Culture of Biosafety and Biosecurity: What Gets Measured Gets Done

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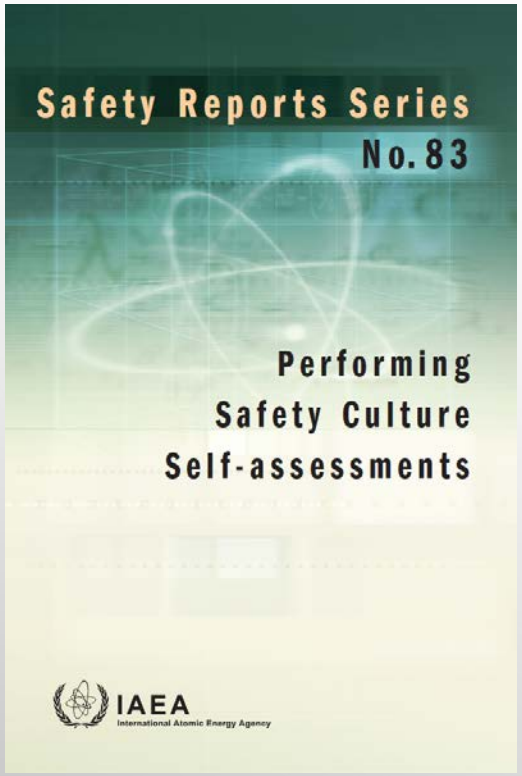
Lessons and observations from the evolution of the nuclear safety and security culture

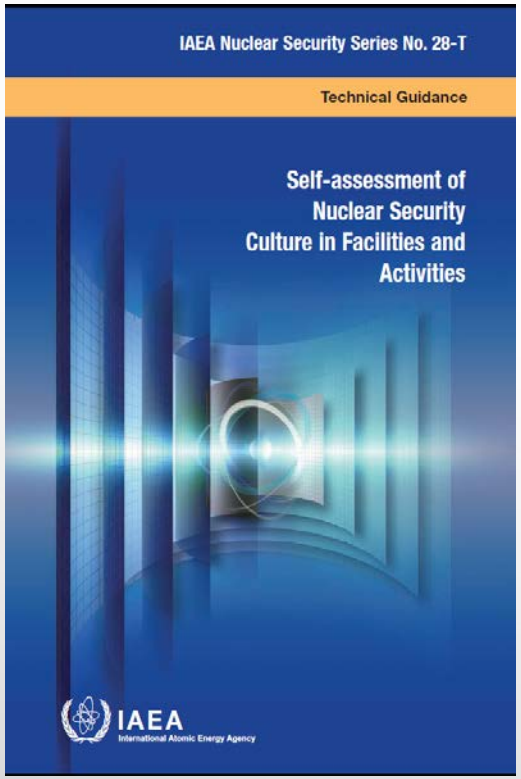
The IAEA began to recognize the importance of human and organizational factors in nuclear safety and security following the Chernobyl accident.

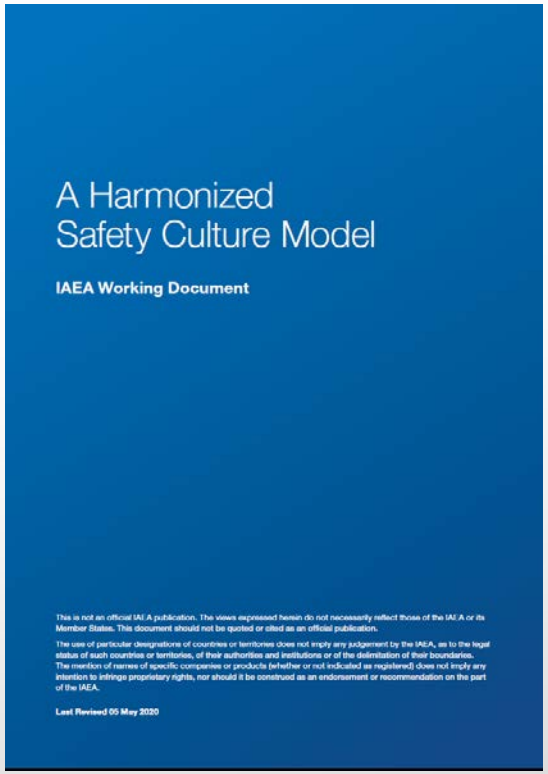
In-depth analyses of a number of radiation and nuclear accidents have shown that weaknesses in either (or both) safety and security culture were one of the foremost root causes of the accidents.

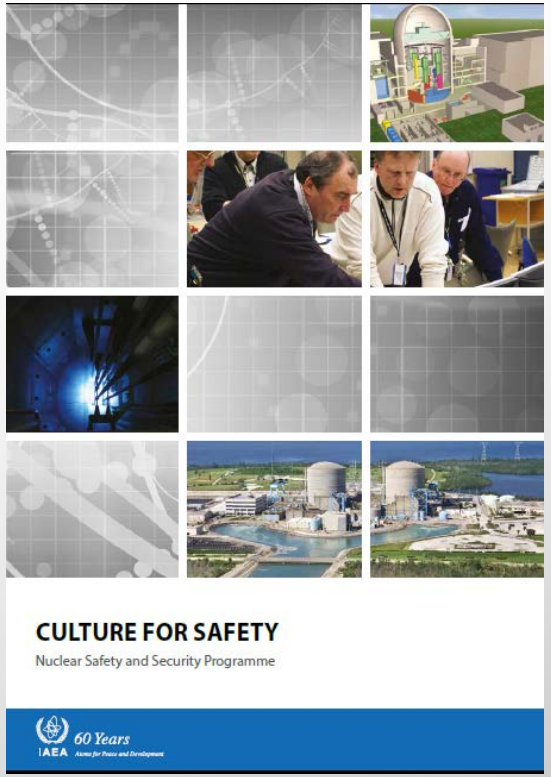
"Culture for safety and security" evolved from a theoretical approach to a more practical, holistic one. Initially defined as an assembly of characteristics and attitudes, it now emphasizes creating an organizational culture that prioritizes safety and security in all aspects of operation, from nuclear facilities to all activities involving radioactive materials and radiation.

Self-assessment tools









- **Surveys: Provide a general "snapshot" of employee's perceptions of the current state of safety and security**
- **Interviews/Focus Groups: Engage with a group or class of employees to gain perceptions on a specific topic to obtain in-depth knowledge**
- **Observations: Passively obtain knowledge of practices and procedures in real-time and in a casual setting**
- **Document Reviews: Understand standard procedures and protocols and compare with actual implementation**

Main actors

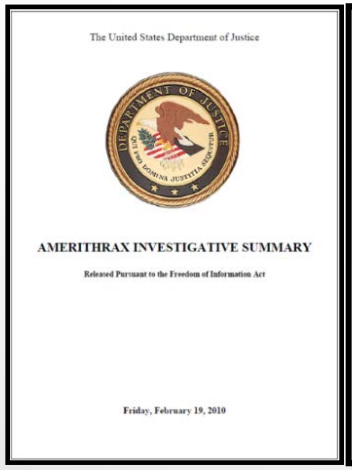
"The IAEA provides tools and training to Member States to assess, improve and strengthen the safety and security culture throughout the lifetime of their facilities and activities. This includes specific support services such as Independent Safety Culture Assessments (ISCA) and the Safety Culture Continuous Improvement Process (SCCIP), which includes training support on conducting safety culture self-assessments as well as support to implement the IAEA Safety Culture Self-Assessment methodology.

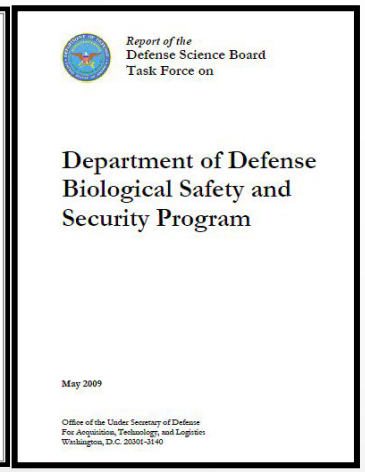
Finally, the IAEA offers a range of tailored support missions based on Member States' needs."

"INSAG will provide recommendations and opinions on current and emerging nuclear safety issues to the IAEA, the nuclear community and the public."

INSEN is a collaboration among universities, research institutes, and other stakeholders under the auspices of the IAEA, with the aim to support, sustain and promote nuclear security education. INSEN's three working groups focus on: 1) Development and maintenance of educational materials, tools, and methodologies; 2) Program, curriculum, and faculty development; 3) Knowledge management and promotion of nuclear security education and INSEN.

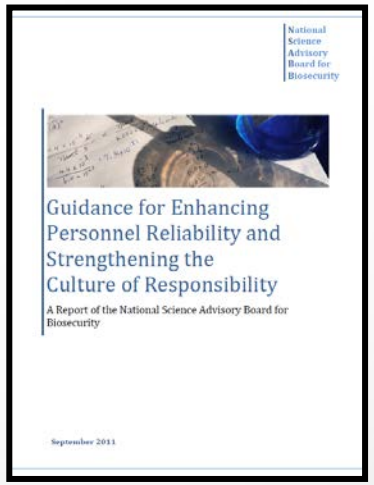
Culture matters





"The single overarching finding of this [Amerithrax] investigation is that ***a determined adversary cannot be prevented from obtaining very dangerous biological materials intended for nefarious purposes…"***

Recommendations include making *"changes to monitoring activities to improve effectiveness without introducing overly intrusive measures. Hold periodic meetings with laboratory personnel to reinforce values, moral obligations, and observations that should be reported".*

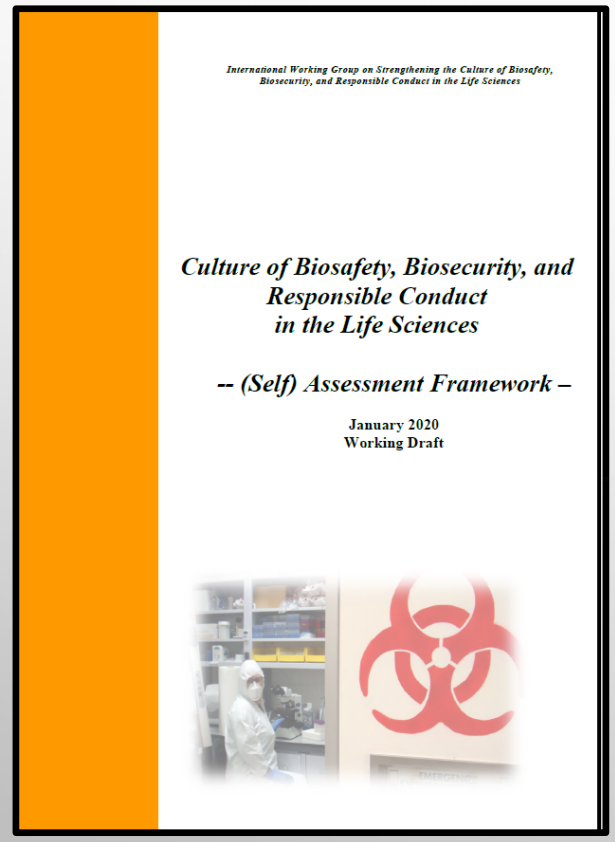


"Above all, good management practices are the foundation that underpins the development of a culture of responsibility, integrity, trust, and effective biosecurity. In addition, strong institutional and laboratory leadership, clear articulation of priorities and expectations, and an institutional framework that provides relevant education, training, performance review, and employee support will facilitate responsible practices, personnel reliability, safety, and security…"

"… in cultivating and sustaining a ***culture of responsibility,*** *scientists who conduct research must recognize that they engage in a continuous, reciprocal process of promoting and bearing mutual responsibility for their work.* ***They must hold themselves and their peers accountable—collegially and with a shared commitment to advancing science and maintaining public trust."***

"…much more can – and must – be done to move away from traditional thinking around one-size-fits-all global biosafety and biosecurity standards, and to build the risk-based approach into laboratory culture around the world."

International working group on strengthening the culture of biosafety, biosecurity, and responsible conduct in the life sciences



Management Systems

Behavior of Leadership and Personnel

Principles for Guiding Decisions and Behaviors

Beliefs and Attitudes

Framework available for download at:

https://absa.org/wp-content/uploads/2020/02/culture_of_biosafety-biosecurity_self-assessment_framework.pdf

Accompanied by a data collection tool at:

https://absa.org/wp-content/uploads/2020/02/culture_of_biosafety-biosecurity_self-assessment_framework-template.xlsx

Culture of responsibility in international context

Biological Weapons Convention

The 7th and 8th Review Conferences of the BWC noted "*the value of national implementation measures…to … encourage the promotion of a culture of responsibility amongst relevant national professionals and the voluntary development, adoption and promulgation of codes of conduct.*"

Global Partnership Against the Spread of Weapons and Materials of Mass destruction

The 5th Biological Security Deliverable of the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction aims to "*reduce biological proliferation risks through the advancement and promotion of safe and responsible conduct*".

Global Health Security Agenda (2019-2024)

GHSA 5-year target toward promoting national biosafety and biosecurity systems: … "*biological risk management training and educational outreach are conducted to promote a shared culture of responsibility*…"

International standards


INTERNATIONAL STANDARD

ISO 35001

First edition
2019-11

Biorisk management for laboratories and other related organisations

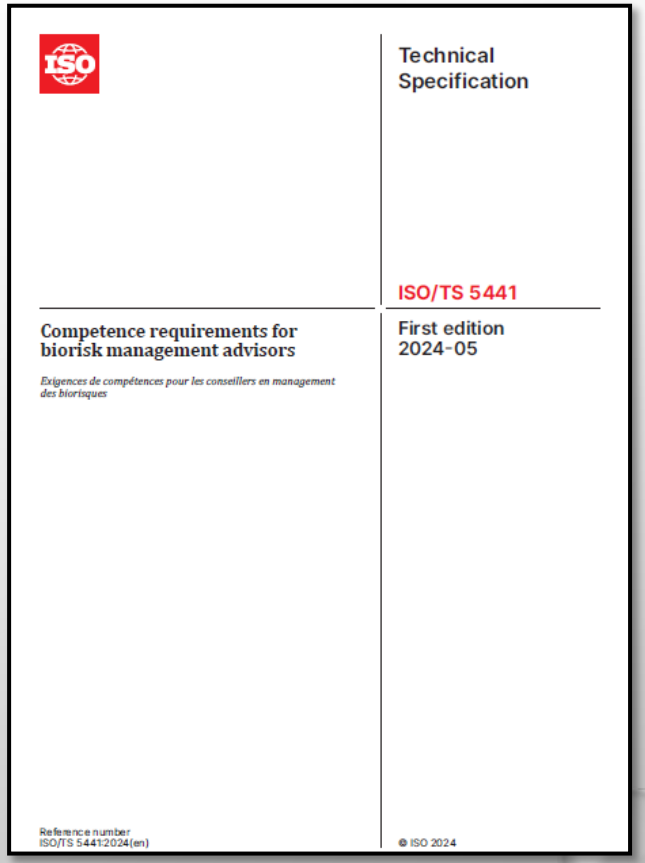
Système de management des biorisques en laboratoires et autres organismes associés

ISO

Reference number
ISO 35001:2019(E)

© ISO 2019

*"**biorisk culture**: this culture is crucial for the success of biorisk management and is built from mutual trust and the active engagement of all personnel across the organization, with a clear commitment from the organization's management".*


ISO

Technical Specification

ISO/TS 5441

Competence requirements for biorisk management advisors

Exigences de compétences pour les conseillers en management des biorisques

First edition
2024-05

Reference number
ISO/TS 5441:2024(en)

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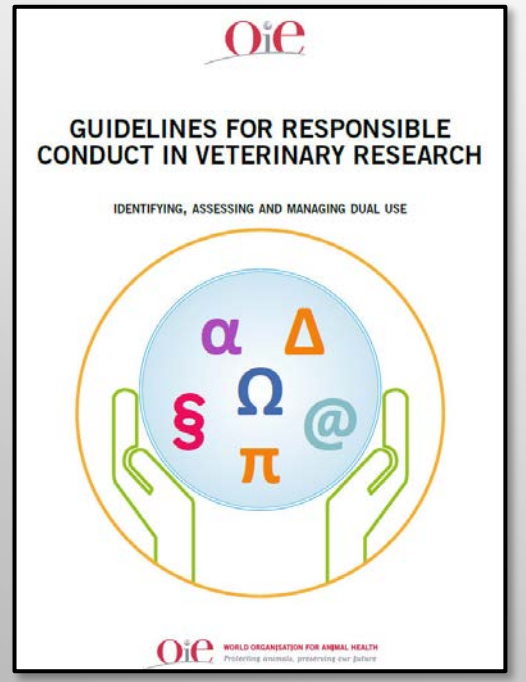
International guidelines

***Guidelines for Responsible Conduct in the Veterinary Research* (WOAH, 2019)**



***Tianjin Biosecurity Guidelines for Codes of Conduct for Scientists* (IAP, 2021)**


The Tianjin Biosecurity Guidelines for Codes of Conduct for Scientists

Advances in the biological sciences bring about wellbeing for humanity, but the same advances could be misused, particularly for the development and proliferation of biological weapons. To promote a culture of responsibility and guard against such misuse, all scientists, research institutions, and governments are encouraged to incorporate elements from the **Tianjin Biosecurity Guidelines for Codes of Conduct for Scientists** in their national and institutional practices, protocols, and regulations. The ultimate aim is to prevent misuse of bioscience research without hindering beneficial outcomes, in accordance with the articles and norms of the Biological and Toxin Weapons Convention (BWC), and in advancement of progress towards achieving the UN Sustainable Development Goals.

1. Ethical Standards

Scientists* should respect human life and relevant social ethics. They have a special responsibility to use biosciences for peaceful purposes that benefit humankind, to promote a culture of responsible conduct in biosciences and to guard against the misuse of science for malicious purposes, including harm to the environment.

2. Laws and Norms

Scientists should be aware of and observe applicable domestic laws and regulations, international legal instruments, and norms relating to biological research, including those on the prohibition of biological weapons. Scientists and their professional bodies are encouraged to contribute to the establishment and further development and strengthening of relevant legislation.

3. Responsible Conduct of Research

Scientists should promote scientific integrity and strive to prevent misconduct in research. They should be aware of the multiple applications of biological sciences, including their potential use for developing biological weapons. Measures should be taken to prevent the misuse and negative impacts of biological products, data, expertise, or equipment.

* For purposes of this document, "scientists" are practitioners engaged in work that includes biological science, including those involved in funding, education, and training; research and development (in the public and private sectors); project planning, management, dissemination, and oversight.

The Tianjin Biosecurity Guidelines for Codes of Conduct for Scientists | 1

***Global Guidance Framework for the Responsible Use of the Life Sciences* (WHO, 2022)**

WHO Technical Advisory Group on the Responsible Use Of the Life Sciences and Dual-use Research (TAG- RULS DUR)

World Health Organization

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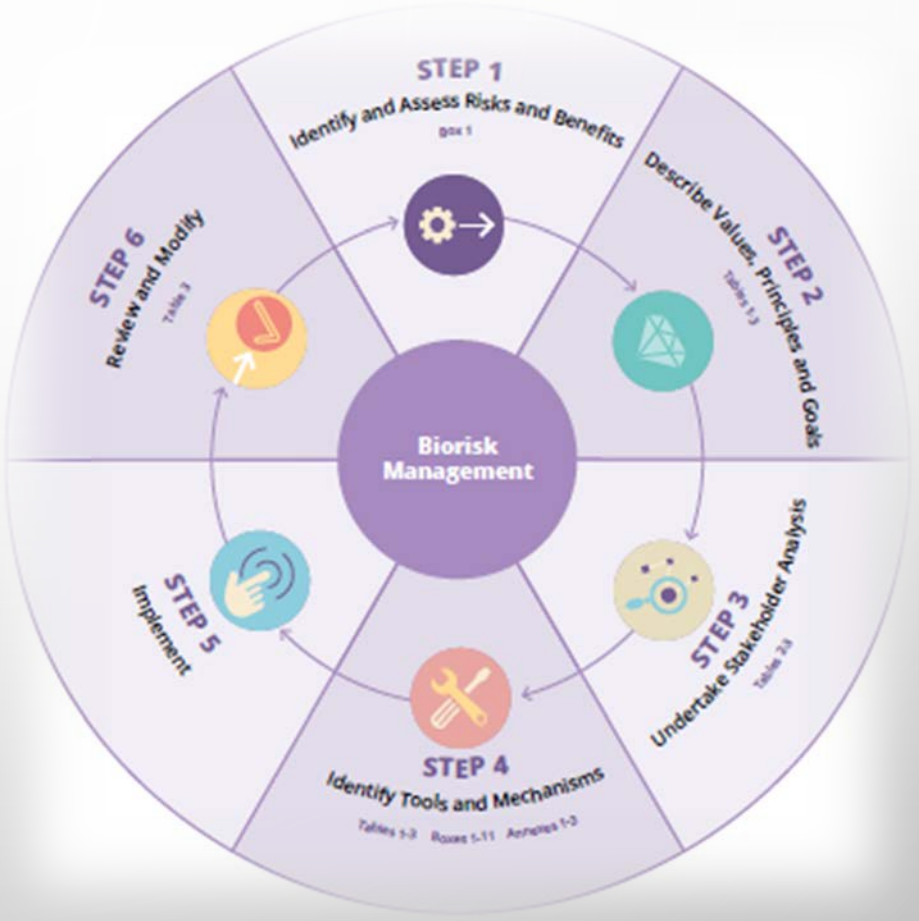
Implementing the *Global Guidance Framework for the Responsible Use of the Life Sciences* (WHO, 2022)

A six-step approach



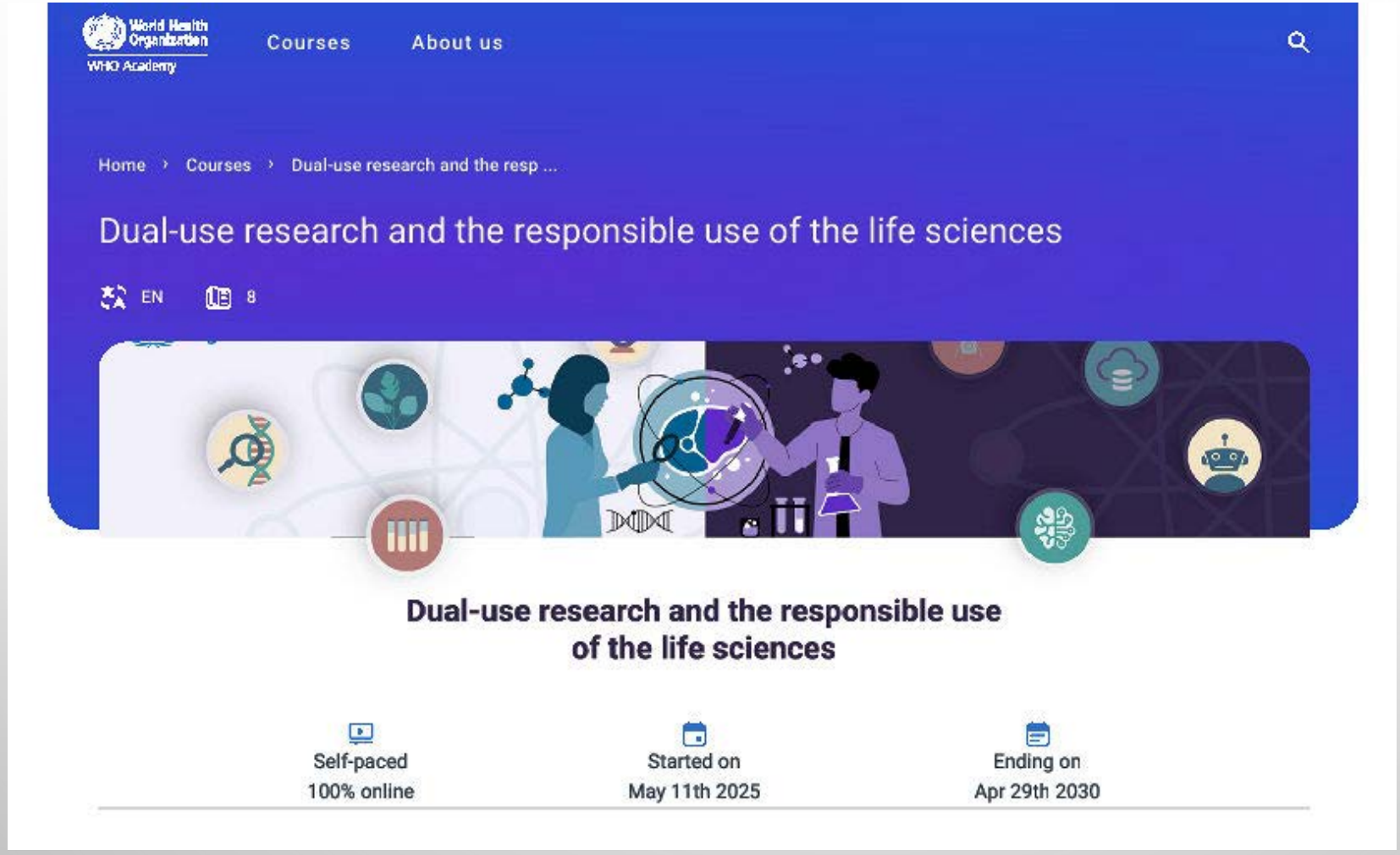
Checklists for various stakeholders

- National governments
- Scientists
- Research institutions
- Funding bodies
- Publishers and editors
- Civil society networks and publics
- The private sector

Conclusion

- ***The global guidance framework for the responsible use of the life sciences*** **(WHO, 2022) is the most significant milestone up to date in operationalizing the concept of a culture of biosafety, biosecurity, and responsible conduct in the life sciences, and implementing the WHA *77.7* resolution calling on member states, inter alia, to "*promote … a sound culture of biosafety and biosecurity at all institutional levels*…"**

- **The WHO courses (DUR RULS – just published and the upcoming Biorisk Implementation and Monitoring Tool, respectively) are expected to fill a significant gap in creating an institutional culture of responsibility for biosafety and biosecurity, where biosafety and biosecurity are outcomes of an organization's values, beliefs, and behaviors.**



https://whoacademy.org/coursewares/course-v1:whoacademy-hosted+h0126en+2025_q2

TAG-RULS DUR webpage

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Technical Advisory Group on the Responsible Use of the Life Sciences and Dual-Use Research (TAG-RULS DUR)

The Technical Advisory Group on the Responsible Use of the Life Sciences and Dual-Use Research (TAG- RULS DUR) provides independent and strategic advice to WHO around technical areas relevant to the monitoring and mitigation of biorisks, advances in the life sciences and related technologies, the governance of dual-use research and the responsible use of the life sciences.

Subscribe to the WHO newsletter on Responsible Sciences and Emerging Technologies