which enacted this chapter and enacted, amended, and repealed numerous other sections and notes in the Code. For complete classification of div. B to the Code, see Short Title note set out under section 18901 of this title and Tables.

Division A, referred to in subsec. (a)(1)(A), (2), is div. A of Pub. L. 117–167, Aug. 9, 2022, 136 Stat. 1372, known as the CHIPS Act of 2022. For complete classification of div. A to the Code, see Short Title of 2022 Amendment note set out under section 4651 of Title 15, Commerce and Trade, and Tables.

Section 9(b)(3) of the Uyghur Human Rights Policy Act of 2020, referred to in subsec. (a)(3)(D), is section 9(b)(3) of Pub. L. 116–145, June 17, 2020, 134 Stat. 656, which is not classified to the Code.

SUBCHAPTER II—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY FOR THE FUTURE

§ 18921. Definitions

In this subchapter:

(1) Director

The term ''Director'' means the Director of the National Institute of Standards and Technology.

(2) Enrollment of needy students

The term ''enrollment of needy students'' has the meaning given the term in section 1058(d) of title 20.

(3) Framework

The term ''Framework'' means the Framework for Improving Critical Infrastructure Cybersecurity developed by the National Institute of Standards and Technology and referred to in Executive Order No. 13800 issued on May 11, 2017 (82 Fed. Reg. 22391 et seq.).

(4) Institute

The term ''Institute'' means the National Institute of Standards and Technology.

(5) International standards organization

The term ''international standards organization'' has the meaning given such term in section 2571 of title 19.

(6) Secretary

The term ''Secretary'' means the Secretary of Commerce.

(Pub. L. 117–167, div. B, title II, § 10201, Aug. 9, 2022, 136 Stat. 1471.)

Editorial Notes

REFERENCES IN TEXT

Executive Order No. 13800, referred to in par. (3), is set out as a note preceding section 1500 of Title 6, Domestic Security.

PART A—MEASUREMENT RESEARCH

§ 18931. Engineering biology and biometrology

(a) In general

The Director, in coordination with the National Engineering Biology Research and Development Initiative established pursuant to subchapter IV, shall—

(1) support basic measurement science and technology research for engineering biology, biomanufacturing, and biometrology to advance—

(A) measurement technologies to support foundational understanding of the mechanisms of conversion of DNA information into cellular function;

(B) technologies for measurement of such biomolecular components and related systems;

(C) new data tools, techniques, and processes to improve engineering biology, biomanufacturing, and biometrology research; and

(D) other areas of measurement science and technology research determined by the Director to be critical to the development and deployment of engineering biology, biomanufacturing and biometrology;

(2) support activities to inform and expand the development of measurements infrastructure needed to develop technical standards to establish interoperability and facilitate commercial development of biomolecular measurement technology and engineering biology applications;

(3) convene industry, institutions of higher education, nonprofit organizations, Federal laboratories, and other Federal agencies engaged in engineering biology research and development to develop coordinated technical roadmaps for authoritative measurement of the molecular components of the cell;

(4) provide access to user facilities with advanced or unique equipment, services, materials, and other resources to industry, institutions of higher education, nonprofit organizations, and government agencies to perform research and testing;

(5) establish or expand collaborative partnerships or consortia with other Federal agencies engaged in engineering biology research and development, institutions of higher education, Federal laboratories, and industry to advance engineering biology applications; and

(6) support graduate and postgraduate research and training in biometrology, biomanufacturing, and engineering biology.

(b) Rule of construction

Nothing in this section may be construed to alter the policies, processes, or practices of individual Federal agencies in effect on the day before August 9, 2022, relating to the conduct or support of biomedical research and advanced development, including the solicitation and review of extramural research proposals.

(c) Controls

In carrying out activities authorized by this section, the Secretary shall ensure proper security controls are in place to protect sensitive information, as appropriate.

(Pub. L. 117–167, div. B, title II, § 10221, Aug. 9, 2022, 136 Stat. 1474.)

§ 18932. Greenhouse gas measurement research

(a) In general

The Director, in consultation with the Administrator of the National Oceanic and Atmospheric Administration, the Administrator of the Environmental Protection Agency, the National Aeronautics and Space Administration, the Di-

rector of the National Science Foundation, the Secretary of Energy, and the heads of other Federal agencies, as appropriate, shall carry out a measurement research program to inform the development or improvement of best practices, benchmarks, methodologies, procedures, and technical standards for the measurement of greenhouse gas emissions and to assess and improve the performance of greenhouse gas emissions measurement systems placed in situ and on space-based platforms.

(b) Activities

In carrying out such a program, the Director may—

(1) conduct research and testing to improve the accuracy, efficacy, and reliability of the measurement of greenhouse gas emissions at a range of scales that covers direct measurement at the component or process level through atmospheric observations;

(2) conduct research to create novel measurement technologies and techniques for the measurement of greenhouse gas emissions;

(3) convene and engage with relevant Federal agencies and stakeholders to establish common definitions and characterizations for the measurement of greenhouse gas emissions, taking into account any existing United States and international technical standards and guidance;

(4) conduct outreach and coordination to share technical expertise with relevant industry and nonindustry stakeholders and standards development organizations to—

(A) assist such entities in the development and adoption of best practices and technical standards for greenhouse gas emissions measurements; and

(B) promote consistency and traceability in international reference standards and central calibration laboratories;

(5) in coordination with the Administrator of the National Oceanic and Atmospheric Administration, the Administrator of the Environmental Protection Agency, and the Secretary of Energy, develop such standard reference materials as the Director determines is necessary to further the development of such technical standards, taking into account any existing United States or international standards;

(6) coordinate with the National Oceanic and Atmospheric Administration to ensure data are managed, stewarded, and archived at all levels and promote full and open exchange at Federal and State levels, and with academia, industry, and other users; and

(7) coordinate with international partners, including international standards organizations, to maintain global greenhouse gas measurement technical standards.

(c) Testbeds

In coordination with the private sector, institutions of higher education, State and local governments, the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, the Department of Energy, and other Federal agencies, as appropriate, the Director may continue to develop and manage testbeds to advance research and standards development for greenhouse gas emissions measurements from in situ and space-based platforms.

(d) Center for Greenhouse Gas Measurements, Standards, and Information

(1) In general

The Director, in collaboration with the Administrator of the National Oceanic and Atmospheric Administration, the Administrator of the Environmental Protection Agency, and the heads of other Federal agencies, as appropriate, shall establish a Center for Greenhouse Gas Measurements, Standards, and Information (in this subsection referred to as the ''Center'').

(2) Collaborations

The Director shall require that the activities of the Center include collaboration among public and private organizations, including institutions of higher education, nonprofit organizations, private sector entities, and State, Tribal, territorial, and local officials.

(3) Purpose

The purpose of the Center shall be to—

(A) advance measurement science, data analytics, and modeling at a range of scales that covers direct measurement and estimation at the component or process level through atmospheric observations and at the analysis level to improve the accuracy of spatially and temporally resolved greenhouse gas emissions measurement, validation, and attribution to specific underlying activities and processes;

(B) test and evaluate the performance of existing capabilities, and inform and improve best practices, benchmarks, methodologies, procedures, and technical standards, for the measurement and validation of greenhouse gas emissions at scales noted in subparagraph (A);

(C) educate and train students in measurement science, computational science, and systems engineering research relevant to greenhouse gas emissions measurements;

(D) foster collaboration among academic researchers, private sector stakeholders, and State, Tribal, territorial, and local officials in the use of Institute testbeds as described in subsection (c);

(E) conduct activities with research institutions, industry partners, and State and local officials to identify research, testing, and technical standards needs relevant to greenhouse gas emissions; and

(F) collaborate with other Federal agencies to conduct outreach and coordination to share and promote technical data, tools, and expertise with relevant public and private sector stakeholders, including State, Tribal, territorial, and local officials, to assist such in the accurate measurement of greenhouse gas emissions.

(Pub. L. 117–167, div. B, title II, § 10222, Aug. 9, 2022, 136 Stat. 1475.)

§ 18933. Software security and authentication

(a) Vulnerabilities in open source software

The Director shall assign severity metrics to identified vulnerabilities with open source software and produce voluntary guidance to assist the entities that maintain open source software repositories to discover and mitigate vulnerabilities.

(b) Artificial intelligence-enabled defenses

The Director shall carry out research and testing to improve the effectiveness of artificial intelligence-enabled cybersecurity, including by generating optimized data sets to train artificial intelligence defense systems and evaluating the performance of varying network architectures at strengthening network security.

(c) Authentication of Institute software

The Director shall ensure all software released by the Institute is digitally signed and maintained to enable stakeholders to verify its authenticity and integrity upon installation and execution.

(d) Assistance to Inspectors General

Subject to available funding, the Director shall provide technical assistance to improve the education and training of individual Federal agency Inspectors General and staff who are responsible for the annual independent evaluation they are required to perform of the information security program and practices of Federal agencies under section 3555 of title 44.

(e) Software supply chain security practices

(1) In general

The Director shall, in coordination with industry, academia, and other Federal agencies, as appropriate, develop a set of security outcomes and practices, including security controls, control enhancements, supplemental guidance, or other supporting information to enable software developers and operators to identify, assess, and manage cybersecurity risks over the full lifecycle of software products.

(2) Outreach

The Director shall conduct outreach and coordination activities to share technical expertise with Federal agencies, relevant industry stakeholders, and standards development organizations, as appropriate, to encourage the voluntary adoption of the software lifecycle security practices by Federal agencies and industry stakeholders.

(Pub. L. 117–167, div. B, title II, § 10224, Aug. 9, 2022, 136 Stat. 1478.)

§ 18934. Biometrics research and testing

(a) In general

The Secretary, acting through the Director, shall establish a program to support measurement research to inform the development of best practices, benchmarks, methodologies, procedures, and voluntary, consensus-based technical standards for biometric identification systems, including facial recognition systems, to assess and improve the performance of such systems. In carrying out such program, the Director may—

(1) conduct measurement research to support efforts to improve the performance of biometric identification systems, including in areas related to conformity assessment, image quality and interoperability, contactless biometric capture technologies, and human-in-the-loop biometric identification systems and processes;

(2) convene and engage with relevant stakeholders to establish common definitions and characterizations for biometric identification systems, which may include accuracy, fairness, bias, privacy, consent, and other properties, taking into account definitions in relevant international technical standards and other publications;

(3) carry out measurement research and testing on a range of biometric modalities, such as fingerprints, voice, iris, face, vein, behavioral biometrics, genetics, multimodal biometrics, and emerging applications of biometric identification technology;

(4) study the use of privacy-enhancing technologies and other technical protective controls to facilitate access, as appropriate, to public data sets for biometric research;

(5) conduct outreach and coordination to share technical expertise with relevant industry and nonindustry stakeholders and standards development organizations to assist such entities in the development of best practices and voluntary technical standards; and

(6) develop such standard reference artifacts as the Director determines is necessary to further the development of such voluntary technical standards.

(b) Biometrics test program

(1) In general

The Secretary, acting through the Director, shall carry out a test program to provide biometrics vendors the opportunity to test biometric identification technologies across a range of modalities.

(2) Activities

In carrying out the program under this subsection, the Director shall—

(A) conduct research and regular testing to improve and benchmark the accuracy, efficacy, and bias of biometric identification technologies, which may include research and testing on demographic variations, capture devices, presentation attack detection, partially occluded or computer generated images, privacy and security designs and controls, template protection, de-identification, and comparison of algorithm, human, and combined algorithm-human recognition capability;

(B) develop an approach for testing software and cloud-based biometrics applications, including remote systems, in Institute test facilities;

(C) establish reference use cases for biometric identification technologies and performance criteria for assessing each use case, including accuracy, efficacy, and bias metrics;