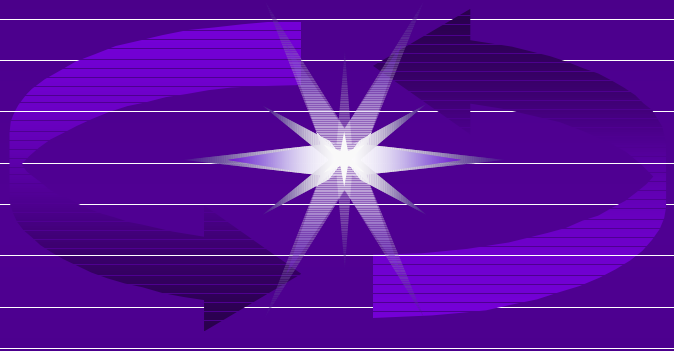
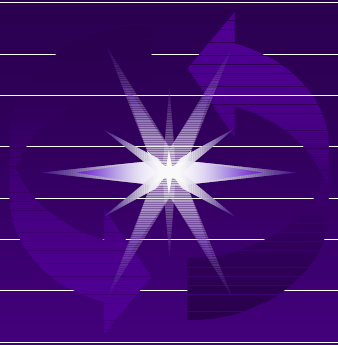
Prepared for the:
SIGAda Conference, 14 November 2000



Ada Standardization: Status and Issues

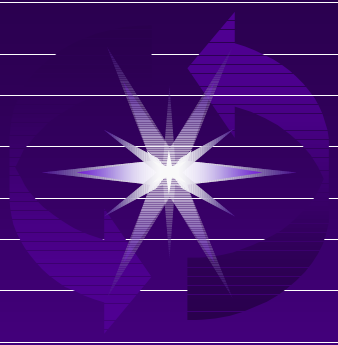
James W. Moore
The MITRE Corporation

The views and opinions expressed in this presentation are those of the author and do not represent MITRE or the Department of Defense.



Scope of Presentation

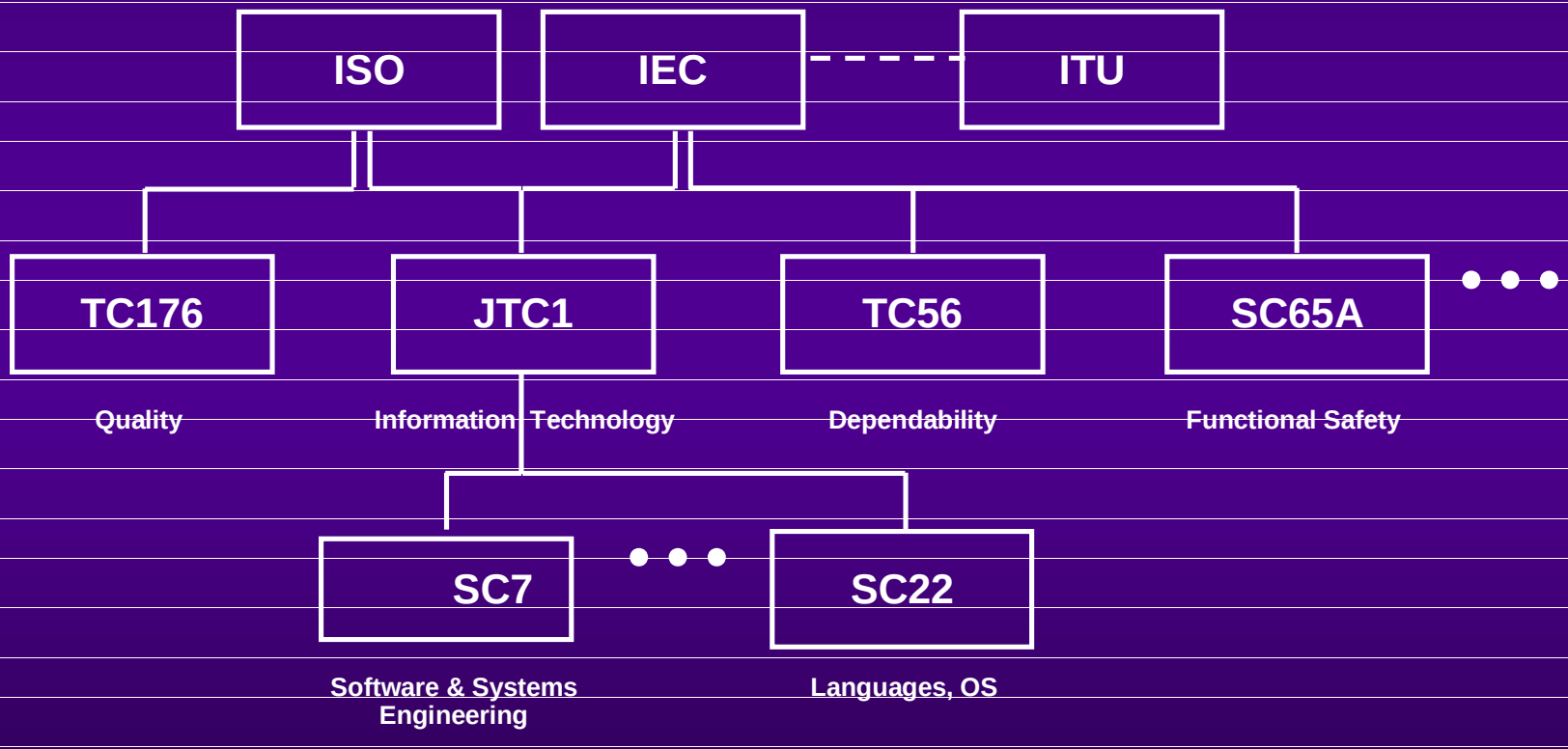
- Standardization
  - Who makes standards?
  - How are they made?
- Ada Standards
  - Status
  - Plans



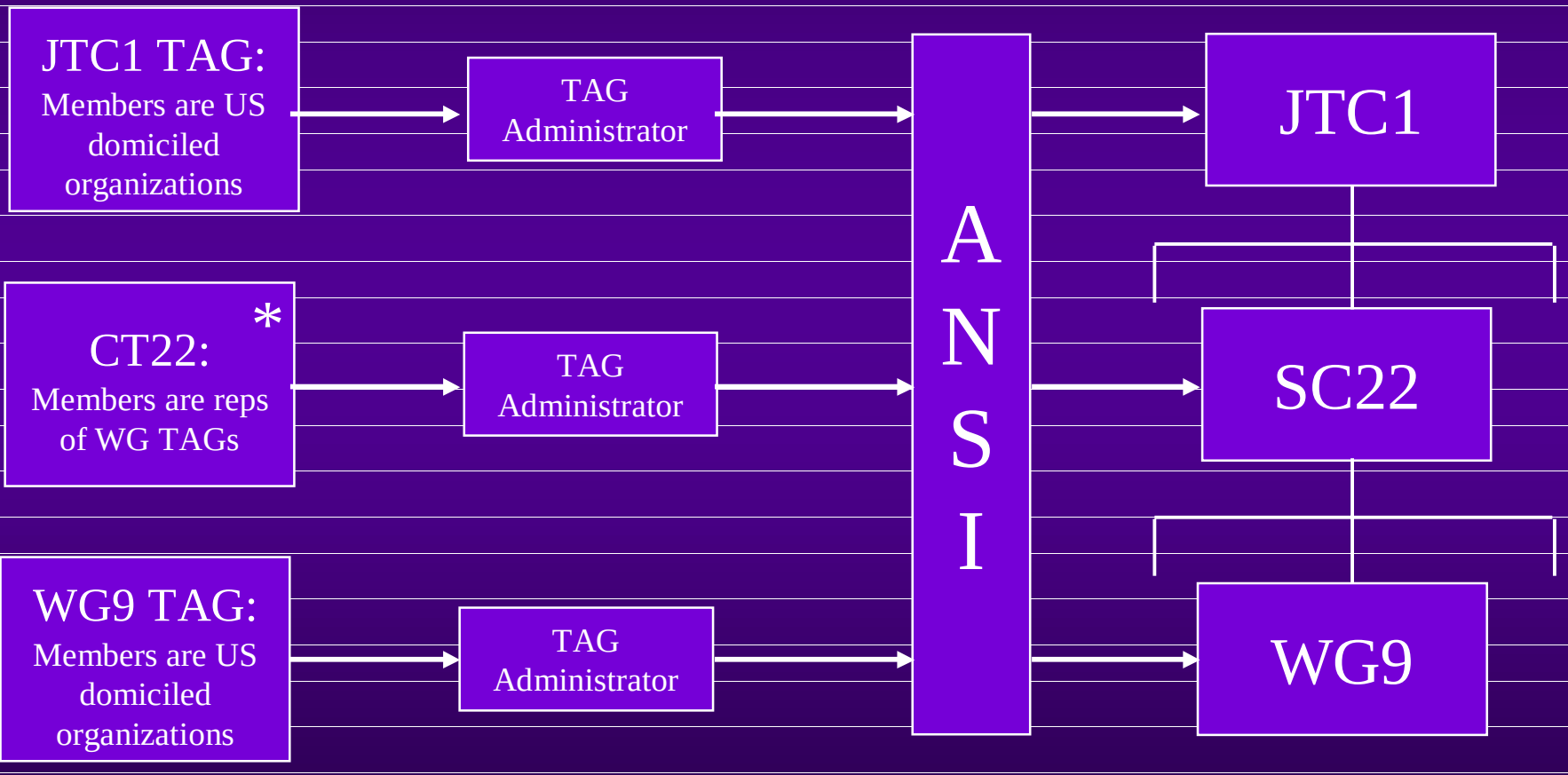
Who Makes Standards?

- *De jure* standards are formal standards made by organizations authorized, in some way, to make them. Examples include ISO and IEEE standards.
- *De facto* standards (more properly called specifications) are those recognized by the marketplace as important. Examples include OMG CORBA, Windows API.

Developers of International Standards

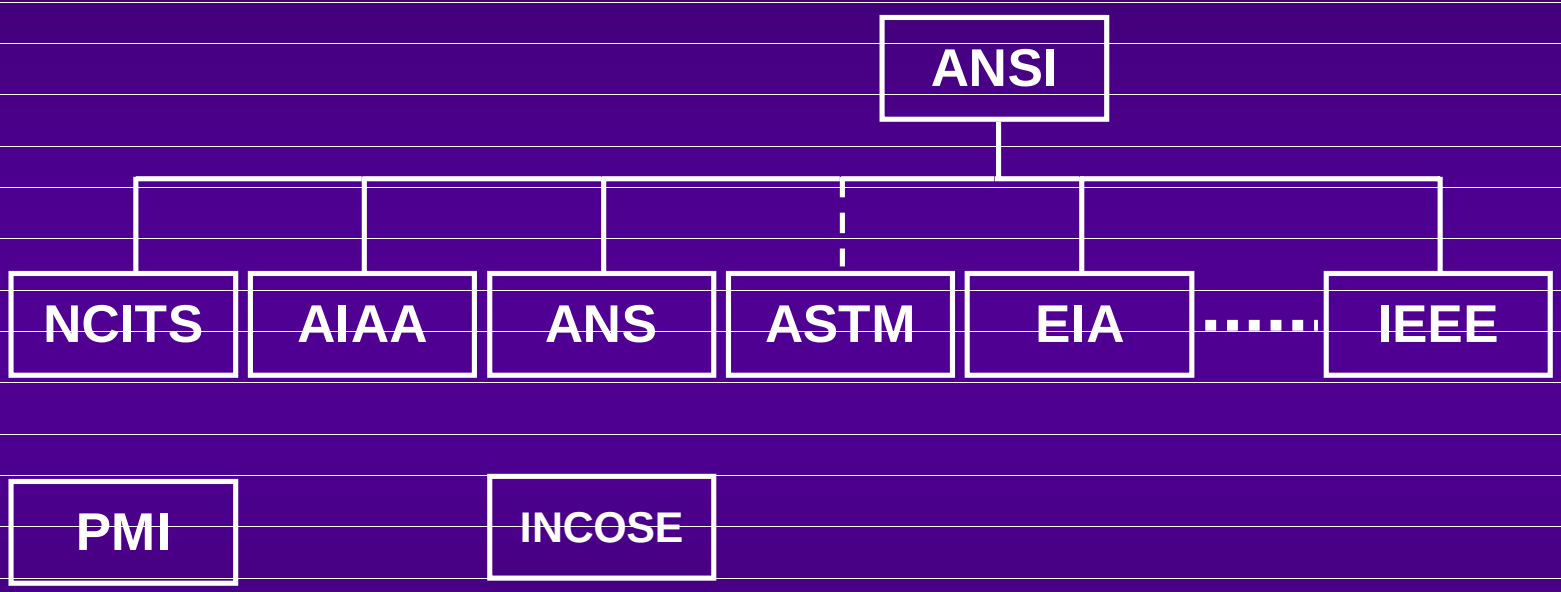


How the US is Represented in JTC1, SC22 and WG9



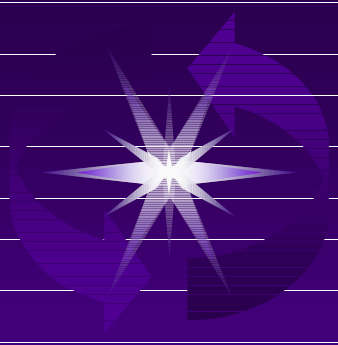
* Caution: This is a *unique* arrangement.

Developers of US Standards



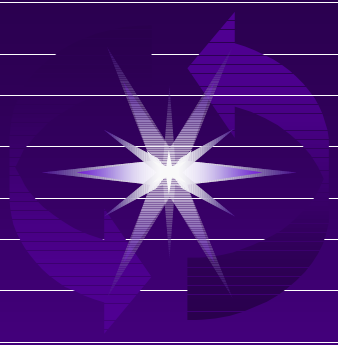
About 550 organizations in the U. S. make standards.

About half of them are accredited by ANSI, allowing them to participate in international standardization activity.



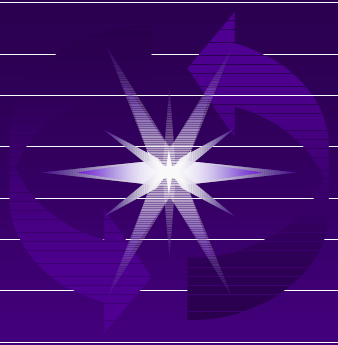
Three Ways to Make a US Standard

- *Accredited Standards Organization:* An organization that does many things including making standards, e.g. IEEE.
- *Accredited Standards Committee:* An organization created purely for the purpose of making standards, e.g. X3.
- The *Canvass* method



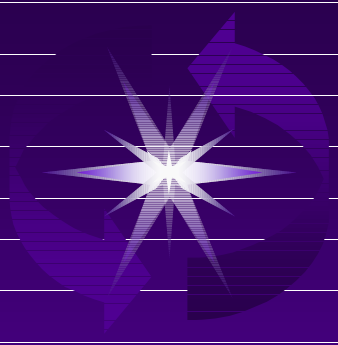
What Sort of Standard is Ada?

- Ada is an international standard, approved by JTC1:
  - Originally in 1987
  - Revision in 1995
- Ada is an ANSI standard, developed via the Canvass method
  - Originally in 1983
  - Revision in 1995



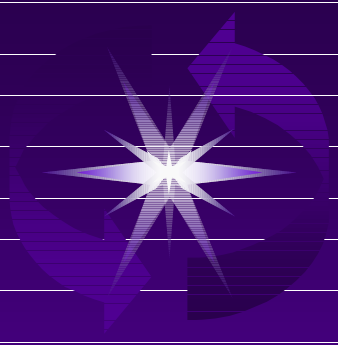
International Standards

- The International Organization for Standardization (*ISO is not an acronym*) teamed with International Electrotechnical Commission (IEC) in 1986 to set up a Joint Committee (JTC1) with the scope of Information Technology



JTC1: Membership

- "National Bodies": Each country is represented by their statutory national standards organization. (Exception: The US is represented by ANSI.)
- *P-Members* (Participating Members) each have one vote.
- *O-Members* (Observing Members) are provided with all information.

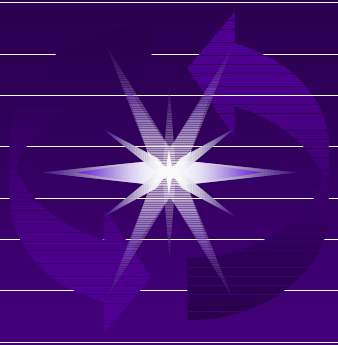


JTC1: Structure

Technical Direction	Subcommittees
Cultural and Linguistic Adaptability and User Interfaces	SC22/WG20 - Internationalization SC35 - User Interfaces
Data Capture and Identification Systems	SC02 - Coded Character Sets SC31 - Automatic Identification and Data Capture Techniques SC17 - Cards and Personal Identification
Data Management Services	SC32 - Data Management and Interchange
Document Description Languages	SC34 - Document Description and Processing Languages
Information Interchange Media	SC11 - Flexible Magnetic Media for Digital Data Interchange SC23 - Optical Disk Cartridges for Information Interchange
Multimedia and Representation	SC29 - Coding of Audio, Picture, and Multimedia and Hypermedia Information SC24 - Computer Graphics and Image Processing
Networking and Interconnects	SC25 - Interconnection of Information Technology Equipment SC06 - Telecommunications and Information Exchange between Systems
Office Equipment	SC28 - Office Equipment
Programming Languages and System Interfaces	SC22 - Programming Languages, their Environments and Systems Software Interfaces
Security	SC27 - IT Security Techniques
Software Engineering	SC07 - Software Engineering
TBD	SC36 - Learning Technology

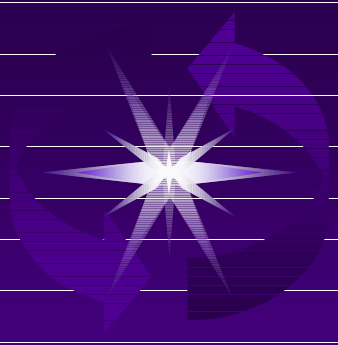
SC22: Programming Languages, Environments, System SW Interfaces

- Programming Languages
  - WG3, APL
  - WG4, COBOL
  - WG5, Fortran
  - WG9, Ada
  - WG13, Modula-2
  - WG14, C
  - WG16, ISLisp
  - WG17, Prolog
  - WG21, C++
- Environments
- System Software Interfaces
  - WG15, POSIX
- Other
  - WG11, Binding Techniques
  - WG19, Formal Specification Languages
  - WG20, Internationalization
- Lingering responsibility for Pascal, Algol, PL/I, Basic, FIMS, PCTE, CHILL, MUMPS, Extended BNF, Forth



WG9: Ada Programming Language

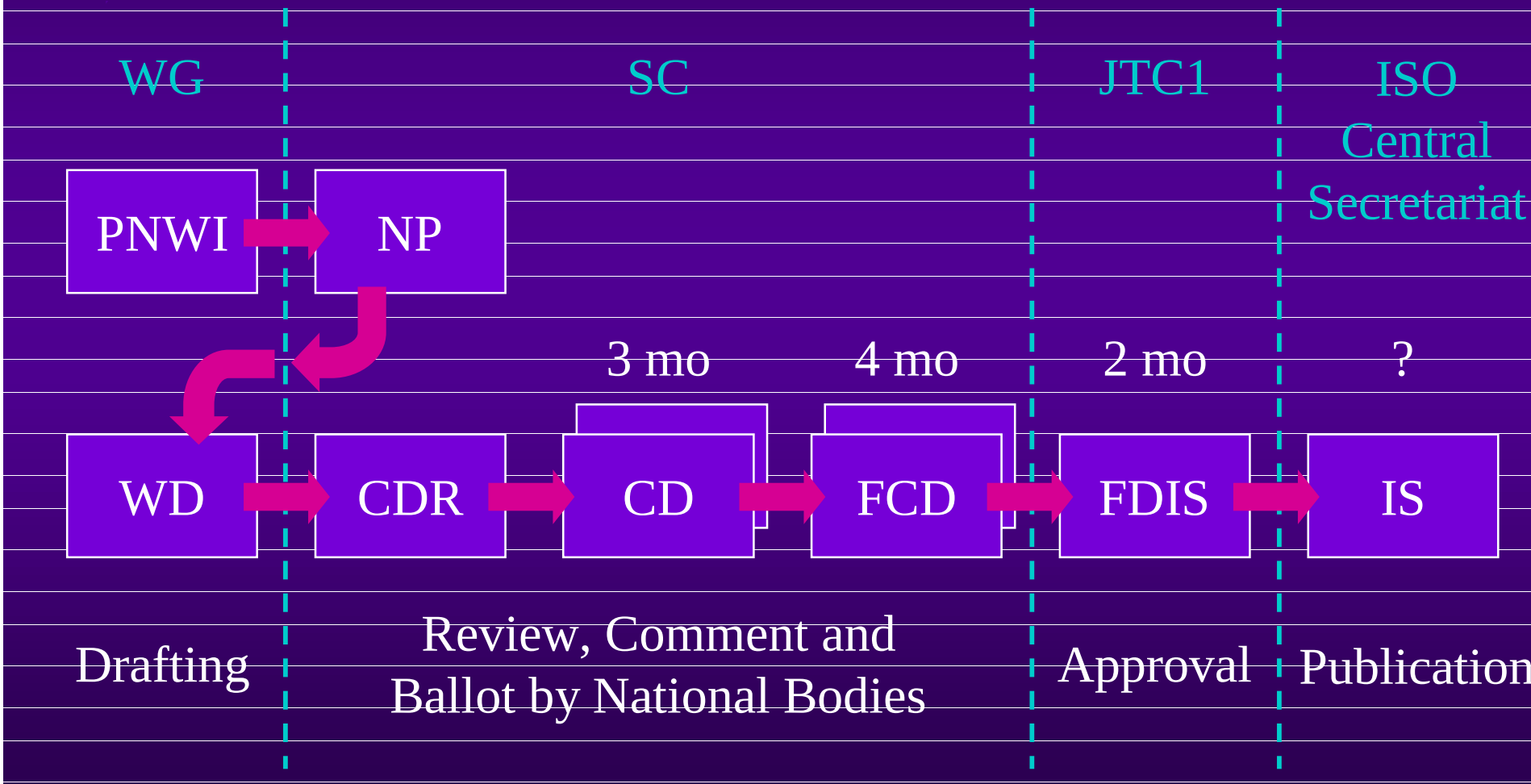
- Active Member Bodies: Canada, Germany, Japan, Switzerland, UK, USA
- Rapporteur Groups
  - Ada: Language maintenance
  - Annex H: High integrity systems
  - ASIS: Library interfaces



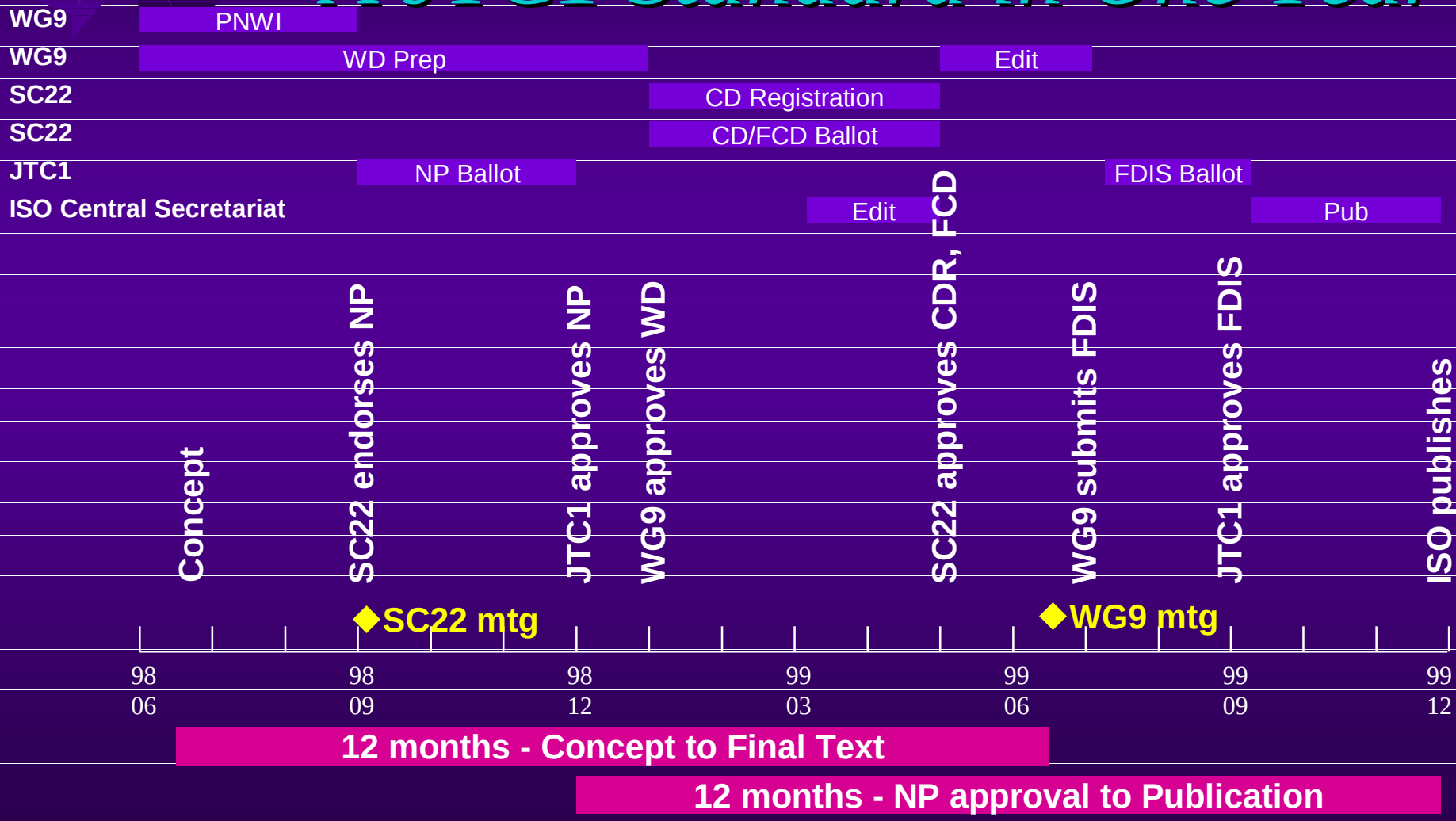
International Standards and Technical Reports

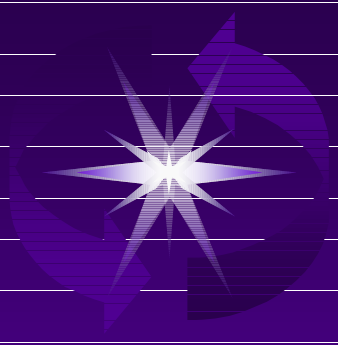
- *International Standard* (sometimes called IS): A normative document
- *Technical Report* (often called TR): Any document that is *not* normative:
  - Type 1: A document that failed to achieve consensus
  - Type 2: A document on which work continues
  - Type 3: Material not suitable for standardization, e.g. a reference model

How are International Standards Made?



ISO/IEC 18009: A JTC1 Standard in One Year





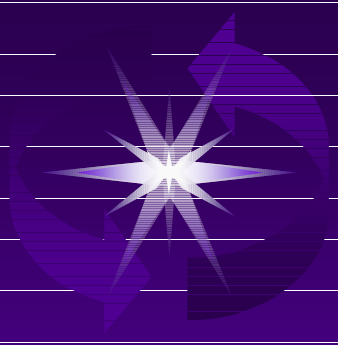
Language Standards

- ISO/IEC 8652:1995, IT--Programming Languages--Ada

  The Ada Language Reference Manual
- Technical Corrigendum to ISO/IEC 8652

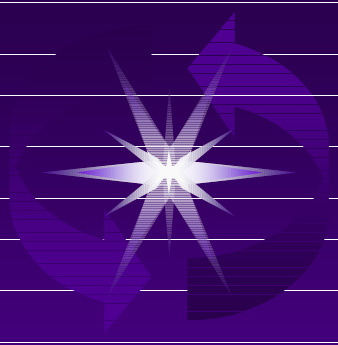
  Formal disposition of many of the "Ada Issues"
- ISO/IEC 18009:1999, Conformity Assessment of an Ada Language Processor

  The replacement for "compiler validation".



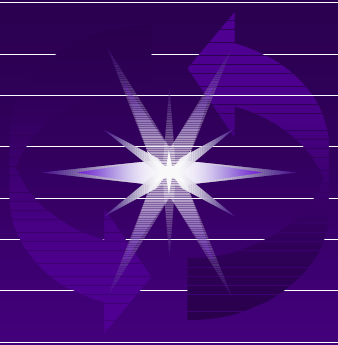
Plans for Language

- Technical Corrigendum 1 will be approved this year by SC22.
- Another CORR is planned circa 2003.
- Language revision will be considered circa 2005.



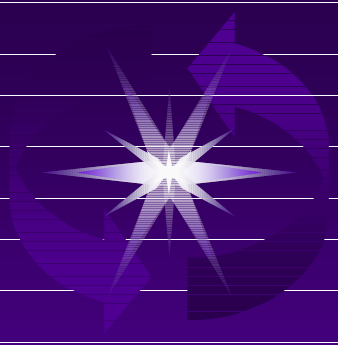
Numerics Standards

- ISO/13813:1998, IT--Programming Languages--Generic Packages of Real and Complex Type Declarations and Basic Operations for Ada (including Vector and Matrix Types)
- ISO/13814:1998, IT--Programming Languages--Generic Package of Complex Elementary Functions for Ada



Integrity Standards

- ISO/IEC TR 15942:2000, Guidance for the Use of Ada in High Integrity Systems
- Refers to 15 standards from other areas of ISO, IEC, JTC1 and other bodies, including:
  - IEC 880, Software for computers in the safety systems of nuclear power stations
  - IEC 61508, Functional safety: Safety-related systems
  - ISO/IEC 15026, System and software integrity levels
  - ISO/IEC 15408, Evaluation criteria for information technology security



ASIS Standards

- ISO/IEC TR 15291:1999, IT--Programming Languages--Ada Semantic Interface Specification (ASIS)