



# **U.S. Industry Interests in ITER**

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## **What has been to role of industry to date?**

While role to date has been substantial, with few exceptions, role has been limited to supply of materials, components and systems for various research reactors including for the ITER R&D program during the EDA

## **What is condition of the U.S Fusion Industry?**

Lack of opportunities has resulted in the larger corporations losing interest. Smaller, specialty corporations dropped out, were consolidated, or liquidated

# Fusion Development Worldwide

## National focus on

- developing alternate concepts
- exploring different physics regimes for improved operations and less costly reactors

## International focus on

ITER

## Industry must support both paths

National program support on same lines as the past.

ITER Role can be both the same and substantially different

# Industry (U.S. in particular) Objectives

## ◆ Shareholder Value

- Equity Appreciation and Profits.

## ◆ Value Metrics

- Business Base (Business Fit).
- Business Growth into New Markets (e.g., Spin-offs).
- New Skill Acquisition.
- Business Image.

## ◆ Fusion Energy Science Offers

- Science.
- Engineering.
- Technology.
- Applications.

# Fit of Industry Objectives and Fusion Energy Science

	Science	Engineering	Technology	Applications
Business Base		X	X	
Business Growth		X	X	X
New Skill Acquisition	X	X	X	
Business Image	X		X	X

# Industry Interest in ITER is Unique in Fusion Energy Science

- ◆ **It is a Fusion Science and a Fusion Energy Project**
  - It will be the first major fusion project in over 20 years.
  - It will absolutely require major Industry participation.
- ◆ **As an Energy Project, it will:**
  - Enhance virtually all Industry Business Value Metrics.
  - Be professionally relevant to Industry (Engineering) staff.
  - Appeal to society in general and those who provide the funds in particular.

# Industry Support of U.S ITER Contribution

- **Services, materials, components for “in-kind” contributions**
- **R&D to support materials and components**
- **Services to support the U.S share of**
  - **final design**
  - **licensing**
  - **construction**
  - **start-up**
  - **operations**

# Industry Support of U.S ITER Office

- **Contracting mechanisms to readily accomplish support**
  - Individual competitive procurements are:
    - Time consuming, and costly
    - Inefficient when scope is not clearly defined
  - Other procurements run into conflict of interest issues
- **U.S. ITER Office places individual contracts**
  - multiple competitive procurements for clearly identifiable “single purpose” tasks
- **U.S. ITER Office places general services contract(s) with Industry group**
  - seconded personnel
  - multiple purpose, design support tasks



## **Industry Views on *International* ITER Organization and Procurement Approaches.**

- **What is “Best Value” for the U.S. from the US Industry Perspective.**
- **Potential impacts of Licensing and Regulatory requirements on U.S. Industry contributions**
- **How can Industry best support the Negotiations in the context of the “likely” International ITER Organization?**
- **What improvements, if any, does U.S. Industry advise for the ITER Project Organization and Procurement approaches?**

# What is “Value?”

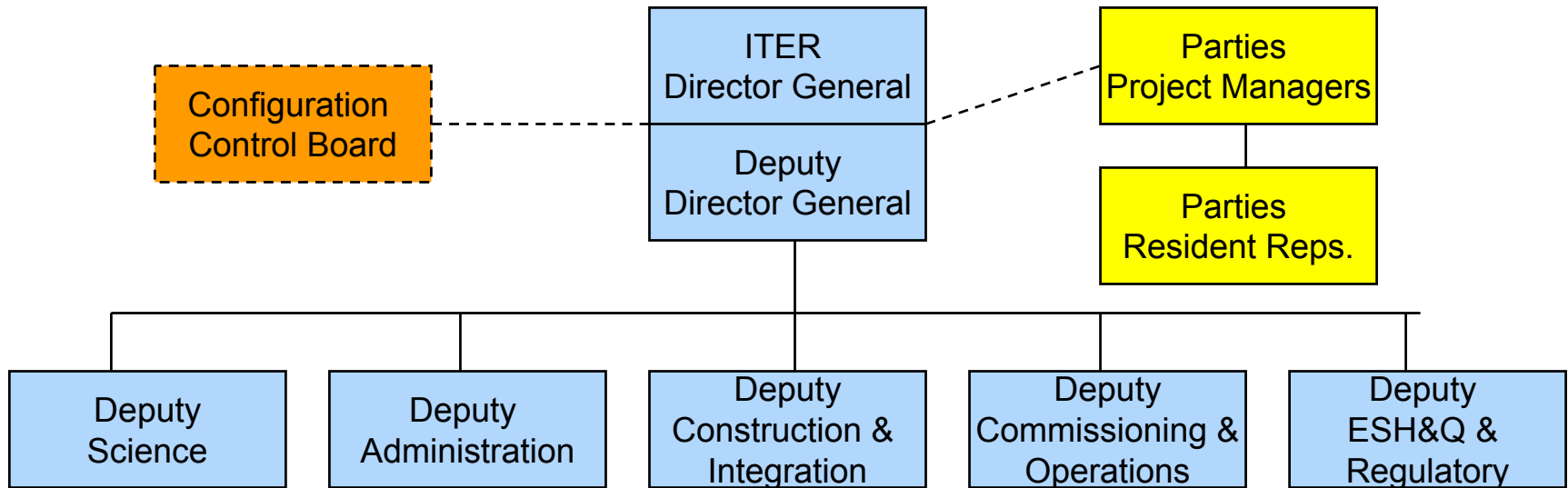
## ◆ Obvious Metrics:

- **U.S. Cost = Full scope of R&D + Design + Fabrication + Installation + Check-out/Startup + Contingency.**
- **Credit = kIUA’s assigned (or negotiated) by ITER.**
- **“Best” is Cost = Credit.**

## ◆ Not Obvious:

- **Research participation may have linkage to type of contribution (not level) to construction activity.**
- **Extent to which activity increases industrial capability in fusion and related technologies.**
- **Extent to which activity builds a U.S. fusion technology work force.**

# Possible Management Structure



First decide on optimum organization to run project, then determine best way in which the Parties can interface and support the project.

# ITER Management Choices - **Issues**

- ◆ **International nature, in-kind contributions, etc. makes management more complicated**
- ◆ **Project Execution Plan**
  - Planning procurement, fabrication, inspection, delivery, assembly of various components into systems, integration with construction of facilities, start-up and testing
- ◆ **Procurement**
  - Purchasing, expediting, vendor inspection, logistics, receipt inspection and warehousing
  - PM leverage is absent because most contracts are with Parties
- ◆ **Construction**
  - Changes during construction
  - Interaction of contractors affected by changes
  - Funding Implications

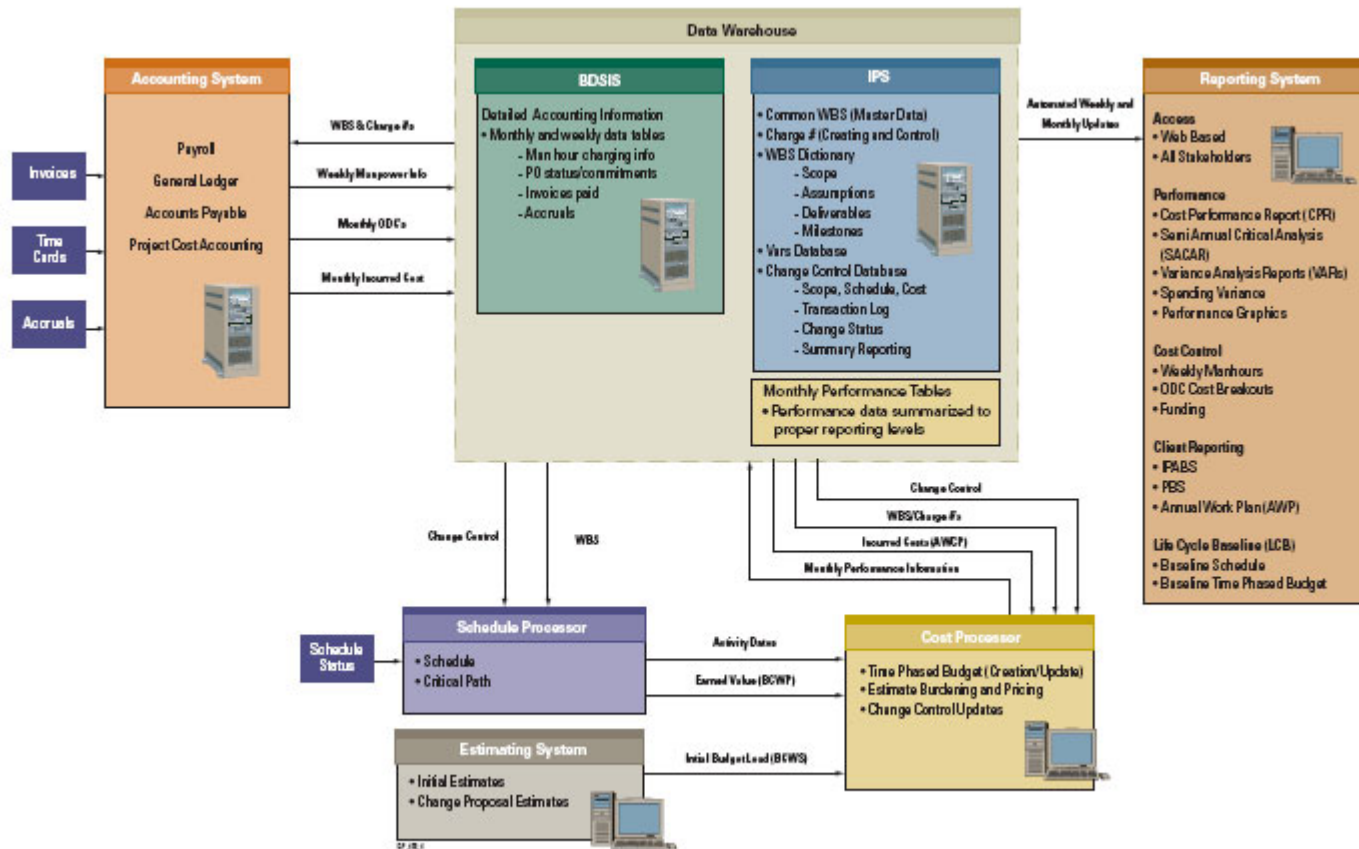
*How should ITER use industry in solving these problems?*

# ITER Choices

- ◆ **Build capability within ITER**
  - Very difficult. Major companies took decades to build capability
  - Very costly since it would be built from scratch
- ◆ **Choose an experienced A/E Systems Integrator**
  - Competitive tender likely not satisfying to Parties
  - Doubtful capability to evaluate bids and select Contractor
- ◆ **Request individual Parties industries to help with RFP**
  - Avoid conflict of interest - “all” Parties and industries involved
  - Advertise that RFP will contain clauses requiring “international” contractor
- ◆ **Choose an industry “international” consortium**
  - Industry would form such a consortium
  - Some industrial firm could show that they are “international”

*U.S. Industry could take lead in forming such international consortium?*

# Typical Project Management System



# U.S. Industry Must be More Involved

- ◆ In 1994, the DOE's Fusion Energy Advisory Committee (FEAC) had 7 of its 15 members from Industry. Today the DOE Fusion Energy Sciences Advisory Committee (FESAC) has 2 of its 17 from Industry.
- ◆ From 1994 to 1998 there was an industry-organized independent Fusion Industrial Council, U.S. (FICUS) with members from 17 industries. **We are re-formed it**
- ◆ Until the U. S. withdrew from ITER, there was an ITER Industry Council (IIC), set up and managed by the U.S. ITER Home Team. **Now there is a U.S. ITER Office**

**U.S. Industry now should decide how to increase involvement in ITER/Fusion activities.**

# Industry Support of U.S. ITER

- Suggestion of the most “effective project organization”
- Development of industrial estimates?
- Development of management plans?
- Development of procurement plans?
- Development of risk mitigation plans?
- Liaison with Industries of other Parties?
- Keep out of the way?
- Other?



# Translating Interest into Involvement

- ◆ **Form a confederation of U.S. companies to:**
  - Respond to U.S. ITER Office requests,
  - Offer specific and timely Industrial expertise to the U.S. and to the ITER Organization, and
  - Advise the U.S. Government on demonstrated industrial methods to achieve ITER project objectives.
  
- ◆ **Actively support the ITER in U.S. Government agencies.**
  
- ◆ **Achieve these goals while avoiding Conflict of Interest.**