

Nuclear Energy 2002: Solid Value... Significant Upside

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NUCLEAR
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Today's Themes

Nuclear industry status

- **2001 plant performance**
- **Industry initiatives to increase asset value**

Safety-related issues

- **Current safety performance**
- **Nuclear plant security**

Policy and politics

Nuclear Industry Status

- 2001 plant performance
- Industry initiatives to increase asset value



Record Nuclear Electricity Production Is Sustainable



* Nuclear Energy Institute estimate





Industry Average Capacity Factor Reaches Another All-Time High





Economic Performance: Steady Improvement Continues

(3-year rolling average production costs in cents per kilowatt-hour)

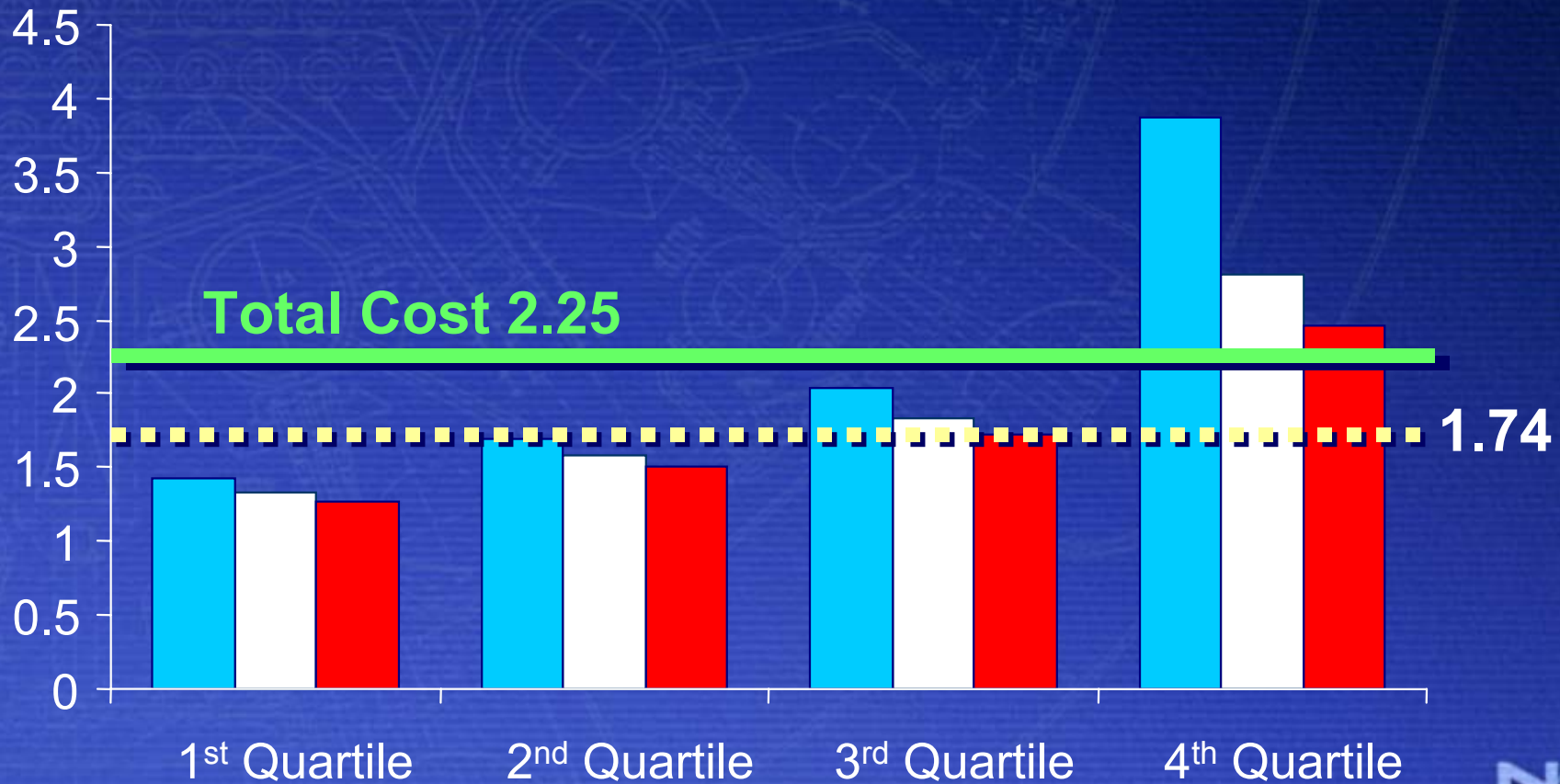


Source: Utility Data Institute and company reports to Electric Utility Cost Group (EUCG)



Economic Performance: Steady Improvement Continues

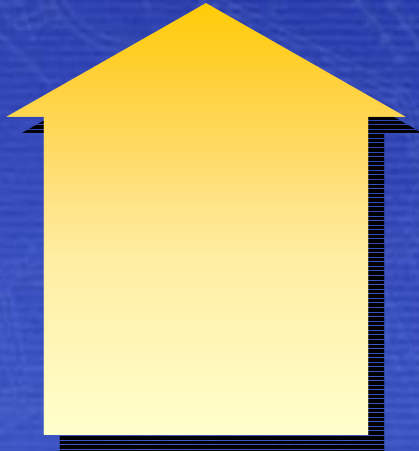
(3-year rolling average production costs in cents per kilowatt-hour)



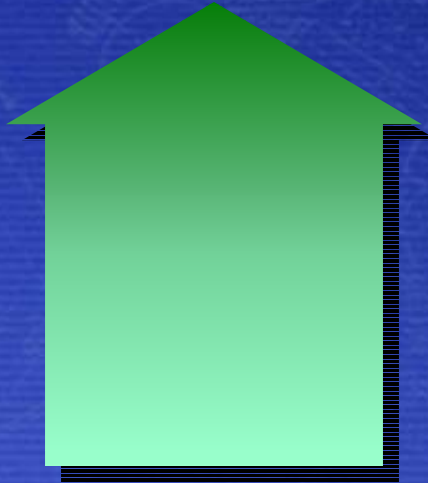


Beyond Competitive Electricity: Value Added From Nuclear Energy

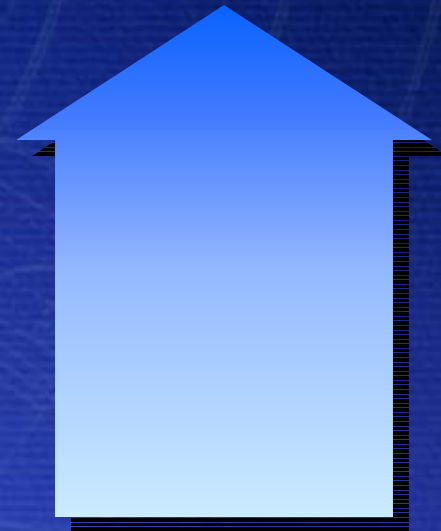
Competitive
Electricity



Forward
Price
Stability



Clean Air
Compliance
Value

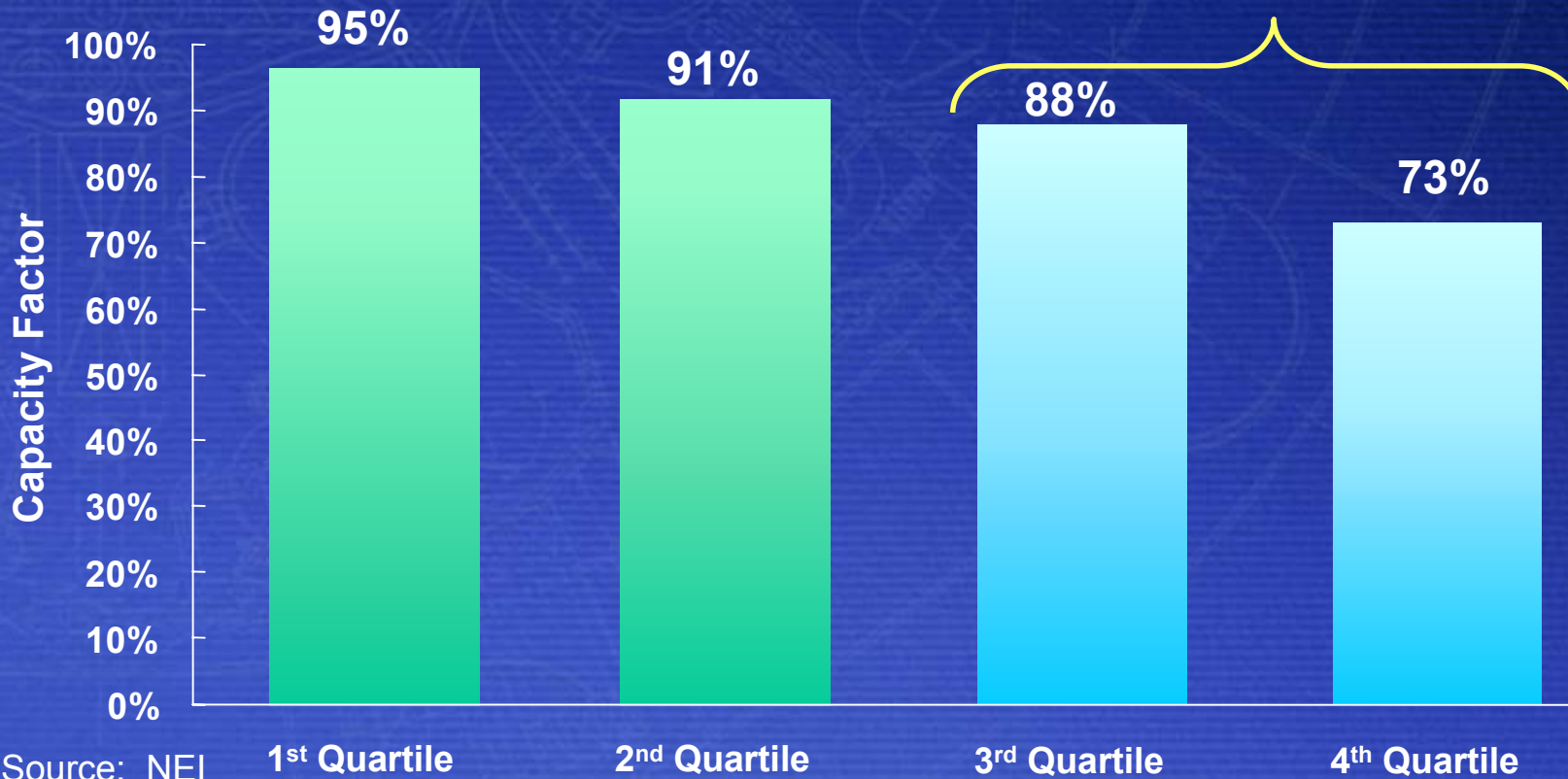




U.S. Nuclear Plant Performance: Unlocking Additional Value

(Industry average capacity factor 3-year 1998-2000 rolling average)

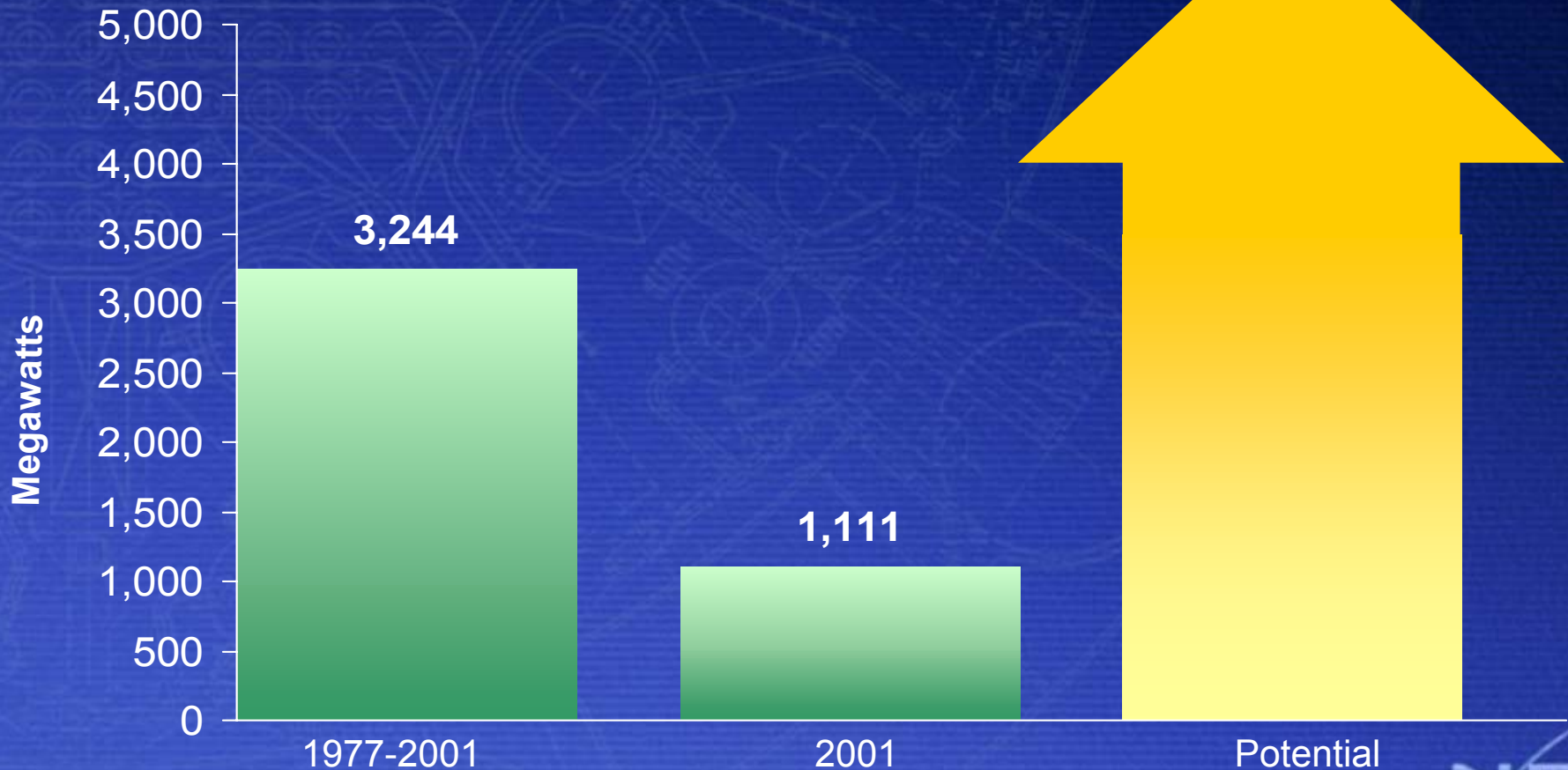
Opportunity to increase output
in 3rd and 4th quartile plants



Source: NEI



U.S. Nuclear Plant Upgrades: Unlocking Additional Value





Unlocking Additional Value: Improved Management Techniques

- **Major change management initiative underway in U.S. nuclear industry**
- **Moving from functional-based business organizations to process-centered organizations**
- **Industry organizations have developed Standard Nuclear Performance Model:**
 - **Improve productivity**
 - **Lower O&M costs**
 - **Better performance measures**



Unlocking Additional Value: Strategic Sourcing Example

	Before: Functional Approach	After: Process Approach
Suppliers	2,763	39
Invoices	136,011	26,352
Purchase orders	9,733	196
Inventory	\$ 39 million	\$ 24 million



Unlocking Additional Value: Supply Chain Management Example

Functional Business Organization	Process-Centered Business Organization
3 managers, 12 supervisors, many “leads”	1 process owner, 5 process teams, 1 coach
100 people	44 people (doing more work)



Increasing Asset Value

Electricity sales price

– Cost to produce

x Kilowatt hours produced

Margin

Cost down 5% & Output up 5% = Margin up 36%

Cost down 10% & Output up 10% = Margin up 76%



License Renewal: Unlocking Additional Value



Already filed

Turkey Point 3,4
North Anna 1,2
Surry 1,2
Catawba 1,2
McGuire 1,2
Peach Bottom 2,3
St. Lucie 1,2

Approved

Calvert Cliffs 1,2
Oconee 1,2,3
Arkansas Nuclear
One Unit 1
Hatch 1,2

Announced

2002
Summer
Fort Calhoun
Robinson 2
Ginna

2003

Arkansas Nuclear
One Unit 2
Browns Ferry 2,3
Farley 1,2
Dresden 2,3
Quad Cities 1,2
Cook 1,2

2004

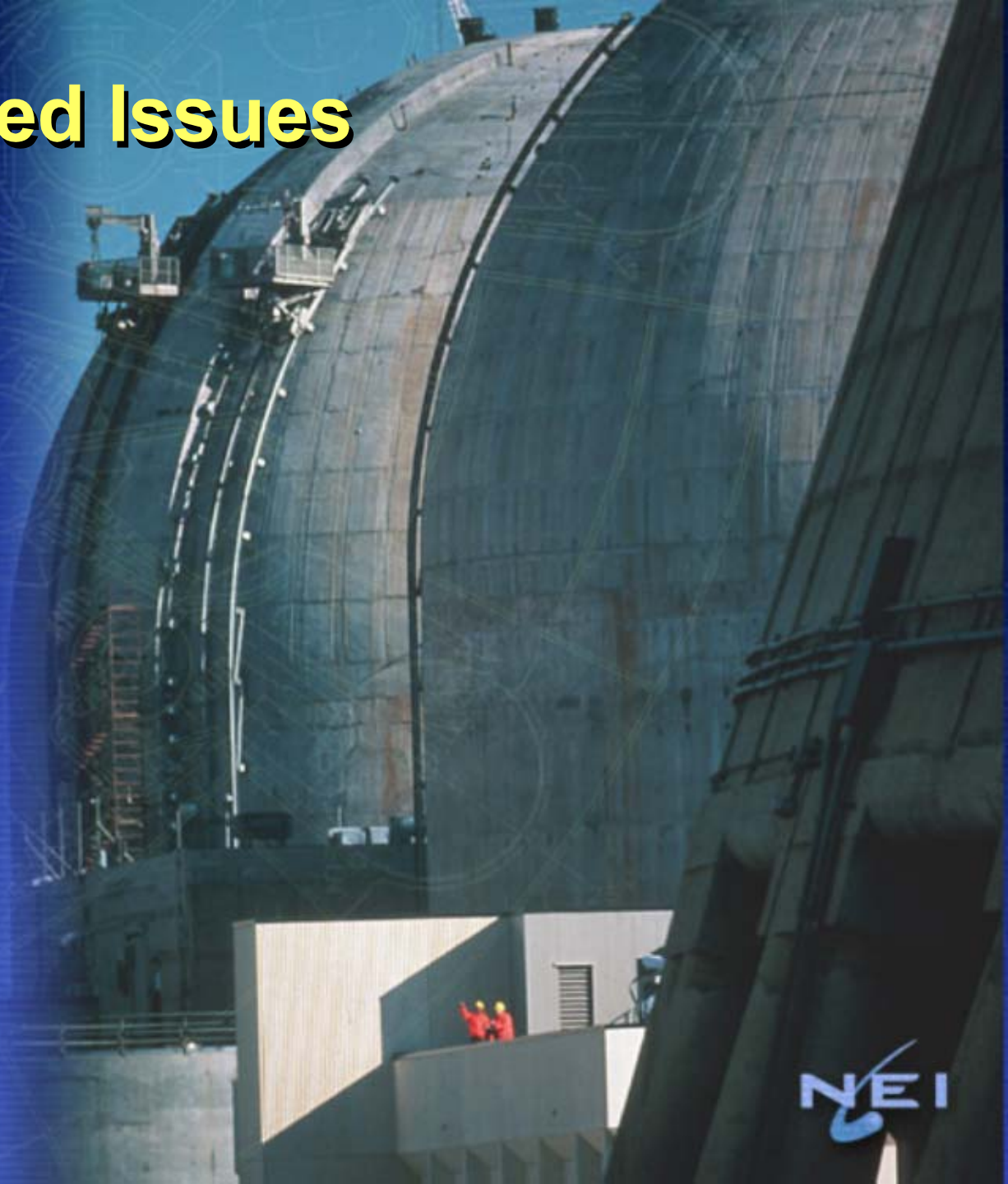
Brunswick 1, 2
Beaver Valley 1,2
Pilgrim
Davis-Besse

2005

Cooper
Susquehanna 1,2

Safety-Related Issues

- **Current safety performance**
- **Nuclear plant security**





Measuring Safety Performance

- **NRC's reactor oversight process includes:**
 - **18 quantitative performance indicators**
 - **Inspection program and enforcement program geared to safety-significance of findings**
 - **Performance indicators dictate level of regulatory oversight, beyond "baseline" inspection program**



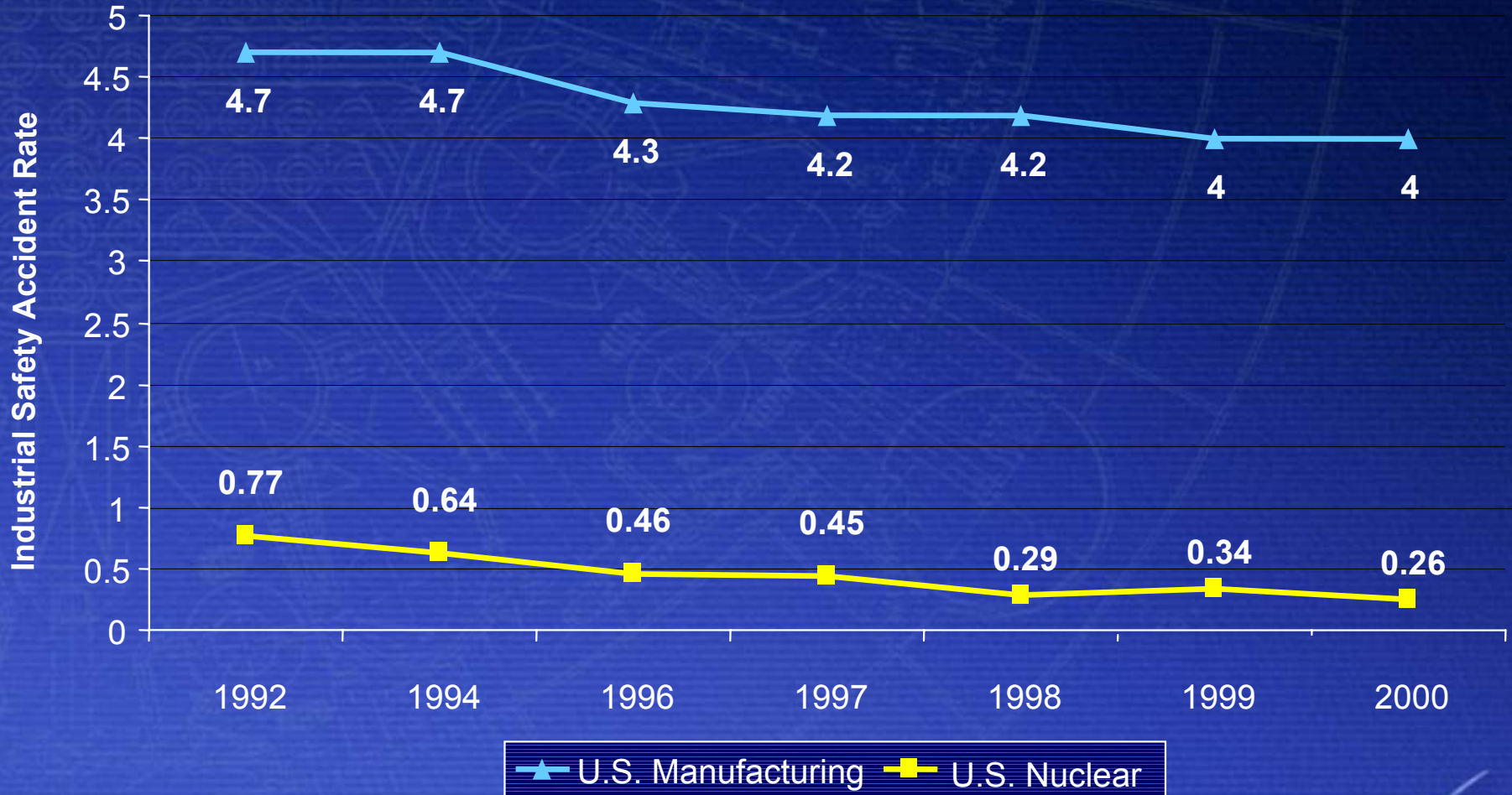
U.S. Nuclear Plant Performance: Sustained High Levels of Safety

Reactor Oversight Process: Key Results		
1st Quarter 2001	2nd Quarter 2001	3rd Quarter 2001
92 units all "green"	93 units all "green"	95 units all "green"
9 units with one "white"	10 units with one "white"	8 units one "white"
1 unit with two "whites"		
1 unit with three "whites"		





Exceptional Levels of Safety at U.S. Nuclear Power Plants





Nuclear Plant Security: The Basics

- **NRC requirements, industry programs protect public from possible exposure to radioactive release caused by sabotage**
- **All plants have comprehensive measures for security and safety**
 - **Robust containment**
 - **Redundant, diverse plant safety systems**
 - **Trained plant staff, skilled in accident and event response**
 - **Comprehensive emergency plans**
 - **Rigorous security plans and security forces**
- **Regulated in all phases of operation**



Multiple Layers of Protection in a Robust Physical Structure



Containment
Vessel

1.5-inch thick steel
Shield Building Wall
3 foot thick reinforced concrete

Dry Well Wall
5 foot thick reinforced concrete

Bio Shield
4 foot thick leaded concrete with
1.5-inch thick steel lining inside and out

Reactor Vessel
4 to 8 inches thick steel

Reactor Fuel

Weir Wall
1.5 foot thick concrete

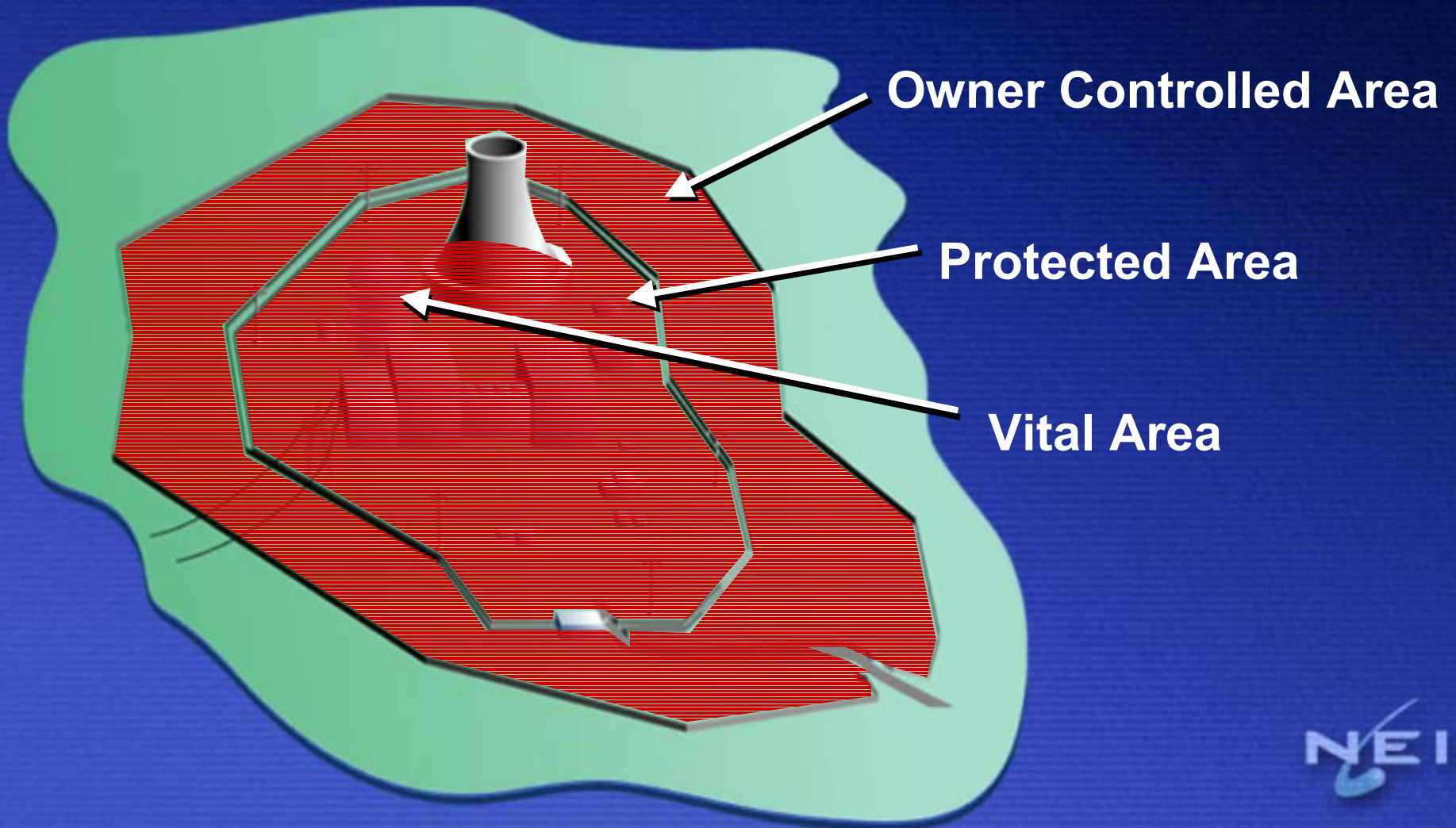


F4 Crash Test





Plant Security: Three Control Areas, Progressively Tighter Security





Protected Area Barriers

- Double fence
- Intrusion detection system
- Closed circuit TV and pan/tilt zoom cameras
- Isolation zone
- Yard lighting
- System monitoring performed by redundant alarm station monitoring





Access to Protected Area: Vehicle Barriers

- Steel cables
- Jersey and concrete barriers
- Natural terrain





Access to Protected Area: Personnel Barriers

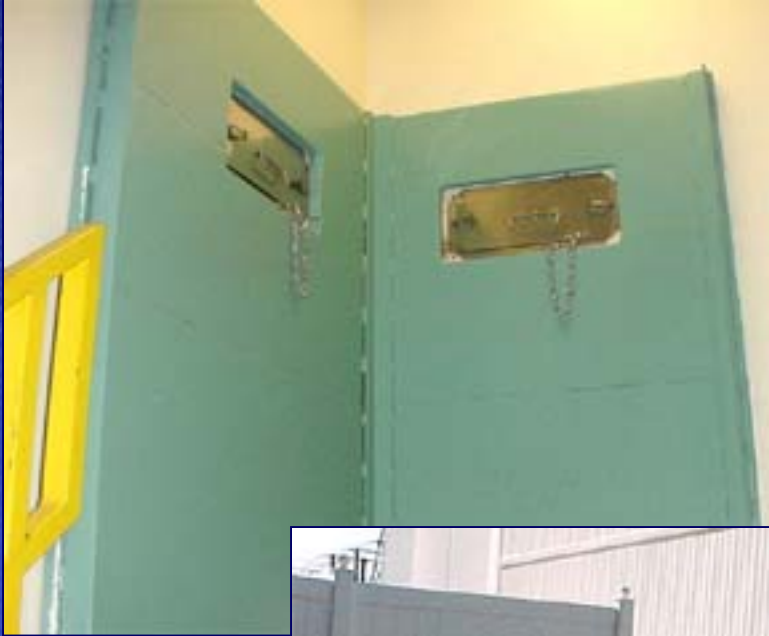
- Access control systems
- Personnel and material searches



Access Delay Barriers



Protective Strategy





Nuclear Plant Security Forces

- **Nationally – 5,000 trained officers**
 - On average 80 per plant site
- **65% have previous security experience**
- **93% retention**
- **Highly trained paramilitary force**
 - 270 hours of initial training
 - 90 hours/year of re-qualification
 - 30 hours/year of “anti-terrorist” tactical exercises

Nuclear Plant Security: An Untold Story



Nuclear Power Plant Security—

Steve Yancey
Nuclear Plant Security Officer

It What Takes

Meet Steve Yancey— Desert Storm Veteran, Marine Infantry Platoon Sergeant before his still recent and military education, US Army Special Forces. The security of America's nuclear power plants begins with the highly committed, highly trained, well-compensated professionals who protect them. Steve

Meet Steve Yancey—
formerly of the 82nd Airborne and the U.S. Marine Corps

Yancey has what it takes. Like Yancey, 70% of the security professionals who protect America's nuclear power plants have your

education, law enforcement or industrial security experience. They are subject to FBI background checks, coordination training, substance

abuse testing, stress management courses, and physical fitness testing. Their training is intense, ongoing, and continuous. They are expert marksmen, usually certified in an array of weapons. In short, they're professionals! What it takes to protect America's nuclear power plants may surprise you.



Nuclear Power Plant Security—

Duane Sims, Nuclear Plant Security Officer

Serious Business

Meet Duane Sims— 10 years as a nuclear security officer, Degree in Criminal Justice, Certified firearms instructor. The security of America's nuclear power plants begins with the highly committed, highly trained, well-compensated professionals who protect them. Duane Sims has what it takes.

Meet Duane Sims—
Degree in Criminal Justice and Certified firearms instructor.

70% of the security professionals who protect America's nuclear power plants have your military law enforcement, or industrial

security experience. They are subject to FBI background checks, psychological screening, substance abuse testing,

stress management courses, and physical fitness testing. Their training is intense, ongoing, and continuous. They are expert marksmen, usually certified in an array of weapons. In short, they're professionals! Nuclear power plant security—it's serious business.



Nuclear Power Plant Security—

More Than Strong Fences

The other individuals are actual nuclear power plant security officers.

The security of America's nuclear power plants begins with the highly committed, highly trained, well-compensated professionals who protect them. 70% of these professionals have your military law enforcement, or industrial security experience.

It's about the paramilitary security professionals who protect what's behind the fences.

They are subject to FBI background checks, psychological screening,

substance abuse testing, stress management courses, and physical

fitness testing. Their training is intense, ongoing, and continuous. They are expert marksmen, usually certified in an array of weapons. In short, they're professionals! Nuclear power plant security—it's about more than strong fences.





Industry Response to 9/11: Immediate Actions

- **All nuclear plants to highest alert level**
 - **Increased patrols**
 - **Augmented security forces and capabilities**
 - **Heightened coordination with law enforcement and military authorities**
 - **Limitations on access to plant sites**

- **NRC top-to-bottom review of safeguards and security requirements and policies**
 - **Regulations governing commercial nuclear facilities**
 - **NRC coordination with other agencies, communications capabilities, etc.**



Industry Response to 9/11: Strategic Recommendations

- **Perform comprehensive review of all credible threats to security of critical energy infrastructure, including nuclear power plants**
- **Determine which possible threats should be the responsibility of**
 - **federal government (terrorist acts of war)**
 - **private industry**



Appropriate Strategic Response: A Seamless Defensive Shield





Policy and Politics

- **Strong support from Bush administration, solid bipartisan support in Congress**
 - **Unequivocal support in Bush administration energy policy**
 - **Nuclear provisions in all major pieces of energy policy legislation introduced**



Used Fuel Management: Critical Decisions in 2002

- **The first step:** On January 10, Energy Secretary notified Nevada Governor of intent to recommend Yucca Mountain site to President
- **Decision based on rigorous scientific assessment**
- **Next Steps:**
 - President's decision
 - Congressional action
 - License application





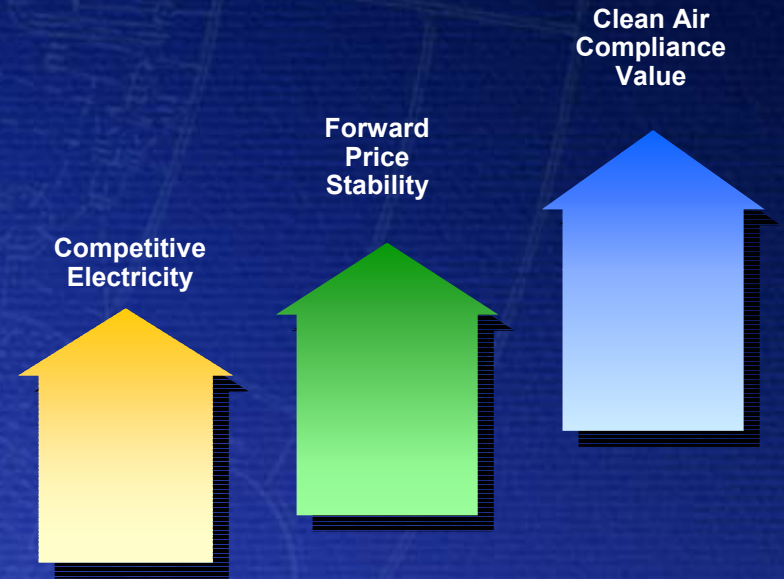
New Nuclear Power Plants: Status of Industry Initiatives

- **Industry conducting multi-year program to:**
 - **Validate new licensing process (early site permits, single license to build and operate, etc.)**
 - **Reduce capital costs**
 - **Develop innovative designs (e.g., smaller, modular gas-cooled reactors)**
- **Industry goal: Ensure nuclear generating technology options are available when needed**



The Prospects for Nuclear Energy

- **Future business climate**
 - significant price/supply volatility
 - upward cost pressure on fossil generation due to clean air requirements
- **Business climate reinforces value of nuclear plants**
 - hedge against fossil fuel price/supply fluctuations
 - responsive to escalating environmental requirements
- **Business conditions justify planning for new nuclear plant construction**



Nuclear Energy 2002: Solid Value... Significant Upside

The logo for the Nuclear Energy Institute (NEI) features the letters "NEI" in a bold, white, sans-serif font. A stylized, teal-colored swoosh or checkmark-like element is positioned below the "E" and extends to the right, ending under the "I".

NEI

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ENERGY
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