



EDA and Export Update

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Agenda

- **Export compliance overview**
- **Developments since DAC 2003**
- **Export controls and EDA**
- **Emerging issues for 2004**
- **Resources and Q&A**



EDAC efforts
bear fruit

Export Compliance Overview

- Purpose of export controls
- What is an export?
- Multinational framework
- Controls over exports
- US Specific Issues
- Export coordination and process

Purpose of Export Regulations

- Prevent the proliferation of nuclear, biological or chemical weapons
- Control the flow of military goods and services
- Keep technology out of the hands of terrorists
- Promote individual national foreign policies

What is an Export?

- **Release of any goods, services or technology to a “foreign national”**
 - **Export can be in any format:**
 - physical transfer of materials (documents, CDs),
 - oral/visual (presentations),
 - electronically (WAN-based access to software), etc.
 - **Foreign National can be in the US at time of Export**
 - This is a so called “deemed” export; unique to US law.

Example: EU citizen attends a presentation at DAC in San Diego given by a US-based EDA company about EDA technologies → an export

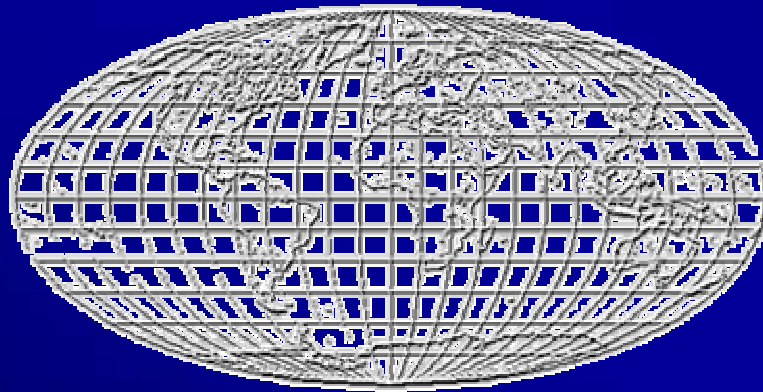
Controls Over Exports

- An item is “controlled” if there are generally restrictions on shipping an item from the US to another country based on an item’s classification
- An item that is controlled may require:
 - a license from the US government for export
 - special import documents from the receiving country, or
 - the export may simply be prohibited
- Type of control applied depends on classification, the originating country, destination country, recipient’s identity, intended end-use, etc.

Tip: The term “classification” is used to refer to the category for a specific item, e.g. Microsoft® Word has the classification EAR99.

Multinational Framework

Wassenaar Arrangement on Export Controls for Conventional Arms and Dual Use Goods and Technology



Multinational Framework (cont.)

- Global framework:

- Common list of categories describing items of concern
- Each signatory has individual discretion, can regulate export of items in each category from their country
- US law requires “further assurances”: recipient must insure that further exports follow US law

Signatories

- Argentina
- Australia
- Austria
- Belgium
- Bulgaria
- Canada
- Czech Republic
- Denmark
- Finland
- France
- Germany
- Greece
- Hungary
- Ireland
- Italy
- Japan
- Luxembourg
- Netherlands
- New Zealand
- Norway
- Poland
- Portugal
- Republic of Korea
- Romania
- Russian Federation
- Slovakia
- Spain
- Sweden
- Switzerland
- Turkey
- Ukraine
- United Kingdom
- United States

US Specific Issues

- **Additional non-Wassenaar categories (for anti-terrorism reasons)**
- **Embargoed countries**
 - **Cuba, Libya[†], Iran, Iraq[†], N. Korea, Sudan, Syria**
- **Denied parties**
- **Further assurance requirement**
- **Additional encryption restrictions**
- **“Deemed” export – showing the information to a foreigner visiting the US**

[†] Changes likely or coming for these countries

Export Coordination and Process



- May need two export licenses, e.g. if you are in Germany, then you may need permission from both Germany and the US
- Keep in mind that an export includes a foreign national accessing the software, e.g. if the software has been lawfully exported to Germany and you invite a Chinese national to use the software, you may need a US export license

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2001-2003 Export Problems for EDA

- Treaty changes were made to the key category for EDA tools (3.D.3) without industry input
- Adoption of changes in US in 2001 caused significant problems in certain areas:
 - TCAD
 - OPC
 - DRC
 - Some SPICE tools
- The problem: the 2001 version of 3.D.3 did not distinguish clearly between physics vs. model based software tools

EDAC Responds

- **EDAC tries unilateral efforts with the US government to get clarification, but:**
 - **Customers and vendors could receive unequal treatment for similar products, e.g. Company A's DRC uncontrolled, Company B's DRC controlled, etc.**
- **By mid-2001, a two year effort to get international clarification adopted was underway the goals:**
 - **Level the playing field for EDA vendors and customers**
 - **Work with governments to clearly identify, and only control, the technologies of concern: physics based simulation of lithographic processes**

Key Milestones in 3.D.3 Clarification Process

1/2001 – New 3.D.3, some EDA software re-controlled by Wassenaar

Mid-Late 2001 –

EDAC works with US government to change 3.D.3

US government decides not to take EDAC proposal to Wassenaar negotiations

EDAC's efforts result in a US government advisory opinion on January 2, 2002

Mid-Late 2002 –

Confusion reigns, similar products from different companies receive divergent classifications.

EDAC works to get a new proposal for 3.D.3 before US government before Dec 2002 deadline

Jan –March 2003 –

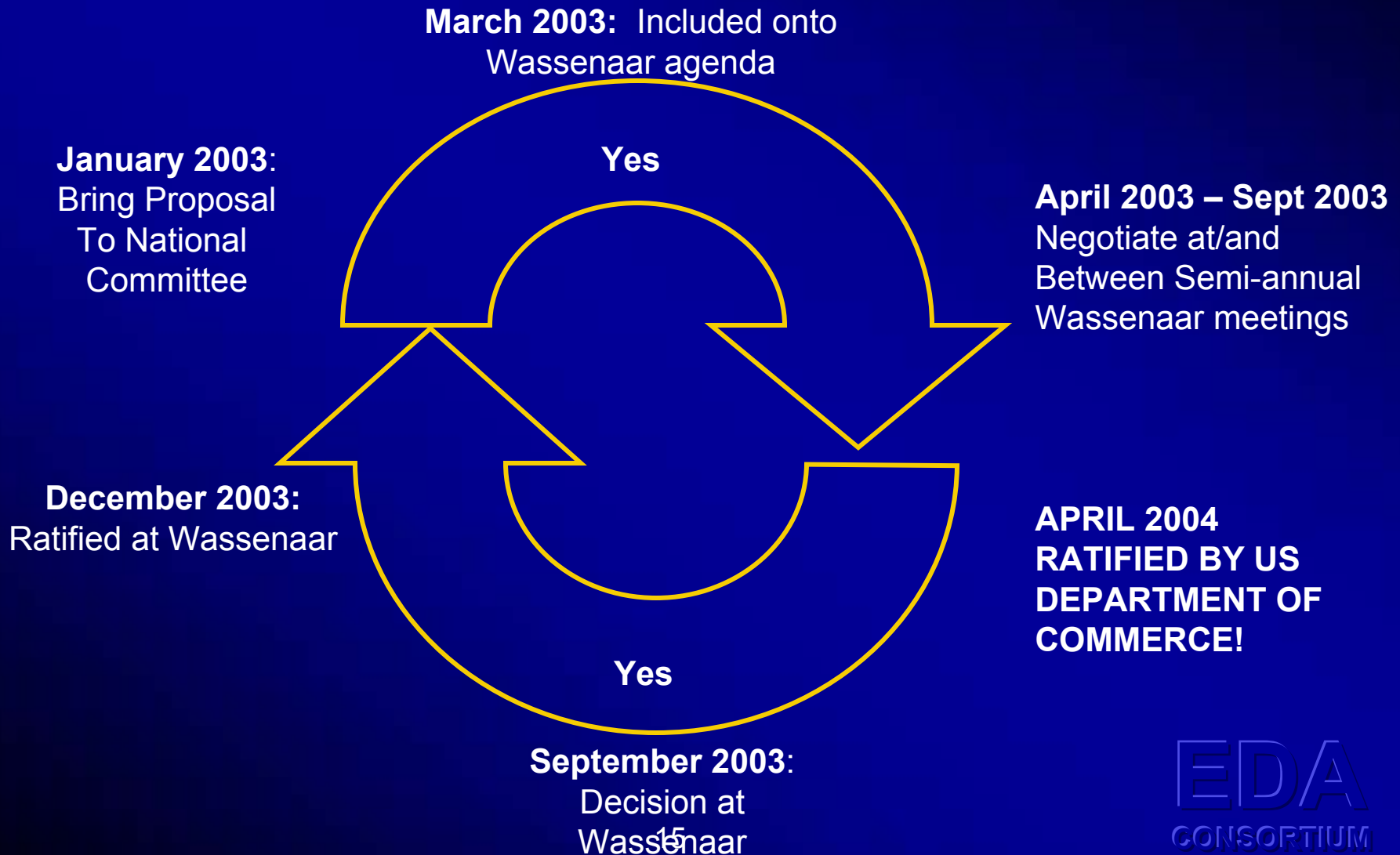
EDAC proposal shared with Commerce, Defense and State departments, proposal refined and advances to US advisory committee, forwarded to treaty negotiation at Wassenaar.

April –December 2003 – Two rounds of formal negotiations at Wassenaar plus side lobbying and instruction ends in approval and ratification at Wassenaar Plenary session in December.

2004 – Implementation of 2003 Wassenaar changes in member states is ongoing.

Ratified April 29, 2004 in USA!

Timeline to a change...



New 3.D.3 Treaty Language

3.D.3. ‘Physics-based’ simulation “software” specially designed for the “development” of lithographic, etching or deposition processes for translating masking patterns into specific topographical patterns in conductors, dielectrics or semiconductor materials.

Technical Note: ‘Physics-based’ in 3.D.3. means using computations to determine a sequence of physical cause and effect events based on physical properties (e.g., temperature, pressure, diffusion constants and semiconductor materials properties).

Note 1. Libraries, design attributes or associated data for the design of semiconductor devices or integrated circuits are considered as “technology”.

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Export Control view of EDA/IC

Front End

Product
Idea

EDA
Software

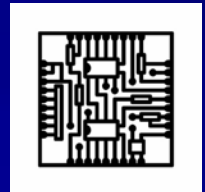
Tape
Out

Back End

Lithographic
Simulator for
Process
Development

Fabrication
Equipment

Packaging
Assembly



Equipment
Control
Software

Classifications:

EAR99

3D991 EAR99

3.D.3

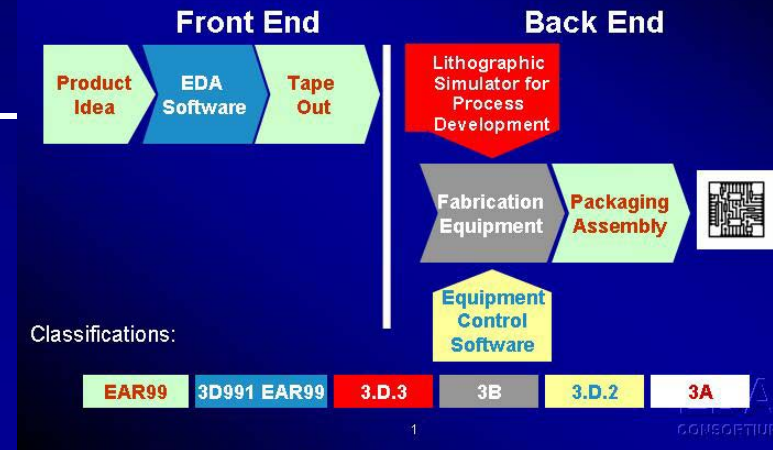
3B

3.D.2

3A

EDA Classification

- EAR99 / 3D991 (US specific anti-terrorism categories)
- Most EDA software (see next slide for examples)
- Software still must be export screened (denied parties, embargoed countries, end-use, etc.)
- 3.D.3 (US 3D003)
 - Software for physics based lithographic simulation
 - May cover certain physics based TCAD tools
 - Does not include model based OPC, SPICE, etc.



“Uncontrolled” Types of EDA Software

- Architecture design
- Logic design and synthesis
- Formal verification
- Emulation/simulation
- Physical implementation tools
- Physical Verification (DRC, LRC, LVS)
- Geometry Manipulation (OPC, RET, etc.)
- Mask Data Preparation
- Non-physics based TCAD products
- Plus:
 - Design rules
 - Circuit verification rules
 - Other “model based” simulators

CAUTION: Software still must be export screened (denied parties, embargoed countries, end-use, etc.)

Possibly “Controlled” Items

- Designs and silicon IP created with EDA tools
 - Category determined based on technology and intended use
 - Export restrictions depend on category and country of development
- Anything *specially modified* for use in military applications or for use by military end-users

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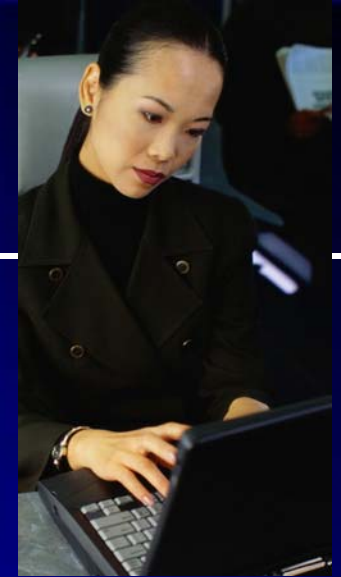
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Emerging Issues for 2004

- WAN-based licensing
- Encryption

Reminder: Designs and silicon IP created by users are subject to export control.

WAN-Based Licensing



- International WAN access = Exporting!
- Access by a country's citizens = exporting to that country!
 - Regardless of where the software resides
 - Regardless of where the person physically sits



Encryption

- **EDA software frequently incorporates encryption to help protect customer IP data**
 - **US government has additional export restrictions on encryption technology**
 - **Software classified for encryption purposes have use and import restrictions in other countries**
 - **Example: France, Russia, Israel, China (PRC), more.**

CAUTION: It is every exporter's responsibility to comply with the regulations.

Encryption (cont.)

- EDAC partnering on export aspects of encryption issues to assist customers
- EDAC export group is currently investigating the feasibility of proposing regulatory exemptions on IP-Protection software.
 - If successful, IP-Protection schemes that do not decrypt into meaningful clear-text messages would not be controlled for export purposes.

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Resources

- EDAC:
 - http://www.edac.org/resources_export.jsp
- Wassenaar Arrangement:
 - <http://www.wassenaar.org>
- Bureau of Industry and Security (US export regulator)
 - <http://www.bis.doc.gov>
- Vendor internet sites
 - Many EDA vendors post their product's export classifications on the internet

Your Questions?

