Status of the ISO-STEP Initiative for CGNS-Based Fluid Dynamics Standard

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What Is STEP?

- STEP is an acronym
  - STandard for the Exchange of Product model data
- Formal name is ISO 10303
  - Industrial automation systems and integration
  - Product data representation and exchange
  - Intended (eventually) to cover the complete life cycle of all industrial products
- **PDES** is Product Data Exchange using STEP.
  - PDES is the U.S. effort, administered through the IGES/PDES organization, to support the development and deployment of the international STEP standard.

STEP Approach

- The most viable solution:
  - public NOT proprietary data model;
  - supports extension for additional application;
  - has publicly defined interface/access mechanisms;
  - usable and stable over the life span of the products and their supporting information;
  - designed and validated to industry defined needs;
  - allows CAD/CAM/CAE industry to construct a compatible suite of engineering software.

Four Levels of Exchange

- **Level 1 - Physical file transfer**
  - communication between two remote processes in which data is exchanged via a sequential file of an agreed upon format.
- **Level 2 - Shared memory access exchange**
  - communication between two concurrent processes in which data is exchanged via agreed upon data access processes. There is no assertion of data persistence.
- **Level 3 - Shared database access exchange**
  - communication between two or more asynchronous processes in which data is exchanged via agreed upon access processes to a persistent data repository.
- **Level 4 - Knowledge-based data exchange**
  - communication between two or more asynchronous processes in which data is exchanged via agreed upon access mechanisms to a persistent repository supporting both product data and knowledge of processes related to use of that data. Further definition of this concept and any supporting activity is a future work item.

Differences between ISO-STEP and CGNS

ISO-STEP is based on…

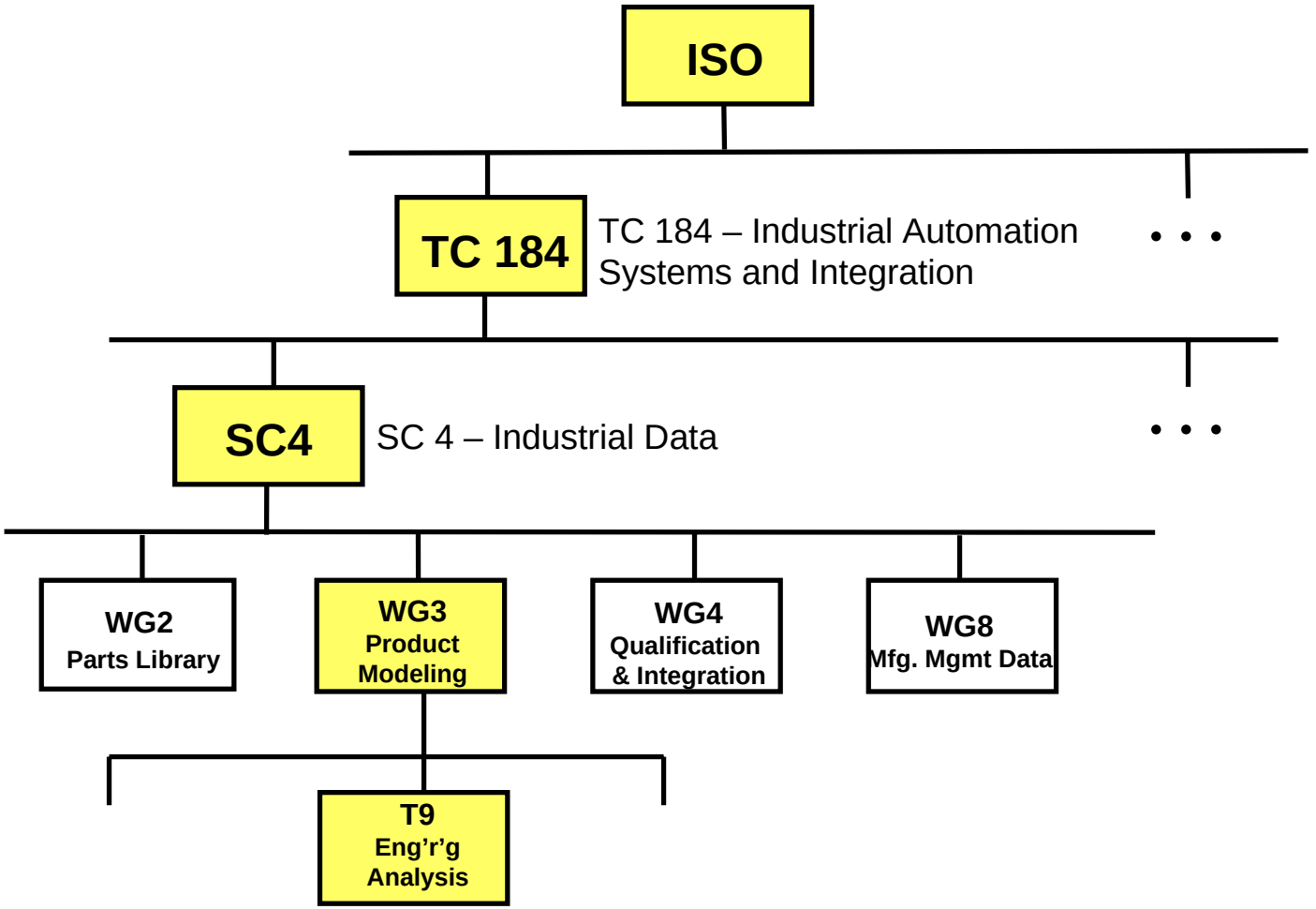
- Strong link to Product Data Management
  - Record of all data sources, persistent links if possible.
- Commonality and re-use of existing data structures to maximum extent possible
  - E.g., re-use data structures from AP203 (geometry), AP209 (finite element analysis), and AP232 (technical data exchange)
- ASCII data exchange
  - We will need to extend ISO-STEP to provide binary data exchange as an option

Major Events

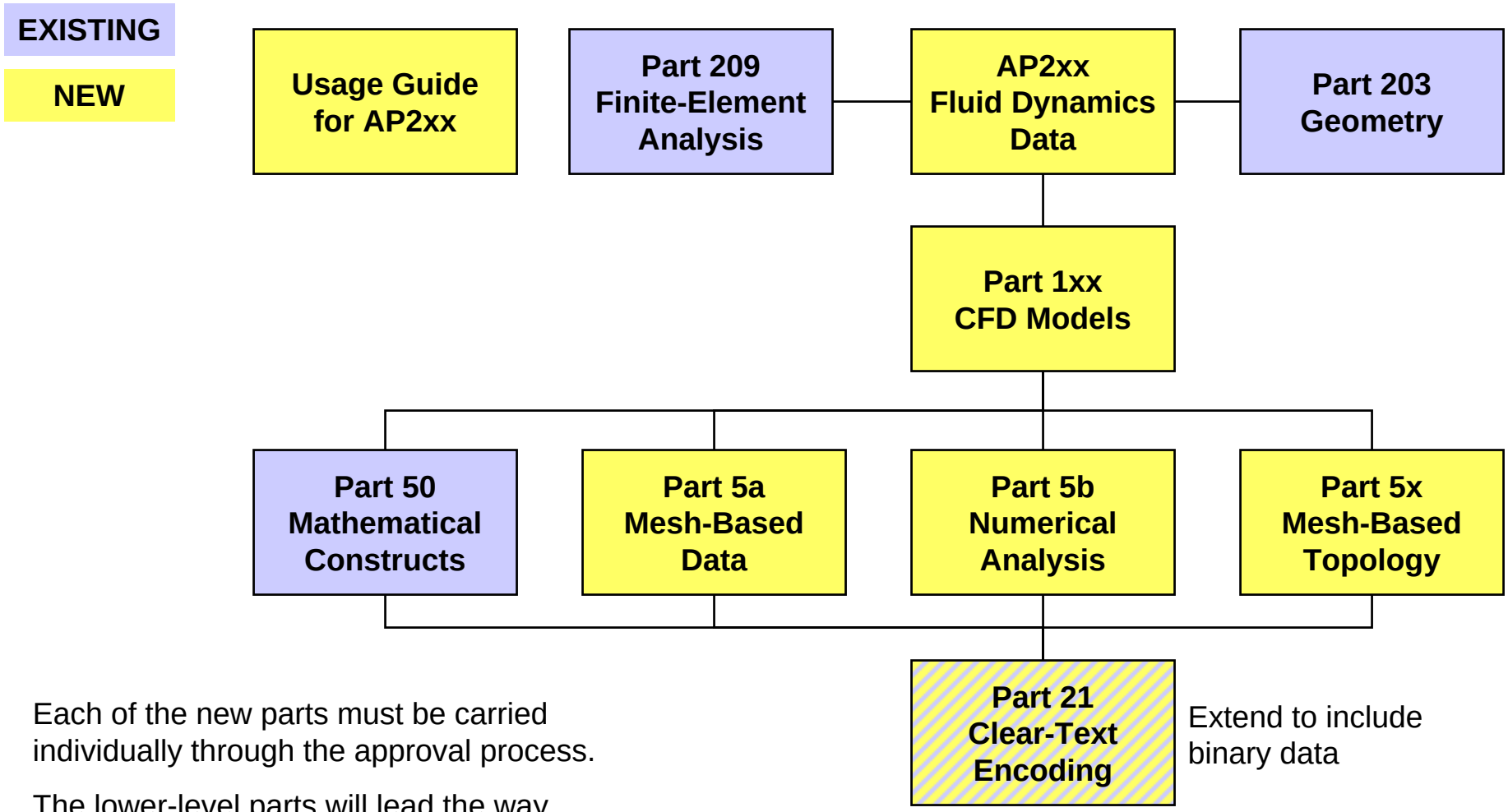
Since previous committee meeting, June 2000

- Review draft ISO-STEP standard with CGNS Steering Team members (July 6-7, Seattle, WA)
  - General approval of then-current state; some issues identified
- Initial draft of standards documentation completed (Sept 2000)
  - Work mainly accomplished by Peter Wilson (Boeing – Seattle)
  - Incomplete, but contains all technical content of SIDS as of August 2000
- ISO meeting (October 16-20, Charleston, SC)
  - Cosner presentation to Change Management Board
    - Focused on scope, component parts, schedule of the Fluid Dynamics AP
- Technical Workshop (December 11-14, Seattle, WA)
  - Define the structure of the Fluid Dynamics AP
  - Continue defining the organization and content

ISO Organization



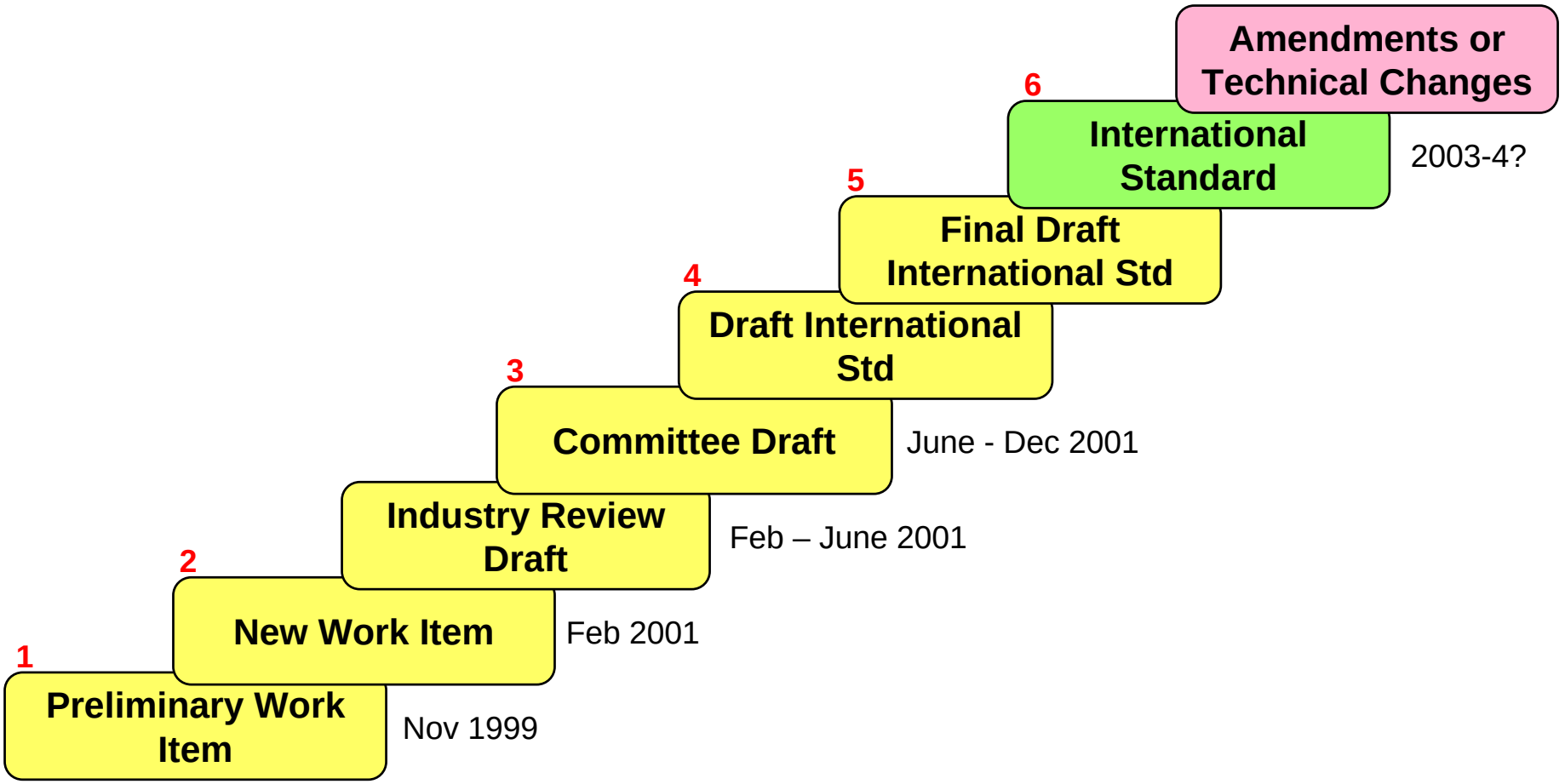
Structure of the Fluid Dynamics Standard



Each of the new parts must be carried individually through the approval process.

The lower-level parts will lead the way.

STEP Standards Development Life Cycle



Approval Process

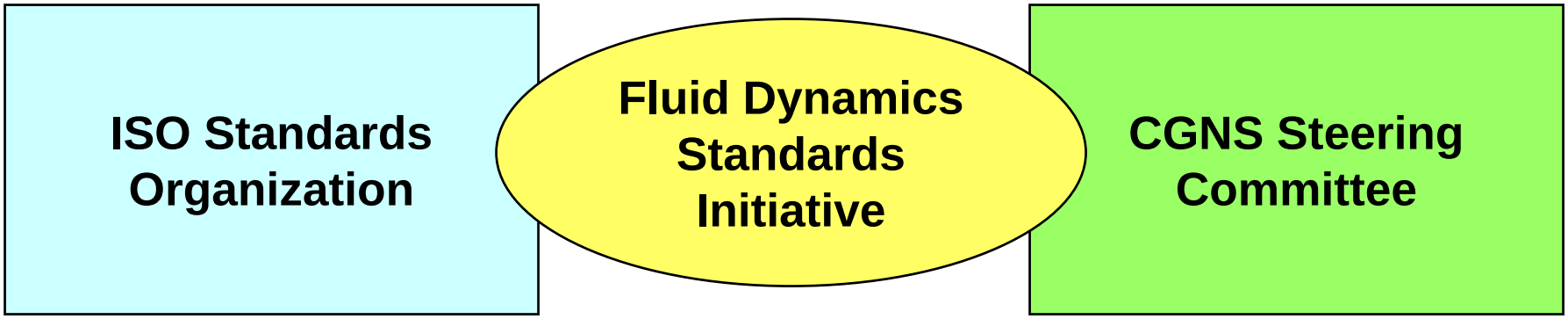
- Passage through each “gate” requires a specified number of favorable votes
  - One country = one vote
  - P-Member countries are voting members (there also are observers)
- Required number of votes becomes more stringent at each “gate”

- **To gain approval, it is essential to have supporters in most (all) of the P-member countries**
  - **There are CGNS users in each P-member country**

P-Member Countries

- Australia
- Canada
- China
- France
- Germany
- Italy
- Japan
- Korea (Republic of)
- Netherlands
- Norway
- Portugal
- Russia
- Spain
- Sweden
- Switzerland
- United Kingdom
- United States

Operating Relationships



- Integrate the fluid dynamics standard requirements with other ISO standards

- Map the CGNS content into the ISO process
- Build international support

- Intellectual content of the CGNS standard (SIDS)
- ADF libraries
- Mid-level libraries