

ISO/IEC JTC1/SC22/WG9 N 658

Draft Minutes

Meeting #90 of ISO/IEC JTC 1/SC 22/WG 9

Monday, 9 June 2025

Meeting #90 of WG 9 was held Monday, 9 June 2025. The meeting was hybrid, in conjunction with the Ada Europe ([AEiC 2025](#)) Conference in Paris. The meeting started at 15:19 UTC (17:19 CEST) and ended at 17:00 UTC (19:00 CEST). The remote portion was via Zoom.

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Recess

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Call to Order

Appointment of Meeting Secretary

ISO Code of Conduct (CoC) review

https://standards.incits.org/apps/group_public/document.php?document_id=138721

Welcome and Administrative Arrangements

Approval of the [Agenda](#)

Approval of Meeting #89 Minutes [N655](#).

Introductions and Reports

Austria – Johann Blieberger (HoD)

Canada – Brad Moore (HoD)

Finland – Niklas Holsti (HoD)

Italy – Tullio Vardanega (HoD)

The process for having Italy nominate Tullio for the Convenor's role is underway, and Tullio is in contact with the SC 22 Committee Manager.

Portugal – Luis Miguel Pinho (HoD)

Spain – Alejandro Mosteo (HoD)

Switzerland – Nicholas Kaethner (HoD)

UK – Jeff Cousins (HoD)

USA – Tucker Taft (HoD)

Guests

Robin Leroy

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Liaison Reports and Introductions

Ada Europe – Dirk Craeynest

Ada-Europe would like to inform the WG9 convener that its liaison delegation to Meeting #90, held in hybrid mode co-located with the Ada-Europe conference in Paris, France, on Monday 9 June 2025, will consist of Dirk Craeynest. Erhard Plödereder sends his apologies.

As announced in our previous report, this week the Ada-Europe conference (AEiC 2025) [1] returns to Paris, 11 years after the previous edition was held in France (2014) [2]. It starts with 3 parallel tutorial tracks, followed by a 2-day core program with distinct types of technical presentations, and ends with 3 parallel full-day workshops.

[1] <http://www.ada-europe.org/conference2025>

[2] <http://www.ada-europe.org/conference2014>

Preparations are ongoing for the next Ada-Europe conference (AEiC 2026), the 30th in the current series. It will be held in Västerås, Sweden, from 9 to 12 June 2026. The conference web-site will be online soon [3], and the Call for Contributions will be added and distributed shortly.

We reconfirm our usual hospitality agreement for WG9, ARG, HRG, and WG23, to co-locate their meetings at our conference.

Investigations are ongoing for future Ada-Europe conferences (AEiC 2027 and 2028). No decisions have been taken yet, and we remain interested in hosting proposals.

[3] <http://www.ada-europe.org/conference2026>

Production of the Ada User Journal (AUJ) [4] continues as planned. We still experience large delays due to the busy schedule of the all-volunteer Editorial Board, and more recently as well due to late/non-delivery of promised articles.

No progress has been made concerning the merger between the AUJ and Ada Letters. Therefore, the technical contents of the AUJ is still being republished in Ada Letters, which is great for authors due to the increased visibility of their work.

[4] <http://www.ada-europe.org/auj>

There's finally progress to report on the publication of the Ada 2022 Language Reference Manual by Springer in its LNCS series. As Corrigendum 1 is being finalized, plans have changed to publish a "Consolidated Ada 2022 Reference Manual". Latest prediction from Springer is they'll publish within 8 weeks of receiving the (updated) manuscript. Ada-Europe remains ready to place a group order for its interested members.

SIGPLAN HILT – Tucker Taft and Alok Srivastava

HILT is still awaiting approval by the SIGPLAN Chair.

WG 23 – Erhard Plödereder

WG23 has continued to work on the IS 24772 Parts for Java and C++. Rust is presently being discussed as a possible addition to the series. Five other Parts, among them Ada and Spark, stand ready for submission to ISO.

Regrettably, ISO has not yet reacted on the WG23 request for free availability of IS 24772 Part 1. (The original request was made more than 4 years ago. Positive signals were received, but no official approval.)

As a consequence, submission of all other Parts is still on hold.

Fortran, INCITS/PL22.3 – Van Snyder (apologies)

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Convenor's Report Activities Since the Last Session

1. I have identified the steps required for submitting the Corrigendum and Defect Reports to SC 22 for their approval. We will need a cover letter justifying the need for a corrigendum. I volunteer to write that letter. Tucker has volunteered to help.

However, note that corrigenda for programming languages are not popular with ISO above SC 22 so there is a real risk of rejection. SC 22 has been criticized for the use and number of corrigenda submitted by the committee's various Working Groups.

2. WG 9 will issue written instructions to the ARG for the overall direction of the next revision to the Ada standard. To gather inputs from both WG 9 and the community, I created (with some help) an "Issue" on the ARG GitHub site to capture the responses and discussion:
<https://github.com/Ada-Rapporteur-Group/User-Community-Input/issues/134>
It has a number of responses. Additional inputs are available at other online sites. We will refer to this GitHub site in the **Committee as a Whole** section below.
3. I have informed the SC 22 Chair and Committee Manager that WG 9 intends to develop a new edition to the Ada standard (i.e., beyond the Corrigendum). To that end, I will submit a request to SC 22 for a New Work Item (NWI) to develop the new edition. The request will be included in the annual WG 9 report submitted to SC 22 for the Plenary in September. That is the most efficient way to do it because it will allow SC 22 to vote during the Plenary. This NWI will also cancel the timeout (Sept 2026) on the three-year interval granted to WG 9 to figure out what we're going to do.

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Project Editor Reports (as needed)

IS 8652 (Information Technology--Programming Languages - Ada) (Randy Brukardt)

In compliance with resolution 44-4 of WG 9, this message is to inform you that the AIs listed below have completed Editorial Review, and are submitted to WG 9 for approval at the next meeting (meeting #90). It is expected that HODs and liaison representatives would take this opportunity to circulate these AIs for comments within their respective organizations, and return comments to the ARG as soon as feasible.

The editorial review period has just concluded, so we do not expect further changes to these AIs. Substantive comments from WG 9 organizations would probably cause the corresponding AIs to be removed from the list submitted to WG 9, as such comments are best addressed at an ARG meeting.

This represents the sixth batch of bug fixes and improvements to Ada 2022.

The AIs can be found online at <http://www.ada-auth.org/AI22-SUMMARY.HTML>.

Note that we are in the process of modernizing the format of AIs. A few AIs appear in both text and HTML formats on the Ada-Auth.org website; such AIs were converted to HTML during the deliberations and therefore the HTML version contains the current version of the AI.

Special this time: As we are also submitting a Corrigendum and associated Defect Reports, this list mainly contains approved AIs that will not be included in the Corrigendum. I am assuming that approval of the Defect Reports and Corrigendum will serve to approve all of the AIs contained therein. Note that many AIs have had classification or other relevant changes. I've included a list of the brand-new AIs included in the Defect Reports and Corrigendum below; this is for reference only.

Randy Brukardt, Project Editor, ISO/IEC 8652

ARG-approved AIs for initial WG 9 approval:

AI22-0101-1/10 2025-04-24 -- Valid_Scalars attribute is defined
AI22-0120-1/02 2024-11-01 -- Relax array aggregate restriction on nonstatic choices with others

Classification change on a previously approved AI (since this AI will not be included in the Corrigendum, WG 9 ought to approve this change separately):

AI22-0081-1/05 2024-04-18 -- Allow named notation for reduction expression arguments

Newly approved AIs that are included in the Corrigendum (these do not need separate approval, they're provided for the record only):

AI22-0113-1/06 2025-04-24 -- Usage Advice (part 3)
AI22-0114-1/02 2024-11-03 -- "Main program" is not a defined term
AI22-0115-1/05 2025-04-24 -- Usage of the prefix of the Valid attribute
AI22-0116-1/04 2025-04-24 -- Discard_Names and Put_Image
AI22-0117-1/05 2025-04-24 -- More Terms and Definitions
AI22-0118-1/04 2025-04-24 -- Put_Image for derived types with new discriminants
AI22-0121-1/04 2025-04-24 -- Internal calls in contracts of protected types
AI22-0122-1/03 2025-04-18 -- Order of finalization of components

AI22-0123-1/06 2025-03-21 -- Type of aggregates and raise expressions
AI22-0125-1/02 2025-01-10 -- Atomic_Operations and checks
AI22-0126-1/03 2025-04-24 -- Finalization order of temporary objects
AI22-0127-1/03 2025-04-18 -- Elaborate_Body is a library unit aspect
AI22-0128-1/02 2025-04-18 -- Evaluation of Relative_Deadline aspect
AI22-0130-1/03 2025-04-18 -- Capacity of Bounded Queues
AI22-0132-1/02 2025-03-24 -- Order for displaying components by default Put_Image

IS 15291 (ASIS) (Bill Thomas, Greg Gicca)

TR 15942 (Guidance for the Use of Ada in High Integrity Systems) (Alejandro Mosteo)

IS 18009 (Conformity Assessment of an Ada Language Processor) (Erhard Plödereder)

IS 18009: No activities to report; no comments received.

TS 24718 (Guide for the Use of the Ravenscar Profile in High Integrity Systems) (Alan Burns, Tullio Vardanega)

Done and freely available.

TR 24772-2 (Guidance to avoiding vulnerabilities in programming languages – Vulnerability descriptions for the programming language Ada) (Joyce Tokar)

TR 24772-6: (SPARK Part of Programming Language Vulnerabilities) (Stephen Michell, Erhard Plödereder, Tullio Vardanega)

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Rapporteur Group Reports (as needed)

Rapporteur Report ARG

Since the last report (Dec 2024), the ARG has met (electronically) three times (Jan 2025, Mar 2025, May 2025). The AIs approved at the first two of those meetings are intended for WG 9 review at this meeting. They were listed in a message Randy sent to the WG 9 mailing list on May 2. [Convenor: See the Project Editor's Report for the AIs.]

Rapporteur Report HRG

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Open Action Items and Unimplemented Resolutions

This is the "To Do" list for WG 9. Some are informal action items assigned to various participants. Some are formal resolutions, which are not yet implemented. Some items are simply in suspense awaiting action by other groups.

AI-81-3: Pat to get the WG 9 documents transferred to the ISO Documents facility, pending resolution of retaining public free access to the documents in the official ISO document system.

Status: Open. Does not look good for free access to anything other than documents that are specific to a draft.

AI-88-1: Alejandro to send a short description of the work for updating TR 15942 to Tucker and Pat, for the sake of finding a candidate to take over the work.

Status: Closed. His description of the work is as follows:

Basically, what is needed is a person that has been involved in the safety-critical processes the TR covers, able to identify the mapping between the various standards requirements and Ada features, the wider the roles played the better. If I had to itemize, the bare minimum:

- Being an accomplished current Ada programmer.
- Having as much experience as possible in some high-integrity domain.

Ideally:

- Deep knowledge of modern Ada, familiarity with new features in Ada 2022, as much hands-on practice as possible, a current developer.
- Experience with certification processes under standards such as DO-178C, IEC 61508, EN 50128, other recent standards that may be relevant.
- Experience with embedded development and Ada profiles (Ravenscar, Jorvik) and restriction pragmas.
- Familiarity with at least a couple of Ada compilers to differentiate compiler-specific issues from language issues in the build process.
- Understanding/experience with run-time resource usage and measurements (WCET, stack usage, memory leaks...).
- Previous involvement with ISO standards and documents, writing/using standards or, at least, technical documents.

AI-88-2: Pat to determine the status for IS 15291 (ASIS) and IS 18009 (Conformity assessment of a language processor)

Status: Closed. Both standards are Current. Specifically:

15291:1999 is scheduled for review in April 2026. See <https://www.iso.org/standard/27169.html>

18009:1999 is scheduled for review in October 2025. See <https://www.iso.org/standard/31051.html>

AI-88-3: Pat to send a note to Juan Antonio de la Puente to determine his wishes regarding HRG membership.

Status: Closed. Juan answered in the negative.

AI-89-1: Randy B. to get an alternate document generation installation set up by end of September 2025.

Status: Open

AI-89-2: Steve B. to identify ARG rules for defining voting and non-voting members, by June 2025 WG 9 meeting.

Status: Closed. The work has been accomplished. See section 1.4 (Determination of Voting Members) of the "ADA RAPPORTEUR GROUP PROCEDURES" document at <http://www.ada-auth.org/ai-files/minutes/ARGprc34.html>, and "ARG Procedure Updates" in the minutes of that meeting at <http://www.ada-auth.org/ai-files/minutes/min-2503.html>

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Committee as a Whole

1. We need to have an explicit resolution stating that we want to initiate another edition of the Ada standard. I (the Convenor) can then submit the request to SC 22 at the September Plenary.

2. We need to identify the focus and "big picture" directions for the document containing the WG 9 Instructions to the ARG for the next edition. These are not specific language constructs or semantics proposals.

For example, the last instructions (for Ada 202x) included the following:

The ARG is requested to pay particular attention to the following two categories of improvements:

- A. Improvements that will maintain or improve Ada's advantages, especially in those user domains where safety and security are prime concerns;
- B. Improvements that will remedy shortcomings in Ada.

Improvements of special interest in these categories are:

- Improving the capabilities of Ada on multi-core and multi-threaded architectures;
- Improving the ability to write and enforce contracts for Ada entities (for instance, via preconditions);
- Improving the use and functionality of the predefined containers;
- Improving support for Unicode in the language and predefined libraries.

The purpose of the GitHub Issue mentioned in the Convenor's Report is to capture the responses from both WG 9 and the overall Ada community. Additional inputs are available in other online sites.

The responses need to be distilled into general areas of focus, similar to the above in generality.

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Unfinished Business

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New Business

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Scheduling of Future Meetings

Per meeting #89, the October 2025 meeting will be held on Wednesday the 8th at 16:30 UTC and will be virtual.

The June 2026 meeting will be hybrid, in conjunction with the Ada Europe 2026 Conference, with specific date/time/location to be determined at the October 2025 meeting.

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Review of New Action Items

AI-90-1: Pat to submit a request to SC 22 for a New Work Item to develop a new edition to the Ada standard. The request is to be submitted via the annual WG 9 report submitted to SC 22 for the SC 22 Plenary in September.

AI-90-2: Pat to submit the Corrigenda and Defect Reports to SC 22 (with a “justifying” cover letter) to SC 22 when finalized.

AI-90-3: Randy to provide updated versions of the Corrigendum and Defect Reports documents incorporating corrections to the issues identified during the meeting.

AI-90-4: Pat to make the updated Corrigendum and Defect Reports documents available to WG 9 for review once Randy has them ready.

AI-90-5: Pat to send a Letter Ballot for the approval of the Corrigendum and Defect Reports.

AI-90-6: Tucker to instantiate a small group that will refine the community inputs into focus areas for the next revision to the language.

AI-90-7: Pat to send a note to Joyce regarding the HRG, inquiring whether she wants to remain as the Chair, and what the HRG wants to do in the future. (For example, would it want to take on the effort of revising TR 15942?)

AI-90-8: Tucker to post the need for an editor to take on the revision of TR 15942, given Alejandro’s release from the effort.

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Final Consideration of Resolutions

Resolution 90-1: The meeting minutes of meeting #89 are approved.

Resolution 90-2: WG 9 approves the AI-22 AIs previously approved by the ARG in the recent ARG report.

Resolution 90-3: WG 9 approves the classification change for AI22-0081-1/05.

Resolution 90-4: WG 9 resolves to develop a new edition of the Ada standard.

Resolution 90-5: For the sake of developing the WG 9 Instructions to the ARG for the next edition of the Ada standard, WG 9 approves creation of a small subgroup to refine the current community inputs into “big picture” goals and directions. The group consists of Steve Baird, Randy Brukardt, Robin Leroy, Tucker Taft, Tullio Vardanega, and Richard Wai. (Other WG 9 members are welcome to participate.) The result of the work is to be available no later than one month prior to the October meeting of WG 9.

Resolution 90-6:

ISO/IEC JTC 1/SC 22/WG 9 continues its Annex H Rapporteur Group (HRG) until the next plenary meeting and expresses its grateful appreciation to the Rapporteur and the members for their continuing service.

Joyce Tokar is continued as Rapporteur.

The membership of the HRG is designated to be: Steve Baird, John Barnes, Ben Brosgol, Alan Burns, Rod Chapman, Gary Dismukes, Bob Duff, Stephen Mitchell, Brad Moore, Miguel Pinho, Erhard Plödereder, George Romanski, Jean-Pierre Rosen, S. Tucker Taft, Joyce Tokar, and Tullio Vardanega.

The Convenor of WG 9 is authorized to act for WG 9 between meetings in appointing additional members of the HRG. In doing so, he shall consult with the Rapporteur and the National Body or Liaison Organization nominating the member.

Rapporteurs are permitted to allow other individuals to observe the deliberations of the Rapporteur Group. The admission of observers and the extent of participation permitted to observers are at the discretion of the Rapporteur with the concurrence of the membership of the Rapporteur Group.

Resolution 90-7:

ISO/IEC JTC 1/SC 22/WG 9 continues its Ada Issues Rapporteur Group (ARG) until the next plenary meeting and expresses its grateful appreciation to the Rapporteur and the members for their continuing service.

Steve Baird is continued as Rapporteur.

The membership of the ARG is designated to be: Raphaël Amiard, Steve Baird, John Barnes, Randy Brukardt, Alan Burns, Arnaud Charlet, Jeff Cousins, Gary Dismukes, Claire Dross, Robert Duff, Edward Fish, Christoph Grein, Niklas Holsti, Pascal Leroy, Brad Moore, Alejandro Mosteo, Jean-Pierre Rosen, Justin Squirek, Tucker Taft, Tullio Vardanega, and Richard Wai.

The Convenor of WG 9 is authorized to act for WG 9 between meetings in appointing additional members of the ARG. In doing so, he shall consult with the Rapporteur and the National Body or Liaison Organization nominating the member.

Rapporteurs are permitted to allow other individuals to observe the deliberations of the Rapporteur Group. The admission of observers and the extent of participation permitted to observers are at the discretion of the Rapporteur with the concurrence of the membership of the Rapporteur Group.

Appreciation 90-8: ISO/IEC JTC 1/SC 22/WG 9 expresses its grateful appreciation to Alok Srivastava for acting as secretary for Meeting #90.

Appreciation 90-9: ISO/IEC JTC 1/SC 22/WG 9 expresses its grateful appreciation to Pat Rogers, WG 9 Convenor, for managing the WG 9 meetings.

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References

See <http://www.open-std.org/jtc1/sc22/wg9/documents.htm> for the WG 9 Document Log, including the ability to download the documents.