Being able to use structure query language (SQL) or other database query languages.

ISO/IEC 19896 Part 3 – Annexes

- **Annex B, examples of knowledge for SARs**
  - Minimum knowledge required for each SAR class. E.g.
    - ADV_ARC.1:
      - Self-protection property
      - Domain separation property
      - Non-bypassability property
      - Secure architecture and design concepts

B

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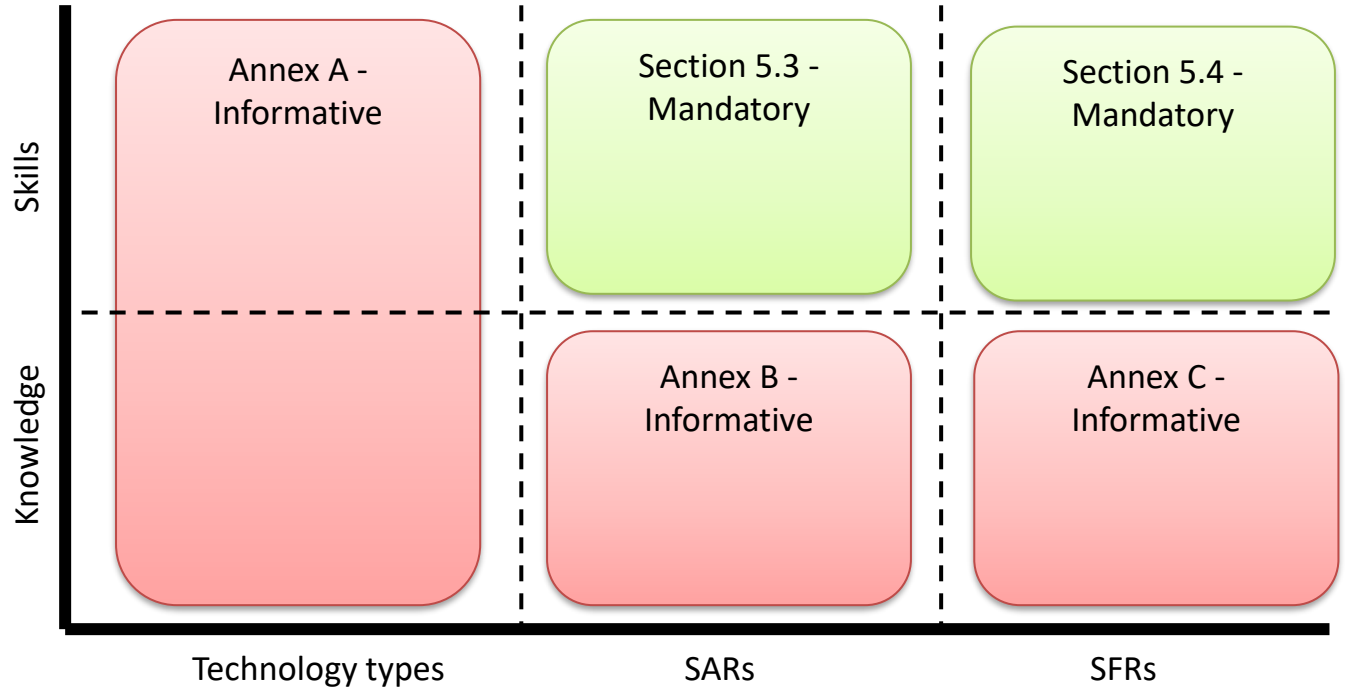
ISO/IEC 19896 Part 3 – Annexes

- **Annex C, examples of knowledge for SFRs**
  - Minimum knowledge required for each SFR class. E.g.
    - FCO (Communication) Class
      - Proof origin
      - Non-repudiation of origin
      - Non-repudiation of receipt

ISO/IEC 19896 Part 3 – Annexes



How to implement in 6 easy steps?

- 1.- Define each job position for each evaluator level including the requirements in terms of competence
- 2.- Record the education and experience of each evaluator
  - Validate years of education or experience based on well-known person certifications?
- 3.- Track the knowledge you transmit to your team
- 4.- Assess the skills through questionnaires
- 5.- Evaluate the effectiveness through internal reviews and intercomparisons
- 6.- Put it all together!

Conclusions

- The ISO 19896 framework for competency is a good framework but every lab shall define their technology types and knowledge (/skills) requirements because some are kind of ‘artificial’, specially Annex A.
- A competence management system can be used just to pass audits, not being really useful. Lab managers already know their evaluators, but this may not scale. Garbage in – Garbage out.
- It is difficult to reflect some intangible skills like the “killer instinct” or the skill to report. There is always some subjectivity.

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“Any fool can make something complicated. It takes a genius to make it simple.”
Woody Guthrie