

ISO/IEC JTC1/SC22/WG9 N423

Convener's Comments on:

**“Instructions to the Ada Rapporteur Group
from SC22/WG9 for Preparation of the
Amendment to ISO/IEC 8652”**



For presentation to SIGAda Conference,
12 December 2002

Revised for circulation, 20 December 2002

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Background

- The ARG (Ada Rapporteur Group) performs Ada language maintenance.
- They make recommendations for formal standardization to WG9 for national body voting.
- The ARG has been assigned the responsibility to draft the language amendment.
- In October 2002, WG9 prepared instructions to the ARG governing this work: “N412 Instructions to the Ada Rapporteur Group from SC22/WG9 for Preparation of the Amendment to ISO/IEC 8652, 10 October 2002”
- This presentation reproduces those instructions and provides my comments.



Purpose

“The ARG is instructed to prepare a working draft of an amendment to ISO/IEC 8652. The main purpose of the Amendment is to address identified problems in Ada that are interfering with Ada's usage or adoption, especially in its major applications areas (such as high-reliability, long-lived real-time and/or embedded applications and very large complex systems). The resulting language changes may range from relatively minor, to more substantial.”

This presentation quotes the complete text of the instructions.

- The purpose of amendment is to address identified problems. WG9 rejected wording calling for language update and support of new paradigms.
- The phrase “usage or adoption” suggests appeal to both current and prospective users.
- Ada’s “major application areas” are identified.
- Substantial language changes are permitted. This wording steers a middle course between requiring substantial change and prohibiting substantial change.

In some cases, I offer my comments on the intent or significance of the instructions.



Two Specific Improvements

“Examples of worthwhile changes are:

- inclusion of the Ravenscar profile;
- inclusion of a solution to the problem of mutually dependent types across packages.”

WG9 makes two specific requests of the Amendment:

- Ravenscar Profile
- Solving problem of mutually dependent types



Two Categories of Improvement

“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 criticality are prime concerns;
- (B) Improvements that will remedy shortcomings in Ada.”

- Amendment should build on Ada's advantages, particularly for safety and criticality.
- Amendment should remedy shortcomings. WG9 removed the words “with respect to other languages” suggesting that we should not focus on feature-by-feature matchup with other languages.



Suggested Prioritization (1 of 3)

“Improvements in the real-time features are an example of (A) and should be considered a high priority. Improvements in the high-integrity features are an example of (A) and should be considered a high priority. Features that increase static error detection are an example of (A) and should be considered a priority, but less important than the two listed above. Improvements in the facilities for interfacing to other languages are an example of (A) and should be considered. Improvements in the object-oriented features—specifically, adding a Java-like interfaces feature and improved interfacing to other OO languages—are an example of (B) and should be considered.”



Suggested Prioritization (2 of 3)

- (A) Build on Ada's advantages, particularly for safety and criticality
 - Real-time features
 - High-integrity features
 - Static error detection
 - Interfacing to other languages
- (B) Remedy shortcomings
 - Object-oriented features—specifically, adding a Java-like interfaces feature and improved interfacing to other OO languages



Suggested Prioritization (3 of 3)

The instructions create three priority levels:

- High Priority
 - Real-time features
 - High-integrity features
- A priority but less important
 - Increase static error detection
- Should be considered
 - Interfacing to other languages
 - Object-oriented features—specifically, adding a Java-like interfaces feature and improved interfacing to other OO languages

This list is notable, not only for the prioritization, but also for what is missing. WG9 considered adding “design by contract features” to the list but decided not to add it. No other categories of features were considered.



Considerations in Selection

“In selecting features for inclusion in the amendment, the ARG should consider the following factors:

- Implementability (vendors concerns). Can the proposed feature be implemented at reasonable cost?
- Need (users concerns). Does the proposed feature fulfill an actual user need?
- Language stability (users concerns). Would the proposed feature appear disturbing to current users?
- Competition and popularity. Does the proposed feature help improve the perception of Ada, and make it more competitive with other languages?
- Interoperability. Does the proposed feature ease problems of interfacing with other languages and systems?
- Language consistency: Is the provision of the feature syntactically and semantically consistent with the language's current structure and design philosophy?”

“Uniqueness and innovation” was considered as a criterion, but was not included.



Backwards Compatibility

“In order to produce a technically superior result, it is permitted to compromise backwards compatibility when the impact on users is judged to be acceptable.”

- Compromise of compatibility may be considered.
- It was difficult to reach agreement on wording here. I interpret this instruction as saying that the Amendment is permitted to be less strict than the Ada 95 revision in maintaining backward compatibility.
- The voting on this section was close, suggesting that “acceptable impact” may be closely judged.



Secondary Standards

“The use of secondary standards should be minimized; secondary standards should be proposed only when they would include material so important as to require standardization but so voluminous as to preclude inclusion in the Ada language standard. In particular, material similar to the current ISO/IEC 13813, Generic Packages of Real and Complex Vector and Matrix Type Declarations and Basic Operations for Ada, should be incorporated into the language standard.”

- Minimize secondary standards.
- A rationale for use of secondary standards is provided.
- Move function of ISO/IEC 13813 into the language standard.



Schedule (1 of 2)

“WG9 targets the following schedule for the development of the amendment:

- Dec 2002: Presentation at SIGAda, providing for discussion groups and feedback.
- Jun 2003: Similar presentation at Ada-Europe
- Sep 2003: Receipt of the final AIs from groups other than WG9 or delegated bodies
- Sep 2003: Presentation at IRTAW
- Autumn 2003: Presentation at SIGAda
- Dec 2003: Receipt of the final AIs from WG9 or delegated bodies



Schedule (2 of 2)

- “Jun 2004: WG9 approval of the scope of amendment (perhaps by approving AIs, perhaps by reviewing draft amendment)
- Informal circulation of draft, receipt of comments and preparation of final text
- Spring 2005: Completion of proposed text of amendment to be contributed to WG9
- Mid 2005: WG9 email ballot
- 3Q 2005: SC22 FPDAM ballot
- Late 2005: JTC1 FDAM ballot.”



Results

- Most notable result is the repeated emphasis on safety and criticality as Ada's niche.
- Despite spirited discussion, WG9 approved the instructions by a unanimous vote of all nations who cast a ballot (six of them).