U.S. Department of Energy
ISM Champions Workshop

September 15, 2010

James O. Ellis, Jr.
President and Chief Executive Officer
Institute of Nuclear Power Operations
Nuclear Power ... in the U.S.

104 commercial operating reactors

Generate 806 billion kilowatt-hours annually – 20% of total electricity generated

Highest levels of performance
Nuclear Power ... Globally

439 commercial operating reactors

61 reactors under construction

Generate nearly 2,600 terawatt-hours annually – 14% of total electricity generated

Generally high levels of performance
“There are two possible outcomes: If the result confirms the hypothesis, then you've made a measurement. If the result is contrary to the hypothesis, then you've made a discovery.”

- Enrico Fermi
Bandwagon Market

• 237 nuclear plants ordered from 1965-1978
Challenges of Early Success

- Growth
- 54 integrated utilities
- Overestimating the market
- Underestimating the risks
- Plants cancelled
- Billions lost
- Trust eroded
President’s Commission on the Accident at Three Mile Island

- Set and police standards of excellence
- Systematic gathering and analysis of operating experience
- Accredited training
- Operator training and plant simulators
Mission

To promote the highest levels of safety and reliability – to promote excellence – in the operation of commercial nuclear power plants.
Our Core Work

- Evaluations
- Analysis and Information Exchange
- Assistance
- Training and Accreditation
Operating Experience
Reporting of events ...

- Nuclear, public and personnel safety
- Generation capability
- Plant construction or modification
- Generic implications
- Beneficial lessons learned
- Classified emergencies
- Other requirements
1979

2010

- Safety
- Performance
Effective Self-Regulation

- CEO engagement
- Nuclear safety focus
- Industry support

- Accountability
- Independence
INPO Today

- 342 employees
- 64 on-loan employees
- 11 employees on reverse loan
- $99.7 million – 2010 budget
• 26 U.S. members – companies with 104 commercial operating reactors
• 20 international participants
• 23 supplier participants
INPO Members

26 companies – 104 reactors
INPO Supplier Participants

AREVA
Fluor
Williams
USEC
URS
Bechtel
GE
ENERCON
Honeywell
Day & Zimmerman
Sargent & Lundy
Westinghouse
Kiewit
B&W
Scientech
Louisiana Energy Services
Shaw
Black & Veatch
WSI
Toshiba
Hitachi
Mitsubishi
Nuclear Fuel Services
INPO International Participants

New Brunswick Power
Canada
Chalk River Labs
Canada

Hydro-Quebec
Canada
Electrabel
Belgium
Eskom
South Africa
Eletronuclear
Brazil
Comision Federal De Elect
Mexico

British Power
United Kingdom
Electricite de France
France
UNESA
Spain
Nuclearelectrica
Romania
Slovenske Elektrarne
Slovak Republic

KHNP
Korea
JANTI
Japan
Taiwan Power
Taiwan
Ontario Power Generation
Canada
Nuklearna Elekt. Krsko
Slovenia

Bruce Power
Canada
ENECE
United Arab Emirates

20 members
DOE Interaction

• Assist visits to DOE sites
  • 4 per year
• Operating experience
  • 40 DOE sites with INPO member site access
• Attendance at INPO workshops, CEO Conference
  • 40-to-70 people per year
U.S. Industry Performance

- Best ever... global leader
- Leadership, human talent, plant equipment, problem recognition and correction
Global Performance

- Generally high levels of performance
- Similar improvement trend – though not quite as high
• Security challenges after 9/11
• Significant capital projects
• Ownership changes
• Davis-Besse response
2010

- Performance improvement
- Complacency
“In times of change the learners inherit the Earth, while the learned find themselves beautifully equipped to deal with a world that no longer exists.”

Eric Hoffer
U.S. philosopher
and author
Pathways to New Missions...
Shaping the future

- Industry Performance
- Accountability
- Nuclear Workforce
- Worldwide Safety
The clean-energy gap to continued global growth and prosperity
Closing the clean-energy gap to continued global growth and prosperity...

- OECD Countries: 314 in 2006, 341 in 2030 (9% growth)
- Non-OECD Countries: 42 in 2006, 71 in 2030 (69% growth)
- China, India, and the rest of the world: 20 in 2006, 97 in 2030 (385% growth)

Closing the clean-energy gap to continued global growth and prosperity...

- OECD Countries: 314 in 2006, 341 in 2030 (9% growth)
- Non-OECD Countries: 42 in 2006, 71 in 2030 (69% growth)
- China, India, and the rest of the world: 20 in 2006, 97 in 2030 (385% growth)
Vision

Setting the global standard in nuclear safety. We demand EXCELLENCE of ourselves and expect it of others.
Energy generates prosperity
And it makes quite a difference
Energy generates prosperity
Per Capita Electricity Consumption (kilowatt-hours per year)

<table>
<thead>
<tr>
<th>Region</th>
<th>Per Capita Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFRICA</td>
<td>578</td>
</tr>
<tr>
<td>ASIA</td>
<td>705</td>
</tr>
<tr>
<td>LATIN AMERICA</td>
<td>1838</td>
</tr>
<tr>
<td>CHINA</td>
<td>2346</td>
</tr>
<tr>
<td>MIDDLE EAST</td>
<td>3252</td>
</tr>
<tr>
<td>NON-OECD EUROPE</td>
<td>3302</td>
</tr>
<tr>
<td>FORMER SOVIET UNION</td>
<td>4608</td>
</tr>
<tr>
<td>OECD</td>
<td>8477</td>
</tr>
</tbody>
</table>
### Poverty Eradication

<table>
<thead>
<tr>
<th>Country Type</th>
<th>World’s Population</th>
<th>Average Per Capita Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed countries</td>
<td>15%</td>
<td>&gt; $40,000</td>
</tr>
<tr>
<td>Developing countries</td>
<td>85%</td>
<td>&lt; $2,000</td>
</tr>
</tbody>
</table>
Prosperity Shared Broadly

Development Transition

Upward Convergence of Living Standards

Gains from development reach all countries

1 percent increase in per capita income requires a 0.5% increase in electric generating capacity
Ensuring Global Nuclear Safety

- Industry performance – organizational accountability
- Diversity – regulatory approaches and standards vary
- Workforce opportunities
- New entrants – emerging nuclear countries
Promoting Global Nuclear Safety

- National Regulators
- Owners and Operators
- Nuclear Advocates
- National Industry Organizations
- IAEA
- National Governments
- WNA
- Nuclear Technical Societies
- Builders and Vendors
- Environmental Groups
Global Nuclear Safety
...a coalition of the willing
Between the mission and the vision,
Between the present and the future,
Between the reality and the dream,
There is one important word: **HOW**
It’s all a question of how.

And it’s the HOW that makes all the difference.