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

Presented to the AIAA CGNS Subcommittee

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Objective

- Establish an ISO-STEP standard for representation, storage, and exchange of digital data in fluid dynamics

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.

Strategy

- Adapt CGNS as the kernel of an ISO standard for storage and exchange of digital data in fluid dynamics
  - Utilize current CGNS structure and concepts to the maximum extent that is practical
  - Use current CGNS user base as core supporters for the ISO Fluid Dynamics AP development

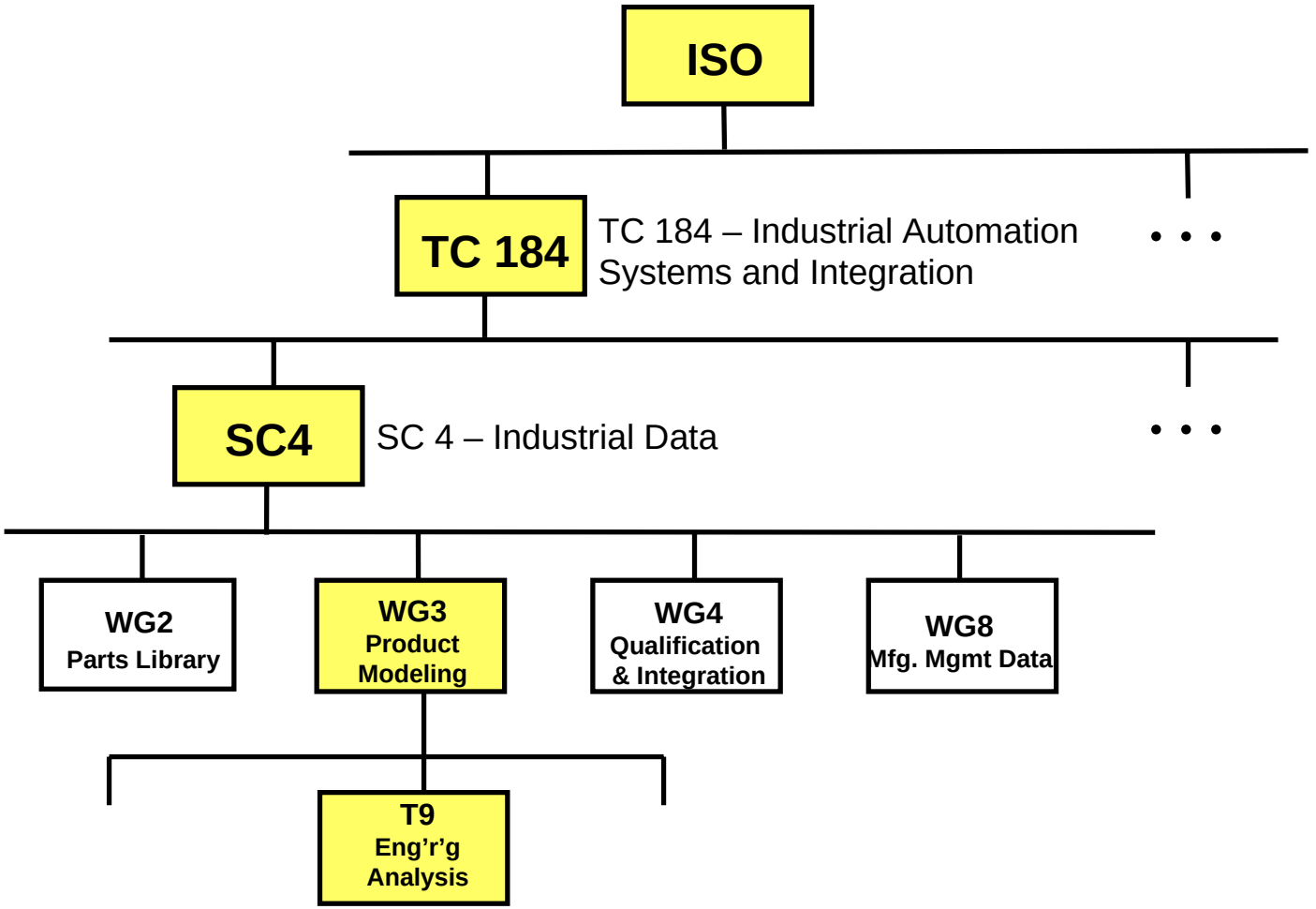
- Utilize a two-stage strategy
  - First: Establish an AP for CFD data
    - Build on existing CGNS, which is fairly mature for CFD
  - Second: Extend the AP to other types of fluid dynamics data
    - Wind tunnel, flight test, hydrodynamics, etc.

Differences between ISO-STEP and CGNS

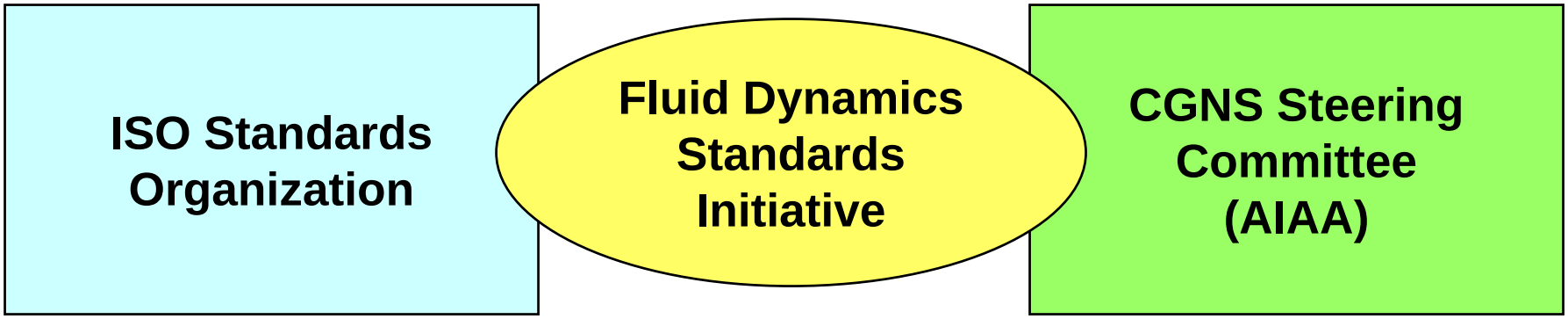
ISO-STEP is based on…

- 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)
  - As we create new data structures, attempt to anticipate future use of those data structures by other disciplines
- ASCII data exchange
  - We will need to extend ISO-STEP to provide binary data exchange as an option

ISO Organization



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

We will work with on the existing CGNS Steering Committee, and the users they represent, to build international consensus for the proposed standard.

Recent Events

Since previous committee meeting, June 2001

- Extensive rewrite of all four parts (completed Aug-Sept 2001)
- Page-by-page review at ISO SC4 meeting (Fukuoka, Japan, 1-5 October 2001)
- Now incorporating all pending comments
  - To be completed early February 2002

Future Events

- ISO SC4 Meeting – Myrtle Beach, SC - February 25 – March 1, 2002
  - Hope to release Part 52 to Committee Draft ballot
    - First public release of a complete draft standard
    - This initiates the formal process of responding to all comments for Part 52
  - Page-by-page review of all four parts
- ISO SC4 Meeting – Stockholm, Sweden – June 2002
  - Hope to release Parts 53 and 110 to Committee Draft ballot
  - Page-by-page review of all four parts
- ISO SC4 Meeting – Seoul, South Korea – November 2002
  - Page-by-page review of all four parts

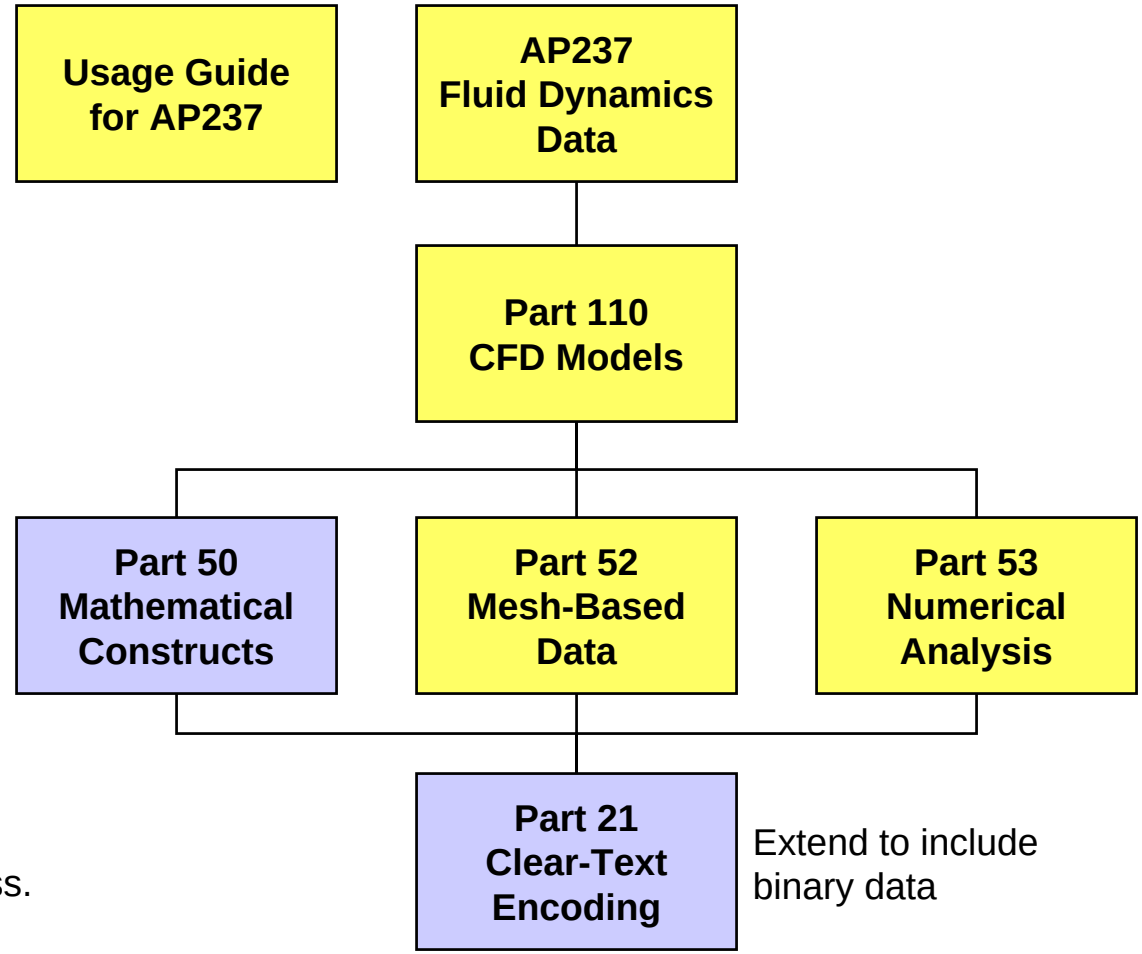
Question

- Is there any interest in holding a workshop with members from this Committee for a detailed review of AP 237 and the derivative parts?
  - At least two days
  - Participants – CGNS Steering Committee and representatives of the AP 237 project
  - Spring 2002
  - Somewhere in the US
    - Hartford CT?
    - Seattle WA?
    - St Louis MO?
    - Reston VA (AIAA HQ)?
    - Fort Worth TX?

Structure of the Fluid Dynamics Standard

EXISTING

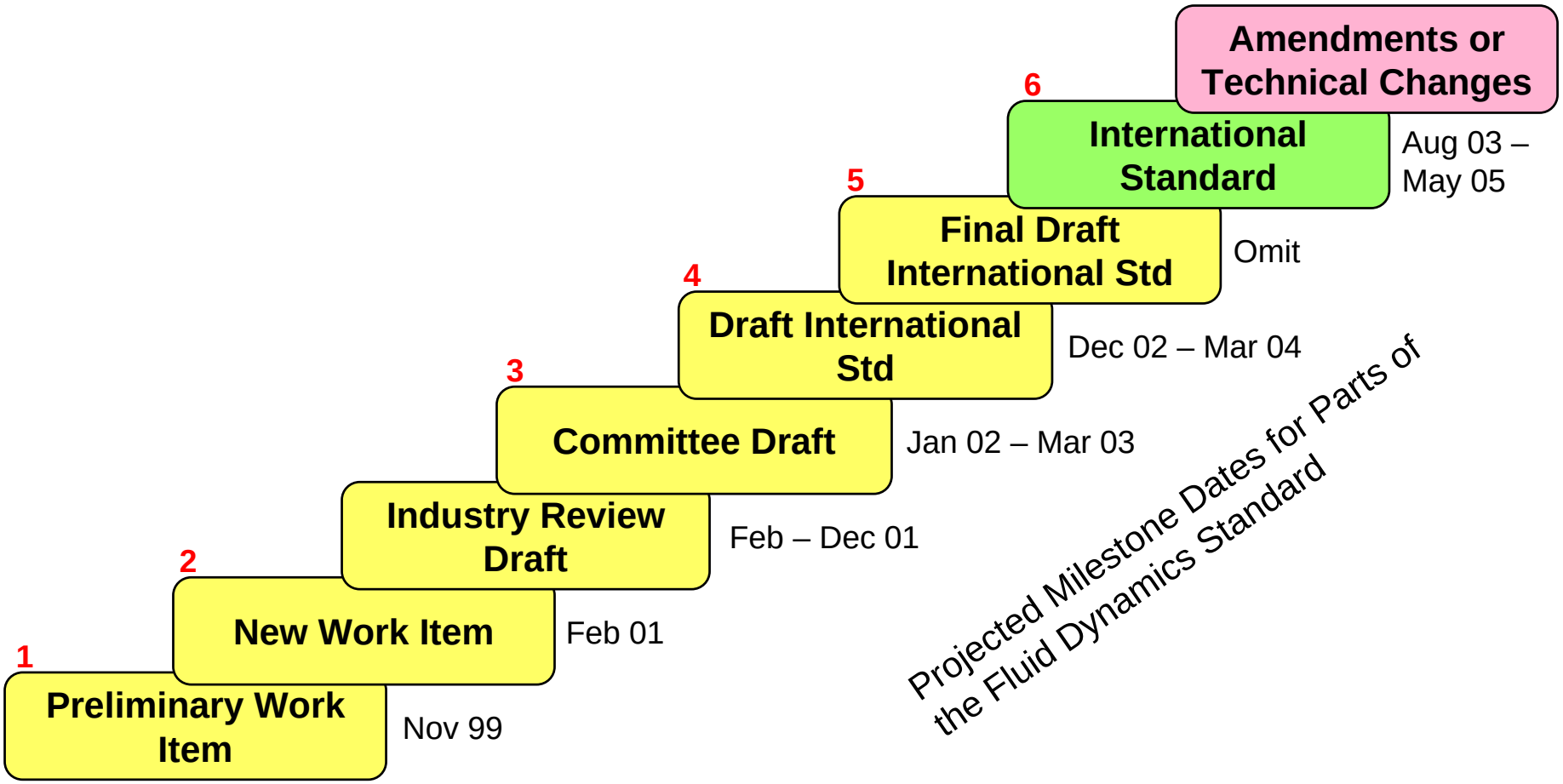
NEW



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

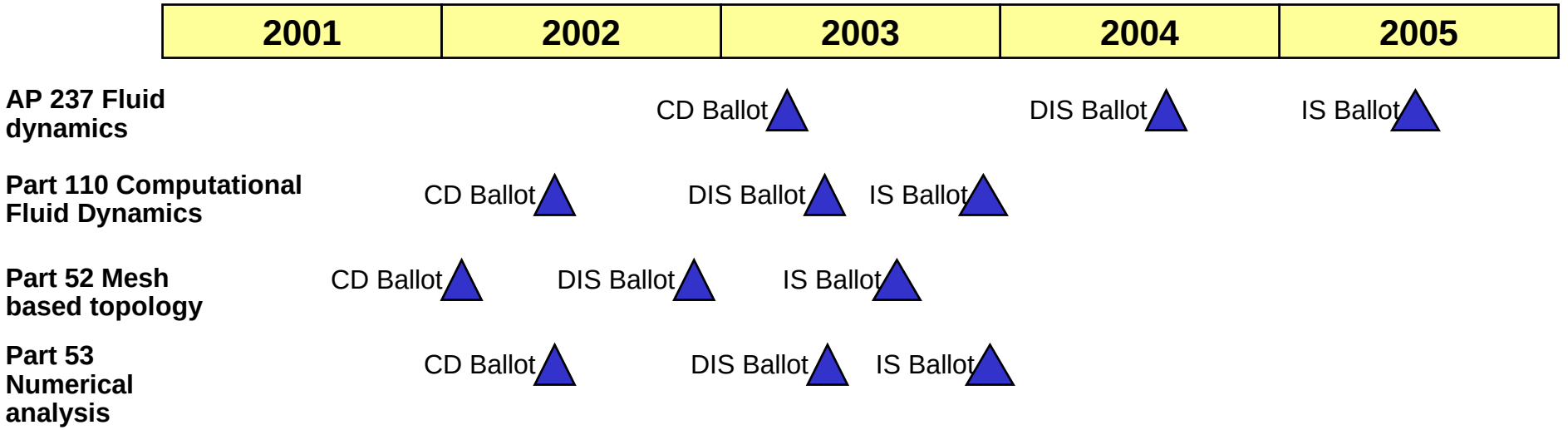
- Passage through each “gate” requires a specified number of favorable votes
  - One country = one vote
  - P-Member countries are voting members (there also are observers)
- Required number of votes becomes more stringent at each “gate”

- **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

AP 237 Fluid Dynamics Schedule for Related Document Deliverables



Schedule reviewed and updated October 4, 2001