



Technical Meeting on Experience in Codes and Standards for Fusion Technology

IAEA Headquarters, Vienna, Austria

18-21 November 2025

Ref: EVT2404255

Room: M5 (Hybrid)

Information Sheet

Introduction

This meeting aims to support and strengthen international cooperation on fusion research and development with the goal of building scientific and technical knowledge in this field for the construction of fusion power plants. Many fusion companies have started, or plan to start fusion prototype operations within the next decade, if these prototype designs are to reach commercialisation, then codes and standards (C&S) should be developed in parallel with the fusion industry. Building on a series of consultancy meetings held by the IAEA in 2023 and 2024, and by the United Kingdom Atomic Energy Authority in February 2025, this meeting focuses on the development and identification of C&S for fusion. Inputs from this meeting will contribute to an IAEA database on C&S which is being developed for the IAEA Fusion CONNECT (FUSE) platform. The C&S database will be continually updated by fusion organisations/companies to identify common C&S, (which can be adapted from other sectors) which apply across fusion technologies. Areas where there are significant gaps (ex. tritium breeding) or areas where revisions are required (ex. ASME Boiler and Pressure Vessel Code) can then be identified in the database and handed to codes and standards organisations so that C&S can be developed to support the growth of the fusion sector.

There are key factors to consider when addressing C&S for fusion, these include:

- Risks associated with not developing C&S, these include custom engineering from scratch for each design, a risk of overdesign, licensing delays, a higher overall project cost and delays to timelines. In the long-term, if all technological challenges have been solved but fusion plants are economically inviable then fusion will not be commercially deployed.
- Identification of safety critical components is important, with considered thought to the C&S which should be applied to these components. However, many of the components in a fusion plant are non-safety critical and therefore their failure only concerns investment protection. Companies and organisations will want to prove the success of their novel non-safety critical components, for example by in-situ monitoring of novel non-safety critical components.
- C&S should be developed alongside the fusion industry, aligning with its growth and maturity. Not all data on fusion plants will necessarily be available prior to the commissioning of a plant, therefore C&S on non-safety critical components should be guiding. If C&S are too prescriptive then this could stifle innovation and lead to increased timelines and higher costs.
- Timely development of C&S. It is important for C&S to be developed as the fusion industry is maturing as C&S take several years to develop and C&S should be in place when commercial deployment is reached.

Purpose

The purpose of the event is to present, review and discuss experiences of the application of codes and standards in the deployment of fusion facilities.

Objectives

The objectives of the meeting is to discuss Applicable Codes and Standards for fusion machines, share best practices, and identify key research and development gaps to prioritise future efforts and foster collaboration across stakeholders. This effort is part of the development of a Fusion CONNECT platform, hosted by the IAEA, supporting fusion power plant development and deployment through the production of several IAEA databases. These databases will address the codes and standards with different technologies, fuel cycles, and systems. This meeting is to prepare objectives and assign activities for which can contribute towards the Applicable Codes and Standards for fusion power plants database.

Specific objectives of the event are to have experts in design, construction, and testing of materials, structures, systems, and components for fusion machines:

- Discuss the status of fusion demonstration/pilot plants in progress, with particular focus on the methodology for identifying Applicable Codes and Standards:
 - Identify relevant industry Codes and Standards applicable to fusion energy systems.

- Identify areas where codes and standards do not exist, or need to be developed or revised for fusion energy systems. Some examples are listed below.
 - Materials data: operation of validated materials under different temperatures e.g. 20 K, radiation induced deformation mechanisms under 14 MeV neutrons, joints between materials, tritium permeation and Electromagnetic loads on materials. In addition, new materials are still in development and are not included in existing C&S.
 - Structural materials: application of ASME BPVC, materials qualification of radiation resistant structural materials. Other considerations such as corrosion of thermal pipes, manufacturing defects etc. Ex. material for a radiation resistant steel used for the vacuum vessel – structural materials.
 - Tritium breeder blankets (ex. molten salts, liquid metals)
 - Heat transfer systems (how to extract the heat)
 - Remote handling
 - Cybersecurity (although this is likely to be IP)
- Present and discuss attendees' proposals and current experiences in adopting applicable codes and standards for fusion power plants.
- Discuss alternative fusion technologies and fuel cycles to ensure that codes and standards are technologically neutral.
- Discuss contributions needed and identify potential contributors for:
 - Database: Applicable Codes and Standards for Fusion Power Plants (name TBD)
 - Best practices: Case studies on approaches for adopting existing codes and standards in the design, construction and operation of fusion machines.
 - Codes and Standards Developers: For those that do not exist, or need revision, which organisations can we request development (ex. ISO, IEEE, ASME).
- Discuss the methodology for developing new codes and standards, or for the revision of existing codes and standards
 - Codes and Standards Developers: For those C&S that do not exist, or need revision, what is the process or methodology for standards organisations to develop or revise C&S (ex. ISO, IEEE, ASME).
 - Fusion Demonstration/Pilot Plant Developers: What has been the process or methodology for standardizing development of materials, structures, systems, or components (ex. ITER).

Target Audience

The meeting is aimed at those involved or interested in the R&D of fusion technology, including government organisations (policymakers, analysts, regulators, and R&D organisations) and industry stakeholders (vendors, engineering companies, plant operators and technology developers).

Working Language(s)

The working language of this meeting will be English with no interpretation provided. All communications and presentations must be submitted in English.

Expected Outputs

The expected outputs are:

- Continue to identify applicable codes and standards, including those which do not currently exist, or those that need revision.
- Explore the possibilities to define the fusion codes and standards readiness levels.
- Explore the possibilities for sharing the database including by example: material properties.
- Identify the grand challenges to help define the objectives of a shared Fusion platform, agree on a format and minimum data required.
- Identify gaps and set priorities for fusion codes standards.
- Integrate safety, fusion regulatory and codes and standards (perhaps so the design).

The event will be in person at the IAEA Headquarters, Vienna. Virtual participation will be possible.

Participation and Registration

All persons wishing to participate in the event must be designated by an IAEA Member State or should be a member of an organisation that has been invited to attend.

In order to be designated by an IAEA Member State or invited organisation, participants are requested to submit their application via the InTouch+ platform (<https://intouchplus.iaea.org>) to the competent national authority (Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) or organisation for onward transmission to the IAEA by **25 August 2025**, following the registration procedure in InTouch+:

1. Access the InTouch+ platform (<https://intouchplus.iaea.org>):
 - Persons with an existing NUCLEUS account can sign in to the platform with their username and password;
 - persons without an existing NUCLEUS account can register [here](#).
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2. Once signed in, prospective participants can use the InTouch+ platform to:
 - Complete or update their personal details under ‘Complete Profile’ and upload the relevant supporting documents;
 - Search for the relevant event under the ‘My Eligible Events’ tab;

- Select the Member State or invited organisation they want to represent from the drop-down menu entitled ‘Designating Authority’ (if an invited organisation is not listed, please contact InTouchPlus.Contact-Point@iaea.org);
- If applicable, indicate whether financial support is requested and complete the relevant information (this is not applicable to participants from invited organisations);
- Based on the data input, the InTouch+ platform will automatically generate the Participation Form(Form A) and/or the Grant Application Form (Form C);
- Submit their application.

Once submitted through the InTouch+ platform, the application, together with the auto-generated form(s), **will be transmitted automatically to the required authority for approval**. If approved, the application, together with the applicable form(s), **will automatically be sent to the IAEA through the online platform**.

NOTE: The application for financial support should be made, together with the submission of the application, by **25 August 2025**.

For additional information on how to apply for an event, please refer to the [InTouch+ Help](#) page. Any other issues or queries related to InTouch+ can be sent to InTouchPlus.Contact-Point@iaea.org.

Selected participants will be informed in due course on the procedures to be followed with regard to administrative and financial matters.

Participants are hereby informed that the personal data they submit will be processed in line with the [Agency’s Personal Data and Privacy Policy](#) and is collected solely for the purpose(s) of reviewing and assessing the application and to complete logistical arrangements where required. The IAEA may also use the contact details of Applicants to inform them of the IAEA’s scientific and technical publications, or the latest employment opportunities and current open vacancies at the IAEA. These secondary purposes are consistent with the IAEA’s mandate. Further information can be found in the [Data Processing Notice](#) concerning IAEA InTouch+ platform.

Contributions and Presentations

To attend the technical meeting participants are required to submit:

- Title of your presentation (presentations will be limited to 30 minutes including Q&A). Presentations can be given on codes and standards activities.
 - What is your organisation doing to address C&S?
 - What is your methodology for identifying relevant C&S?
 - If you are a standards organisation, what is your methodology for developing new C&S, or developing/revising existing C&S?
- *Please feel free to provide a brief overview of your organisation’s fusion activities.
- Examples of identified fusion codes and standards that need development or where gaps are obviously present. A template for each C&S can be found on the INDICO platform (see below), if possible, reference to the specific section of the C&S should be provided. Key categories for the C&S are identified below:
 - Materials data
 - Structural materials
 - Tritium breeder blankets (ex. molten salts, liquid metals)
 - Heat transfer systems (how to extract the heat)
 - Remote handling

- Cybersecurity
- Other Systems

Contributions should be submitted by **25 August 2025**, with final presentation submitted to the IAEA by **10 October 2025**. Instructions on how to upload the contributions are available on the IAEA-INDICO website [Technical Meeting on Experience in Codes and Standards for Fusion Technology \(18-20 November 2025\): Overview · Indico for IAEA Conferences](#). If too many contributions are submitted, the organisers reserve the right to select a limited number of presentations from participants. Submissions must contain the author's name, email address, country, organisation and title of presentation, and examples of identified codes and standards. An electronic copy of the proceedings, consisting of presentation slides will be made available to all participants following the meeting.

Expenditures and Grants

No registration fee is charged to participants.

The IAEA is generally not in a position to bear the travel and other costs of participants in the event. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Upon specific request, such assistance may be offered to normally one participant per country, provided that, in the IAEA's view, the participant will make an important contribution to the event.

The application for financial support should be made, together with the submission of the application, by **25 August 2025**.

Venue

The event will be held at the Vienna International Centre (VIC), where the IAEA's Headquarters are located. Participants must make their own travel and accommodation arrangements.

General information on the VIC and other practical details, such as a list of hotels offering a reduced rate for IAEA participants, are listed on the following IAEA web page:

www.iaea.org/events.

Participants are advised to arrive at Checkpoint 1/Gate 1 of the VIC one hour before the start of the event on the first day in order to allow for timely registration. Participants will need to present an official photo identification document in order to be admitted to the VIC premises.

Visas

Participants who require a visa to enter Austria should submit the necessary application to the nearest diplomatic or consular representative of Austria at least four weeks before they travel to Austria. Since Austria is a Schengen State, persons requiring a visa will have to apply for a Schengen visa. In States where Austria has no diplomatic mission, visas can be obtained from the consular authority of a Schengen Partner State representing Austria in the country in question.

Key Deadlines and Dates

Extended to 25 August 2025	Deadline for submission of Participation Form (Form A), Form for Grant Application Form (Form C) (if applicable) through the official channels
25 August 2025	Deadline for submission of title of presentation, and examples of identified codes and standards through IAEA-INDICO for regular contributions.
10 October 2025	Deadline for submitting presentations to IAEA.
18 November 2025	Event begins
21 November 2025	Event ends

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Subsequent correspondence on scientific matters should be sent to the Scientific Secretaries and the Chair.