

# **STEP Shipbuilding Interoperability Forum**

- **Panel Chairperson:**
  - **Dr. Burton Gischner**
- **Panel Vice-Chairperson and Forum Leader:**
  - **Dr. Gerald Radack**

# **STEP Shipbuilding Implementation Forum**

- **PDES, Inc. and ProSTEP (in Europe) hold CAx Implementer's Forums for STEP AP 203 implementations every six months**
- **STEP Shipbuilding Implementation Forums are based on this model**
  - **Run under auspices of NSRP Systems Technology Panel**
  - **Conducted in conjunction with Panel Meetings at same location approximately 3 times per year**
  - **Panel funds logistics and runs forum**
  - **Results are reported at ISO TC184/SC 4/WG 3/T 23 Meetings**
  - **Participation by implementers of STEP shipbuilding APs is crucial to success of this endeavor**

# **Guidelines for STEP Shipbuilding Implementation Forums**

- Led by Panel Vice-Chairperson – G. Radack**
- Assisted by Panel Chairperson – B. Gischner**
- Primary goal is to improve translators and help enhance interoperability among shipyard CAD systems**
  - Translators tested will be latest available, not released or production software**
- Results will be reported as to percent of successful transfers, which test problems caused difficulties, etc.**
  - Problems will not be assigned to particular systems or vendors**
- Panel will fund:**
  - Meeting room and refreshments**
  - Any outside help needed to evaluate results or organize forums<sub>3</sub>**

# Participating Systems in STEP Shipbuilding Implementation Forums

- **Preprocessors**

| <b>– <u>SYSTEM</u></b> | <b><u>COMPANY</u></b>               |
|------------------------|-------------------------------------|
| <b>LEAPS</b>           | <b>NSWCCD/Product Data Services</b> |
| <b>ShipConstructor</b> | <b>ShipConstructor</b>              |
| <b>ISDP</b>            | <b>Intergraph</b>                   |
| <b>COMMANDS</b>        | <b>Electric Boat</b>                |

- **Postprocessors**

|                                     |                                     |
|-------------------------------------|-------------------------------------|
| <b>– LEAPS</b>                      | <b>NSWCCD/Product Data Services</b> |
| <b>ShipConstructor</b>              | <b>ShipConstructor</b>              |
| <b>SmartMarine</b>                  | <b>Intergraph</b>                   |
| <b>COMMANDS</b>                     | <b>Electric Boat</b>                |
| <b>Product Information Explorer</b> | <b>LSC</b>                          |

- **Viewers**

|                            |                                    |
|----------------------------|------------------------------------|
| <b>– IDA Viewer</b>        | <b>LKSOFT</b>                      |
| <b>– Knowledge Manager</b> | <b>Knowledge Systems Solutions</b> |

# **Format for STEP Shipbuilding Implementation Forums**

- **Proposed Format**
  - **Session to compare results of tests and resolve issues with translators**
  - **Will be held either immediately preceding or following Systems Technology Panel Meeting or other Event**
  - **Results will be reported as to percent of successful transfers, which test problems caused difficulties, etc.**
    - **Problems will not be assigned to particular systems or vendors**
- **Remote Participation**
  - **One can participate in the exchange and validation process without attending the meetings**
  - **Any participant exchanging files and results will be kept abreast of developments and considered to be a full participant in the STEP Shipbuilding Implementation Forums**

# Website Under T 23

- <http://www.nsrp.org/t23>
- **EXPRESS schema (with corrections)**
- **HTML version of schema**
- **Implementers agreements**
- **Issues log**
- **Test cases**
  - **Document describing test case (annotated drawings and/or drawing numbers)**
  - **Reference STEP file**
  - **Vendor STEP files (after end of round, with vendor release)**
  - **Reference JPEG and VRML graphics**
  - **Vendor JPEG and VRML graphics (after end of the round, with vendor release)**
- **Link to TWR website**

# Distribution

- **Email distribution**
  - **Members exploder list restricted to active members of the Forum**
  - **General messages sent to T 23 and Systems Technology Panel lists**
- **File distribution**
  - **Via ISE Tools website and email**
- **Publicity**
  - **Web page**
    - **Links from Panel page on NSRP Web site and ISO TC184/SC4/WG3/T 23 Web site**
  - **Occasional messages to SC 4 community**

# Validating Files

- **Files will be run through validation checker before distribution to participants**
  - **Files must conform to schema and satisfy all WHERE rules except as noted in implementers agreement**
- **Recommended versions of tools – post on website**
- **Potential tools for checking**
  - **ST-Developer: STEP Tools, EB, Intergraph**
  - **EDM: EPM, NGSS, LSC**
  - **EXPRESSO: CTC**
  - **ECCO: LSC**

# Meetings and Participation

- **Non-US organizations are welcome to participate**
- **Meetings**
  - **Working session**
    - **Before or after Systems Technology Panel Meetings**
    - **Active members can attend**
    - **Translator software developers are encouraged to attend**
    - **Attendees are encouraged to bring a development system**
      - **Demonstrate and fix problems on the spot**
  - **Report results at Systems Technology Panel and T 23 Meetings**

# APs

- **ISO 10303, *Industrial automation systems and integration — Product data representation and exchange***

| Designation        | Title   | E<br>d | Document<br>available |
|--------------------|---|--------|-----------------------|
| ISO 10303-215:2004 | Application protocol: Ship arrangement            | 1      | 2004-05-12            |
| ISO 10303-216:2003 | Application protocol: Ship moulded forms          | 1      | 2003-07-17            |
| ISO 10303-218:2004 | Application protocol: Ship structures             | 1      | 2004-11-25            |
| ISO 10303-227:2005 | Application protocol: Plant spatial configuration | 2      | 2005-10-11            |
| ISO 10303-233:—    | Systems engineering data representation           | 1      | 2010                  |
| ISO 10303-239:2005 | Application protocol: Product life cycle support  | 1      | 2005-10-03            |

# APs and Formats

- **Guidelines:**
  - **Only one AP be tested initially**
  - **When all major issues are successfully resolved, we will expand to test other APs**
  - **No formal schedule for expansion**
    - Additional AP testing will be done by consensus among participants
- **AP Options:**
  - **Past Testing: AP 215, AP 216, AP 218**
  - **Current Testing: AP 214**
  - **Future Alternatives: AP 203, AP 209, AP 210, AP 212, AP 239, AP 227 ed 2 (HVAC, cableways, mechanical), AP 233, AP 239**
- **Format Options:**
  - **Selected Format: Part 21, ARM-XML**

# **Evaluation of AP 216**

## **Preprocessors**

- **STEP files generated must be run through validation software**
  - **EPM software**
  - **ST-Developer software**
- **Files will then be provided to all participants to run through their postprocessors**

# **Evaluation of AP 216**

## **Postprocessors**

- **Criteria should check validity of part in receiving system**
- **Typical checks include:**
  - **Y values at various X, Z locations along moulded forms for hull**
  - **Surface area of selected moulded forms**
    - especially for curved surfaces like hull
  - **Volume of hull closed by main deck or selected compartments**

# **Current Status of AP 216 Models**

- **Questions have recently arisen about accuracy of TWR models on various systems**
  - **Are we modeling a “knuckle” in the main deck?**
  - **Are current models in LEAPS, ISDP, and FORAN consistent?**
  - **To validate exchange, models do not have to be consistent with drawings or with as-built conditions, they only need to be consistent among the various systems being used in this Testing Forum**

# **Status of AP 216 Exchanges**

- **Intergraph Hull on ISDP was transferred to Intelliship via AP 216**
  - **Results at all points were within .001 Millimeter**
- **Intergraph Hull from ISDP was transferred into LEAPS via AP 216 and then sent back from LEAPS to Intergraph via AP 216**
  - **Awaiting report on accuracy of this loop test**
  - **Shortly metrics will be added to LEAPS to evaluate accuracy of files imported into LEAPS**