

**COMMISSION BRIEFING SLIDES/EXHIBITS**

**BRIEFING ON DECOMMISSION FUNDING**

**FEBRUARY 23, 2010**



# **Exelon Decommissioning Funding Assurance**

**Adam H. Levin  
Exelon Generation Company, LLC**

**NRC Commissioners' Briefing  
February 23, 2010**

## **Decommissioning Funding Assurance**

- In its biennial submission, Exelon did not meet NRC's Minimum Funding requirements of 10 CFR 50.75 for some of its nuclear units
  - NRC estimated shortfall - \$1,142M for eight units
  - Exelon estimated shortfall - \$184M for six units
- Exelon's remediation plan described actions to resolve shortfall
  - Project plan timeline
  - Updated site-specific SAFSTOR decommissioning cost estimates
  - Financial guarantee for any remaining underfunded position

## **Exelon Insights**

- Attempting to close the funding gap in a short timeframe (less than project timeline) would be detrimental to funding efficiency
- Taking actions with fund assets to attempt recovery
  - Create distortions in investment strategy by shifting assets
  - Invitation to poor fund investment behavior
  - Generate taxes on unrealized gains – eroding fund long term
- Obtaining a Letter of Credit in an illiquid market – very costly, if available
- Parent guarantee
  - Though a viable option, the obligation to maintain six times tangible assets may impact corporate credit ratings

## **Conclusions**

- Given the long-term liability, allow time for markets to sort themselves out
- Update decommissioning cost estimates for those units which appeared to be underfunded
- Develop and execute a cogent plan to provide financial assurance within two years of recognized shortfall



***Entergy Views on  
Decommissioning Funding Assurance  
Commission Briefing  
February 23, 2010***

**Donna Jacobs**

Senior VP, Planning, Development & Oversight  
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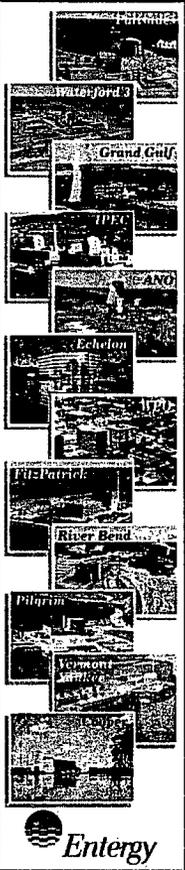
# *Decommissioning Funding Assurance*

- Decommissioning funding assurance is a long term process
- Entergy funds have recovered or are recovering
- Current requirements provide adequate assurance for power reactors
- Changes to regulatory guidance are not needed



# *Decommissioning Funding Assurance*

- Time period to address short-falls should not be arbitrarily shortened
- Requiring a “future value” for parent guarantees is an unnecessary expense that provides no value to any stakeholders



# NUCLEAR DECOMMISSIONING

NEW YORK STATE PERSPECTIVE

Presented by John Stewart

February 23, 2010

# New York State Concerns

- Disclaimer
- Timing
- Funding
- RIS 2001-07

# Timing

- NRC established 40 year license life.
- NYS requires new generation of any type to provide for the retirement and site restoration.
- Nuclear decommissioning funds collected from ratepayers for all funding needs upon license expiration. Amounts periodically updated.
- Changes Early 2000s: Divestiture, life/license extension, competitive generation markets.

# Funding

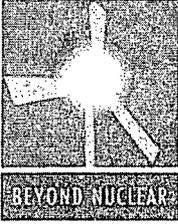
- Sale of nuclear plants appeared predicated on uprates, license extensions and SAFESTOR.
- Funding transferred at time of sale was for DECOM and site restoration.
- SAFESTOR is employed as vehicle for assuring sufficient funds are available for decommissioning and site restoration.

# RIS 2001-07

- The NRC is on the right track asking for information regarding commingling of funds.
- In NY we recognized at time of sale that:
  - Funds could very well be comingled,
  - SAFESTOR likely employed to assure sufficient funding for radiological and non-radiological decommissioning, and
  - Buyers must commit to site restoration at time of sale.

# RIS 2001-07

- The Concern: Owners justify funding sufficiency for radiological decommissioning using full amount of available funds while also having committed some of those funds for site restoration.
- Voluntary request for information may be problematic.
- NRC and NYS PSC: Legal responsibilities different but interests are similar.
- Operators could as part of their bi-annual reporting show how they will meet radiological and any non-radiological responsibilities they may have given the funding levels and appropriate assumptions about the future, including the use of SAFESTOR.



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**Before the United States Nuclear Regulatory Commission  
Statement of Paul Gunter, Reactor Oversight Project, Beyond Nuclear**

**“Leak First, Fix Later” Impacts on Decommissioning Fund Shortfalls  
February 23, 2010**

Mr. Chairman, Commissioners, thank you for this opportunity to address the Commission on the issue of decommissioning funding.

Peter Shumlin, President Pro Tem of the Vermont State Senate recently made some relevant remarks to this briefing in an announcement that the State legislature will vote this week on whether or not to allow Entergy's Vermont Yankee to operate beyond its current 40-year license which terminates on March 12, 2012.

He is quoted to say “Vermont Yankee has been further marred by Entergy's attempt to create a debt ridden spin off corporation to take ownership of the plant. The cleanup fund is already more than half a billion dollars short and Vermonters cannot afford a corporation that may shift that cost to ratepayers.”

Monthly decommissioning funding disclosures to the State of Vermont made Vermont Yankee the nuclear industry's bellwether for the steep decline industry-wide in decommissioning funds. This practice should be required of each nuclear power plant and provided to State and Federal regulators. Vermont Yankee may now become the bellwether for an industry also misrepresenting facts significantly affecting accurate estimates for “minimum” decommissioning funds,

namely the presence and condition of an uninspected miles-long tangle of corroding buried pipes that run under every nuclear site in this country carrying radioactive effluent amidst protected groundwater resources.

Senator Shumlin's remarks exemplify an emerging public mistrust exacerbated by an operator's false statements made under oath to State officials with regard to tritium leaks into groundwater and underground radioactive contamination that has now moved offsite at least as far as the Connecticut River. In fact, the public confidence and trust is more broadly eroded in industry's commitment to decommissioning with each additional uncontrolled and unmonitored radioactive release at a still growing number of reactor sites in the US.

As we know, tritium is a tracker isotope for a larger host of slower moving radionuclides that can escape through these same uncontrolled and unmonitored radioactive effluent release paths.

I am reminded of an early Yankee Atomic Corporation promotion that I saw for the decommissioning of the Yankee Rowe nuclear power plant in Western Massachusetts. It was an artist's rendition of the decommissioning of Yankee Rowe featuring "before" and "after" pictures. The "before" image pictured the small 167 megawatt reactor sitting on the banks of the Deerfield River. The "after" rendition had air-brushed out the atomic power plant's image leaving a now bucolic countryside picture. However, the artist had mistakenly left the reactor's reflection in the river. Yankee Atomic Corporation eventually corrected the graphic mistake. But I believe this little story and Senator Shumlin's remarks are poignant for our dialogue today. They point to the increasing uncertainty and mistrust with regard to nuclear power industry's accountability for the protection of natural resources and the adequacy of funding for decommissioning operations in light of uncontrolled and unmonitored radioactive leaks. Uncontrolled and unmonitored leaks significantly escalate the unreliability of "minimum" decommissioning cost estimates and therefore the availability of

maintained funds for cleanup of the sites and protected resources that flow beyond company property lines.

Two examples illustrate this concern.

The decommissioning costs for the Yankee Rowe atomic power plant escalated from an initial estimate of \$120 million to \$750 million dollars---in large part the result of the spread of ground water contamination, some readings of elevated tritium in the aquifer system as deep as 300 feet. Because of the company's inadequate decommissioning funds, true to Senator Shumlin's concern for Vermonters, the bulk of the cost was passed onto Yankee Atomic ratepayers.

Connecticut Yankee had set aside \$410 million in its fund for a decommissioning that ultimately tallied up to a cost of \$1.2 billion due in no small part to strontium-90 contamination travelling along with a radioactive tritium plume into the surrounding water table. The extent of the contamination was only discovered well after the decommissioning process began. Again, the decommissioning fund shortfall and mitigation cost overrun was passed onto Connecticut ratepayers.

Uncontrolled radioactive releases have raised the issue of how current methods for establishing meaningful "minimum" decommissioning cost target estimates are fundamentally flawed and misleading with a formulaic one-size fits all approach that does not take into account the potential for significant---even catastrophic---groundwater contamination from uncontrolled and unmonitored radioactive leaks.

This formulaic and generic flaw raises the public concern that a reactor's parent company or its subsidiary Limited Liability Corporation could someday declare bankruptcy and leave extensive and costly cleanup operations of contaminated soil and water as well as the indefinite or permanent on-site storage of irradiated nuclear fuel to a State and its ratepayers. As Senator Shumlin further pointed out

the establishment of shell corporations are recognized as financial liability fire walls for parent corporations and foster further public concern for the adequacy of environmental protection supposedly afforded through current decommissioning funding mechanisms.

Furthermore, inadequate funding compounded by the added and uncertain cost from extensive soil and water contamination can in of itself cause a delay in the completion of an environmental cleanup for decades leaving long-lived radioactive toxins to infiltrate deeper and contaminate underground aquifers as well as surface water rivers and lakes in proximity and downstream of the site.

The issue before the Commission regards how these gaps in decommissioning funds will be closed to protect public health and safety and maintain environmental quality. However, the one element missing from the equation is how the costs from these recurring uncontrolled and unmonitored radioactive releases around the country are to be captured and incorporated in the impact on already significant financial gaps and shortfalls in decommissioning funds.

Beyond Nuclear concurs with Senator Shumlin, as well as Fairwinds Associates in Burlington, Vermont and other public interest advocates that these untallied costs should not be the financial burden of the ratepayers and of the States. Having significantly profited from plant operations, the parent companies should be more tightly regulated and held accountable to absorb these costs as part of the thorough completion of decommissioning and site clean-up operations.

In fact, uncontrolled and unmonitored releases from reactor effluent discharge pathways are in violation of 10 CFR 50 Appendix A General Design Criterion 60 Control of Radioactive Effluent Pathways and Design Criterion 64 Monitoring of Radioactive Effluent Pathways. Given that uncontrolled radioactive releases are in evidence as significantly increasing decommissioning costs and widening an already significant gap in decommissioning fund shortfalls, we contend that

stronger regulatory action is warranted. In our view, it is reasonable for the Nuclear Regulatory Commission to take enforcement action against violators of their license conditions at minimum by imposing on the licensee the loss of options for decommissioning finance methods as designated in Draft Guidance-1229. The loss of design control and monitoring of radioactive effluent pathways would result in a licensee being required to establish and maintain in a prepaid segregated fund 100% of an independently assessed final decommissioning cost. Factors for making additional future adjustments in decommissioning cost estimates would include a periodic independent review and reassessment of costs associated with each disclosure of uncontrolled and unmonitored releases from a reactor's radioactive effluent pathway.

Similarly, the advent of Limited Liability Corporations (LLC) formed as the result of the growing consolidation of nuclear ownership has created the very real risk of shifting decommissioning cost shortfalls to the public from the parent corporations, whose LLC's only asset may be an individual reactor site. We contend that LLCs shall be required to similarly establish prepaid segregated decommissioning funds with 100% of an independently assessed decommissioning cost.

I thank you for your time.

# Nuclear Plant Decommissioning Cost Escalation

February 23, 2010

John Mothersole

Principle, IHS Global Insight



**GLOBAL  
INSIGHT**

The Source for Critical Information and Insight™

# Real Nuclear Cost Escalation Will Continue to be Modest

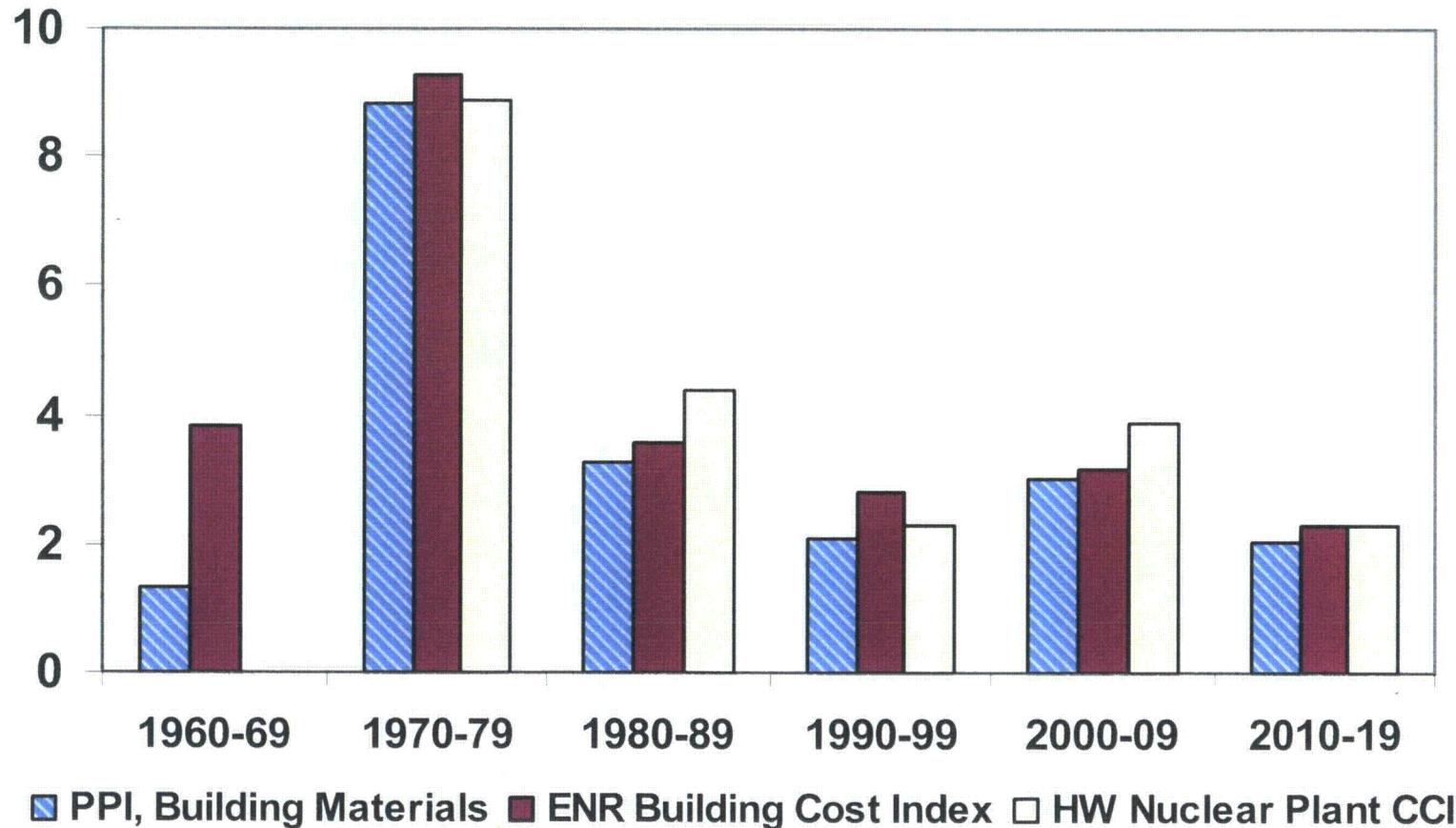
- Nuclear construction and decommissioning cost escalation does exhibit a premium over both 'normal' construction and general inflation (Chart 1)
- Estimated premium is about 1% over the next 10 years – on par with the observed premium over the past 45 years
- Commodity prices are not the source of these real increases

# Commodity Prices

- Raw material price volatility has increased since 2000 (Charts 2 and 3)
- But this volatility does not reflect growing resource scarcity (Chart 4)
- Real commodity prices have fallen over the past 100 years – and are likely to continue falling or remain flat over the next 10-20 years

# Nuclear Cost Escalation Premium

Chart 1: Compound Annual Growth Rates (Nominal)



# Volatility Has Increased Since 2000

Chart 2: Commodity Price Volatility Has Increased  
(Standard deviation in price changes across 15 commodities)

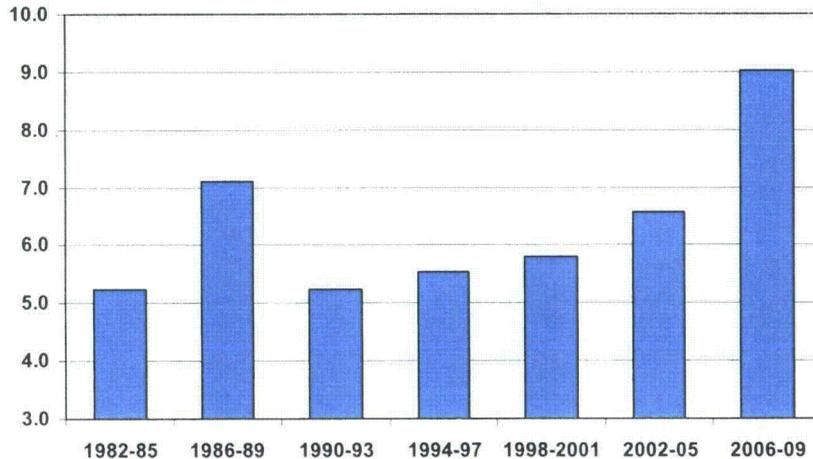
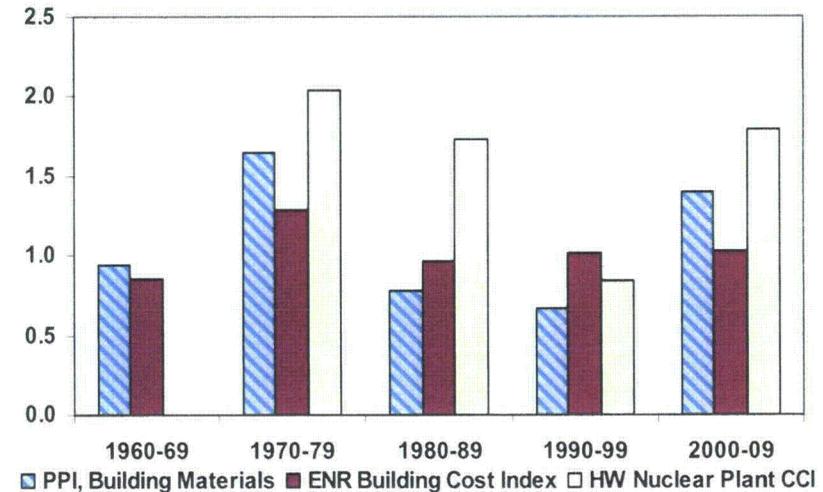


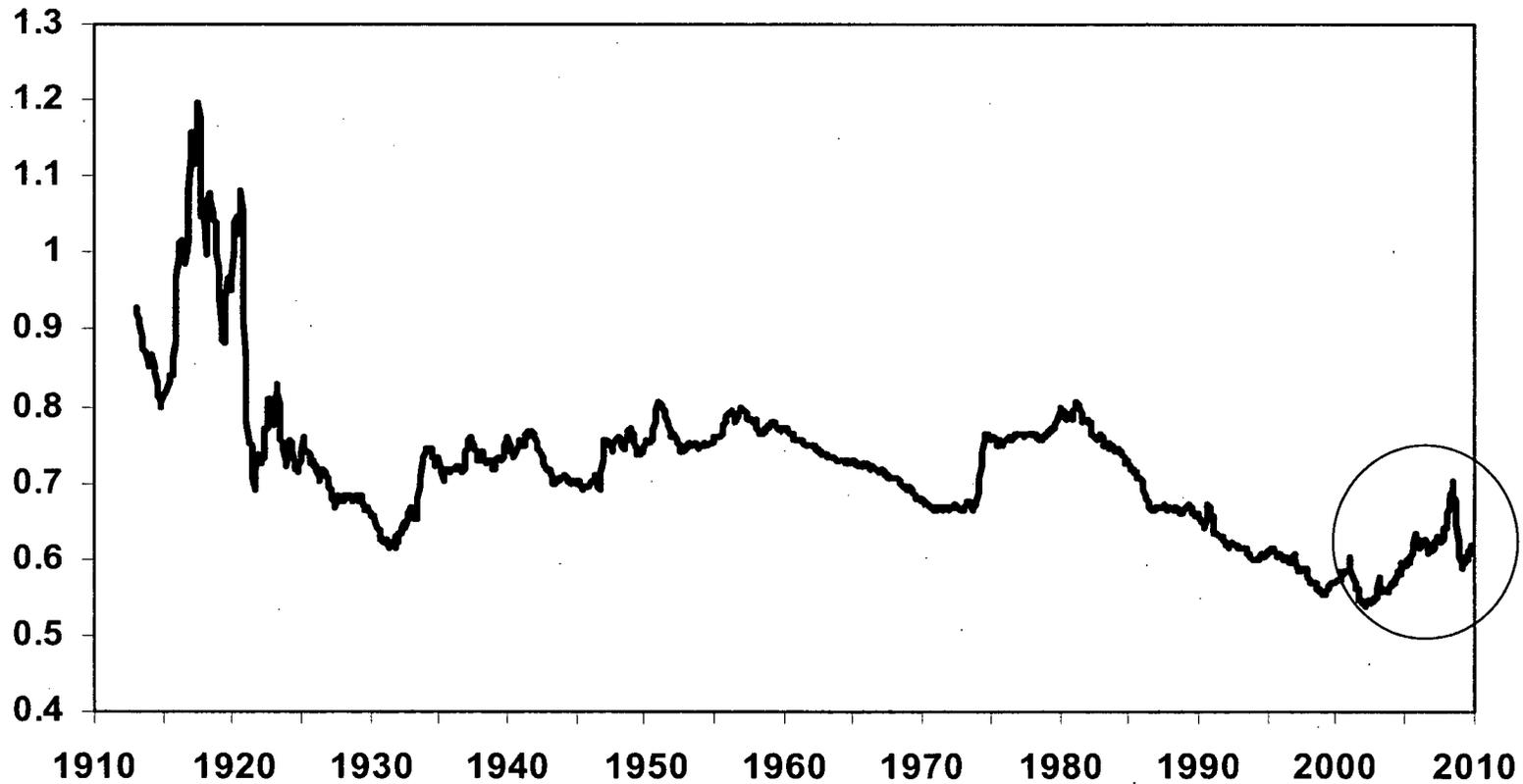
Chart 3: Standard Deviations (in percent changes)



- Heightened volatility since 2000 is a function of excess liquidity not growing resource scarcity

# The Supercycle in Perspective

Chart 4: Real Commodity Prices



— PPI Industrial Commodities Deflated by the CPI, 1920=1.000

# Notes

- Chart 1

- PPI = Producer Price Index
- ENR = Engineering-News Record
- HW Nuclear Plant CCI = Handy-Whitman Nuclear Plant Construction Cost Index(es)

- Chart 2

- Commodities include gold, silver, oil, aluminum, copper, coffee, sugar, rubber, cotton, corn, wheat, lumber, steel scrap, steel plate, hot-rolled carbon steel sheet

- Chart 4

- PPI Industrial Commodities = Producer Price index for Industrial Commodities, a broad aggregation of prices for textiles, leather, energy, chemical, plastics, metals, wood, paper, and equipment products
- CPI = Consumer Price Index



# **DECOMMISSIONING FINANCIAL ASSURANCE**

**Feb. 23, 2010**

**Eric Leeds**

**Tim McGinty**

**Thomas Fredrichs**

**Office of Nuclear Reactor Regulation**

# Overview

- **Decommissioning Financial assurance (DFA) Requirements**
  - **Status of 2008 shortfalls**
  - **Regulations**
- **Financial instruments**
- **Regulatory Guide RG 1.159**
- **Enhancing DFA**

# **DFA Requirements**

- **Status of 2008 Shortfalls**
- **77 facilities had adequate assurance**
- **21 of 27 Shortfalls Resolved**
- **6 plans under review**

# **DFA Requirements (cont'd)**

- **Regulations**

- **Accumulation (§ 50.75)**

- **Spending (§ 50.82)**

- **1988 utility-based**

- **1998 utility and merchant plants**

# **Financial Instruments**

- **Criteria for funding methods**
- **Variety of instruments § 50.75(e)**
  - **Cash accumulation**
  - **Agreement to provide cash**
  - **Commitment to seek cash**
  - **Combinations**

# **Financial Instruments, cont'd**

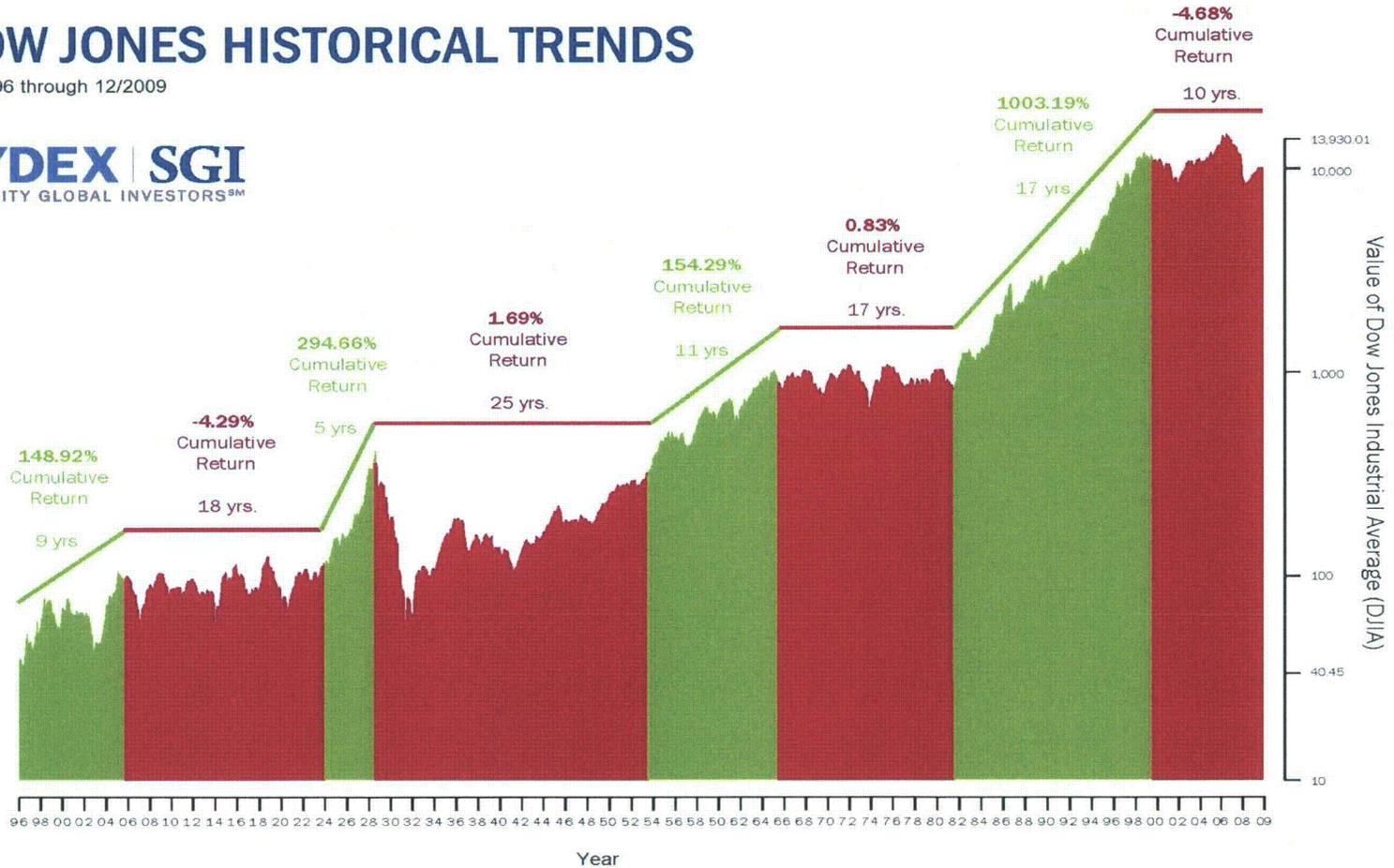
- **Potential Trends**
  - **Response to increasing fund balances**
  - **SAFSTOR to provide DFA**
  - **Greater reliance on market gains**

# Financial Instruments, cont'd

## DOW JONES HISTORICAL TRENDS

12/1896 through 12/2009

**RYDEX | SGI**  
SECURITY GLOBAL INVESTORS<sup>SM</sup>



# **DG-1229**

- **Assuring Availability of Funds**
- **Proposed changes to guidance**
- **Draft for comment**
- **Public meeting**
- **Extensive industry comments**

# Enhancing DFA

- **Shorter term**
  - **Regulations & Guidance**
  - **Minimum specified in § 50.75(c)**
- **Longer term**
  - **Work with stakeholders to clarify rules**
  - **Consider probabilistic approach to DFA**

# Closing

- **Past success**
- **Plan for future**
- **Confident that funds will be available when needed**

**SOME COMMENTS ON  
NRC's APPROACH TO  
DECOMMISSIONING  
FINANCIAL ASSURANCE FOR  
POWER REACTORS**

**February 23, 2010**

**Paul Bailey, Senior Fellow,  
ICF International**

# **Presentation Topics**

- **Roles and responsibilities for component amounts**
- **Use of parent guarantees**
- **NRC intervention (e.g., “topping off”) authority policy development**

# **Roles and Responsibilities for Decommissioning Financial Assurance – Fund Accumulation and Spending**

- **NRC – radiologic only**
- **FERC – jurisdictional only**
- **State environmental and health agencies and USEPA – primarily non-radiologic**
- **PUC – ratepayer-funded costs**

# **Roles and Responsibilities for Decommissioning Funding Assurance – Fund Accumulation and Spending (cont'd)**

- Is the division of labor and accountability transparent?**
- Are the respective dollar amounts clear to all?**
- Are radiologic and non-radiologic fundings assured through separate mechanisms or otherwise walled off?**

# Parent Guarantees

- **Experience with financial tests with solid technical bases has been excellent where reviewed, but significant concern and opposition exist**
- **Vulnerability/opposition is facilitated when some elements of the underlying financial test are or appear outdated. The staff has proposed appropriate fixes.**

# **Intervention Authority Policy Development : Key Questions**

- **Who has it? Who needs it?**
- **When (criteria) and how (process) to exercise?**
- **Coordination with other agencies?**
- **Documented rationale (technical basis) for exercise of authority is desirable**

**Questions?**

Decommissioning Financial Assurance  
Prepared by Paul E. Bailey, Senior Fellow  
ICF International  
for  
Briefing on Decommissioning Funding  
February 23, 2010

ICF International has been a task order contractor to U.S. NRC for support of various NRC financial assurance programs for over 20 years; for example, we provided technical input to the staff for the decommissioning planning rule. ICF also has worked for over 30 years on financial assurance for other Federal regulatory agencies (especially different parts of the U.S. EPA, and the Federal Motor Carrier Safety Administration); many U.S. states; agencies of the governments of Canada and Australia; and the European Commission. ICF's work has covered all aspects of financial assurance (e.g., cost estimation methods, evaluation of instruments), as well as many types of facilities ranging from hazardous waste facilities, municipal waste landfills, underground storage tanks, underground injection wells, motor carriers of people and goods, vessels, mining and mineral processing, materials licensees, fuel cycle facilities, power reactors, facilities handling CERCLA (Superfund) hazardous substances, asbestos in schools, lead paint in housing, and geosequestration of carbon dioxide. I have provided leadership for this line of work at ICF.

Among the lessons learned from this broad experience are:

Applicability and Scopes. Information about the performance of financial assurance programs is difficult to acquire, and published audits are poorly documented. Reported failings of financial assurance (FA) are most commonly due to limited applicability and scopes (coverage) of FA

rules, not to inherent regulatory flaws. In other words, public funding required to address a site results when the financial assurance rules didn't cover certain types of facilities or didn't require certain scopes (e.g., decommissioning vs. remediation) to be assured.

In addition, when FA is first imposed on a previously unregulated industry sector, some facilities will turn out to be legacy sites requiring costly case work. A financial assurance program does not turn a marginal company into a well-capitalized firm. However, financial assurance requirements can screen undercapitalized firms from entering a particular industry.

Financial assurance programs have reported occasional problems accessing funds from specific assurance instruments, notably insurance but also letters of credit and surety bonds on occasion. The reasons for difficulties accessing funds from letters of credit and surety bonds are not documented. Difficulties related to collecting from insurance reportedly arise from terms and conditions included in policies as well as insurers' management of claims.

Financial assurance has become broadly recognized as an important element of many safety and environmental programs. EPA recently announced an initiative to study whether to apply FA to certain classes of facilities associated with hazardous substances, including facilities in the electric power generation, transmission and distribution industry due to issues relating to coal combustion residuals. As EPA studies potential financial assurance regulations for coal-fired power plants, NRC's experience with financial assurance for utility and non-utility nuclear power plants may be instructive.

Comments on NRC's Decommissioning Financial Assurance. A funding assurance program's effectiveness and strength may change as the real-world context changes. It wasn't that many years ago that pundits warned of many premature NPP closures because nuclear plants would not be able to compete economically. Instead the future turned out to include competitive costs and associated license renewals for NPPs. Similarly, cleanup of on-site contamination at NPPs was not considered a material issue, until leaks were discovered at several facilities.

The staff has not tasked ICF to provide support regarding the topics being addressed today. The points I make in my presentation reflect my independent judgment as an expert on financial assurance.