

**Testimony of Robert G. Card**  
**Under Secretary of Energy Science and Environment**  
**Before the Defense Nuclear Facilities Safety Board Public Hearing**  
**November 21, 2003**

Thank you, Mr. Chairman and members of the Board for inviting me to address you today. I welcome this opportunity to tell you about the progress the Department has made in assuring safe operations while accomplishing its missions. For my part, I am proud of the record to date.

First, we need to understand the historical context underlying the actions of this Administration. The DOE of the 80's was in denial of its defense environmental responsibilities, liabilities and risks. This culminated in the FBI raid on Rocky Flats in 1989. The DOE of the 90's acknowledged the responsibilities and liabilities but didn't understand the risks and couldn't develop systems and processes for addressing them. The DNFSB was chartered in 1988 and became an effective agent for helping DOE understand risk priorities and safety systems for addressing them.

We began this administration with very specific goals. Taking our lead from the Board, especially Recommendation 94-1, we aggressively moved forward to reduce risk to the public and workers by accelerating the cleanup of the DOE sites. Some of our cleanup schedules have been accelerated by more than 30 years. This reduction of risk to the public is a personal initiative of Secretary Abraham and is fully supported in President Bush's budget. The Secretary expects no increase in risk to workers as a result of this acceleration, however. I am pleased to report that we have, in fact, seen dramatic improvements in worker safety while engaging in some of the world's most hazardous work. As an added benefit to the taxpayer, we are on track to save over \$50 billion from a baseline that was impossible to achieve. This results in more than \$1 billion per year of funding for other risk reduction efforts from 2025 to 2070.

Further, the Administration has made the tough decision to open up waste receiving sites. Yucca Mountain was selected and is marching toward a December 2004 license application, two years earlier than was estimated just two years ago. Savannah River has become a processing center and the MOX project has been fully funded. The Waste Isolation Pilot Plant continues to achieve record throughput. All low level waste repositories have remained open and on-site disposal has been on schedule. These accomplishments have safety and risk reduction benefits that far transcend DOE's in-house clean up mission.

As an example of our progress, we are working hard to accelerate all 94-1 Material Stabilization and packaging requirements by the end of 2004 with the exception of Savannah River Neptunium Solutions and oxide packaging.

This change in strategy has had much broader implications for DOE. All of our programs have become much more focused on their overall end goals. The improvements in the Waste Repository baseline will save 20% in the overall cost and more than a decade in the completion of the initial consolidation. Fossil Energy is on the front lines working to resolve the natural gas shortage, fill the Strategic Petroleum Reserve, and develop state of the art power and hydrogen from coal without CO2 emissions. The Energy Efficiency and Renewable Energy organization has developed a solid program to achieve a hydrogen vehicle commercialization decision in 2015. The Office of Nuclear Energy has focused considerable resources to building a new Generation IV nuclear reactor in Idaho, and the possibility of a new Generation III+ start appears within reach. The new Office of Electric Transmission and Distribution has begun a comprehensive review of new electricity technologies and policies, an analysis of the blackout, and ways to mitigate further incidents. The Office of Science has developed a new 20-year plan to focus on the critical questions in the physical sciences. And equally important, the Department has expanded the charter of the Office of Worker Transition to include Legacy Management, so the public lands that may remain in the control of the DOE are managed in an effective, safe and cost effective manner.

The Department's safety performance clearly shows our ability to get more work done, and do it safer. The DOE injury and illness rates have declined to a historic low in 2003. Much of this improvement is due to institutionalizing Integrated Safety Management as a way of doing business. Our workers have been empowered through formal Voluntary Protection and Behavior Based Safety Programs. Workers are actively using their stop work authority. This is a path we cannot back away from. Once workers are given the authority and accountability to protect themselves, they will not give it up willingly. Our annual measure radiation dose to workers has remained stable at well under 100 mrem, (this is 5% of the maximum allowed) although the increase in work in cleanup had the potential for a significant increase in exposures if not properly managed. There have been no Type A accident investigations since 2000, and only three Type B investigations a year since then. This is fewer than any of the previous 6 years.

These results are because of conscious efforts on the part of DOE and its contractors. We have emphasized effective work planning and accurate budgeting, made adjustments to our management oversight and policies, and better defined the roles and responsibilities of the Federal workforce and the contractors. We have made great strides in prioritizing and simplifying our requirements by reducing duplication and resolving conflicting requirements. We have a vision for excellence for all programs and sites and have moved forward in clearly defining corporate roles and responsibilities.

While we are proud of our accomplishments thus far, we have much yet to do. We must continue to make these changes, and also monitor and evaluate the effectiveness of these efforts. I hold my direct reports, the Assistant Secretaries and Office Directors, accountable for the safety, safeguards and environmental performance of the programs and sites under their purview. I hold Quarterly Executive Reviews of every site and program with the Senior Managers as a group. Many best practices and common problems have been shared at these meetings, and common solutions are discussed. I also hold quarterly meetings with the oversight organizations and others, including the Office of the Inspector General, Independent Oversight and Performance Assurance, Environment Safety and Health, Price Anderson Enforcement, and Security. I require

real time reporting of significant injuries, exposures and accidents to me, which I forward to the Secretary. I expect strong field enforcement of our requirements, and look for evidence of that behavior.

While much has improved, we have several safety concerns that require our immediate and continued attention. The accelerated pace of work generates its own challenges. The configuration of the job site constantly changes which may mean that the hazards are not always fully identified. The workforce may be only temporary for a specific job and they may not fully understand the safety requirements for work performed at a DOE site. As work is accomplished, there may be overconfidence in the ability to do that work safely. Our old facilities have many configuration questions, resulting in many electrical intrusion incidents. Lack of appropriate maintenance over many years has added to this problem. The hazards of D&D operations are often not familiar to the DOE workforce. Dealing with new production operations such as routine shipment of nuclear waste has brought with it many quality assurance issues. The utilization of the feedback and improvement step of ISM still needs work. The continued distraction of the workforce as sites downsize, missions change, and major contractors change through re-bidding of long standing contracts adds worker transition management to the mix.

DOE is making unprecedented progress in reducing risk, eliminating work and managing safety events. The DNFSB should take credit for much of the progress. In DOE, line management accountability, executive management engagement, and focusing on those objectives and requirements that are truly important have been key to this accomplishment. However, we know from commercial benchmarks that more can be done in both safety and productivity. We intend to continue to aggressively work to improve DOE performance in both of these areas. I want to extend our safety philosophy and culture beyond just event management. We need to fully understand the precursor indicators that predict safety problems and deal with them. In the end, the safest work is that which is eliminated while still achieving the same mission objective. Planning for the end of the job helps us prevent future legacy issues and undue risk to workers and the public, and is just good business.



**Department of Energy**  
**Safety Management In Energy, Science and Environment**

DNFSB Public Meeting  
Bob Card  
Under Secretary  
October 21, 2003

DNFSB Oct 03, Slide



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## Historical Context

- The DOE of the 80's (and before) was in denial of its defense environmental responsibilities, liabilities and risks
  - This culminated in the FBI raid on Rocky Flats in 1989
- The DOE of the 90's acknowledged the responsibilities and liabilities but didn't understand the risks and couldn't develop systems and processes for addressing them
- The DNFSB was chartered in 1988 and became an effective agent for helping DOE understand risk priorities and safety systems for addressing them



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**This is Not Your Father's DOE**  
**The President and Secretary Want, and Have**  
**Achieved, Game Changing Strategies**

- Stemming from the leadership of the Board with Recommendation 94-1, and continuing to the present, DOE has:
  - Achieved spectacular progress toward public and worker risk reduction
  - Plus achieving record safety results
  - While engaged in some of the world's most hazardous work
- This Administration has taken the issue of risk reduction and safety very seriously
  - Personal initiative of Secretary Abraham
  - Fully supported in President Bush's budget



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## Game Changing Strategies (Cont.)

- This Administration has made the tough decisions to open up waste receiving sites
  - Yucca Mountain was selected and DOE is marching toward a December 2004 License application, two years earlier than estimated just two years ago
  - Savannah River has become a processing center and MOX has been fully funded
  - WIPP continues to achieve record throughput
  - All LLW repositories have remained open and on site disposal has been on schedule
- This has safety and risk reduction benefits that far transcend DOE's in-house clean up mission





## Examples of Progress

- On track to reduce the cleanup date from 2070 to 2035, perhaps even as early as 2025
- The result is a dramatic improvement in time weighted risk reduction for the public and workers
- On track to reduce the budget by well over \$50 Billion from a baseline that was impossible to achieve on the old strategy
- The result is more than \$1 Billion per year of funding for other risk reduction efforts from 2025 to 2070



## EM Risk Reduction Examples

- Will complete stabilization and packaging of all Pu metal, oxides and residues by mid 2005
  - Have de-inventoried metal and oxides from Rocky Flats and Mound
- Will complete spent fuel removal from 8 of 10 basins by end of 2004
- High level waste treatment is fully funded and on track and liquid waste volumes in Hanford have been reduced from millions of gallons to less than 40,000
- Significant work scope has been slashed from the high level waste program for the same end product



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## **EM Risk Reduction Examples (Cont.)**

- Major closure sites remain on track for a 2006 completion
- Record amount of low level and transuranic waste have been safely removed from sites and disposed of in each of the last two years
- For the first time, for two consecutive years the life cycle baseline of the EM program has not increased and the schedule has not expanded



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## **Game Changing Strategies Are Being Implemented Elsewhere In DOE**

**These will all have the effect of improving the Environment or Safety**

- RW is committed to waste receipt in 2010
  - Goal to shave 20% from cost and more than a decade from the completion of initial consolidation
- FE – FutureGEN – state of the art power and hydrogen from coal without CO<sub>2</sub>.
  - FE is also on the front lines to resolve the natural gas shortage and fill the SPR
- EERE – A solid program to achieve a H<sub>2</sub> vehicle commercialization decision in 2015
- NE – A new Gen IV Reactor in Idaho (and possibly a new Gen III+ start) appear within reach



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## **Game Changing Performance and Initiatives (Cont.)**

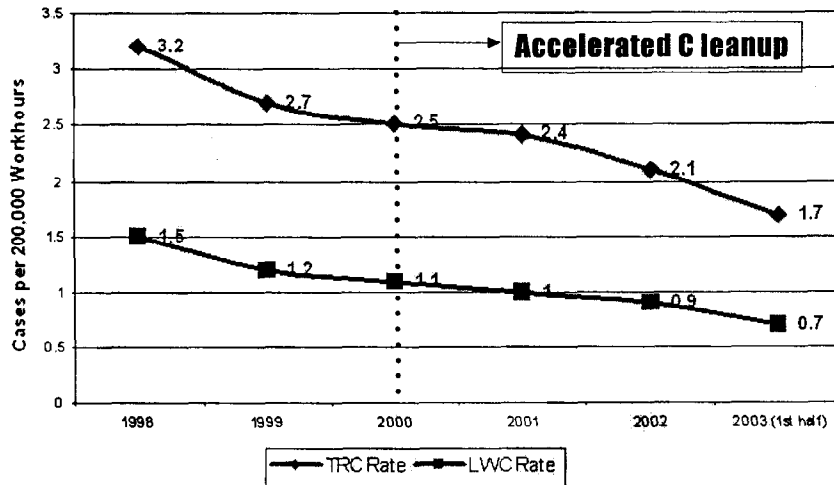
- OETD – New electricity technology and policy capability for blackout analysis and mitigation
- SC – Emerging renaissance in the physical sciences
  - Computational simulations, ITER, nanotechnology, genomics/proteomics and the new 20 Year Plan
  - Expected to result in breakthroughs in disease diagnosis and treatment and environmental protection
- WT / Legacy management – new mission, new strategy
  - public lands management cost effective excellence



## DOE-Wide OSHA Statistics Show Dramatic Improvements

### A 50% reduction in injury rates over the last 5 years

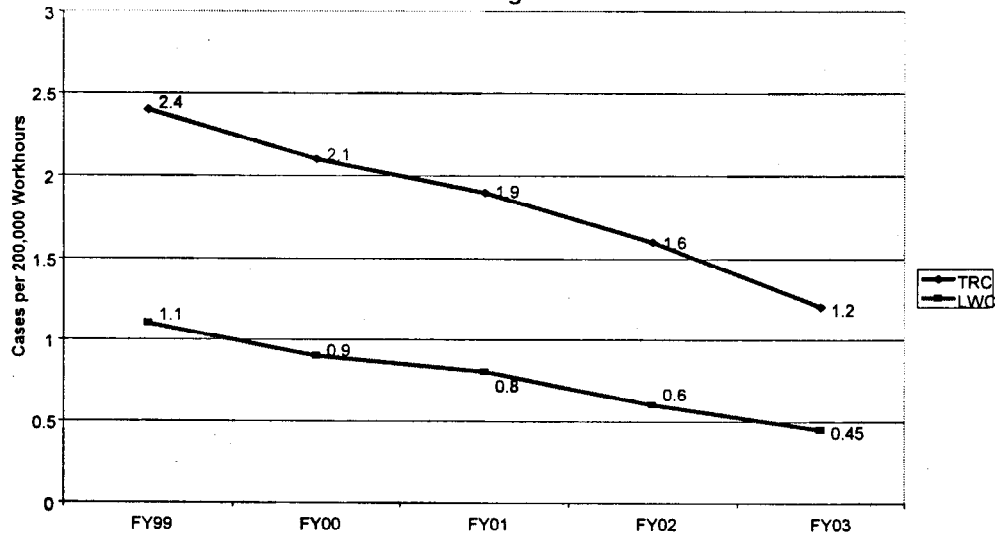
All DOE Total Recordable Case and Lost Workday Case Rates





# EM OSHA Statistics Show A 35 % Reduction Since the Beginning of Accelerated Cleanup

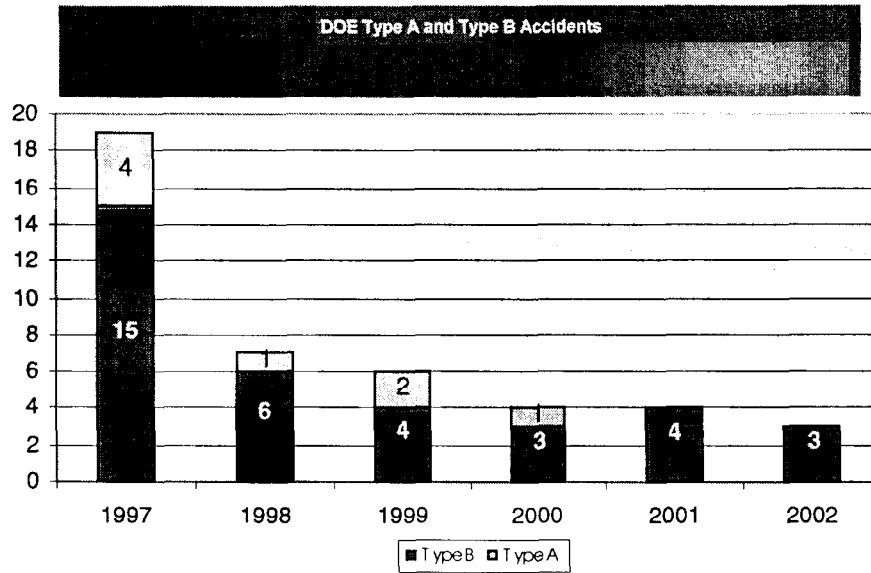
EM Average TRC and LWC Rates  
FY99 through FY03



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## DOE-Wide Type A and B Incident Rate Declining

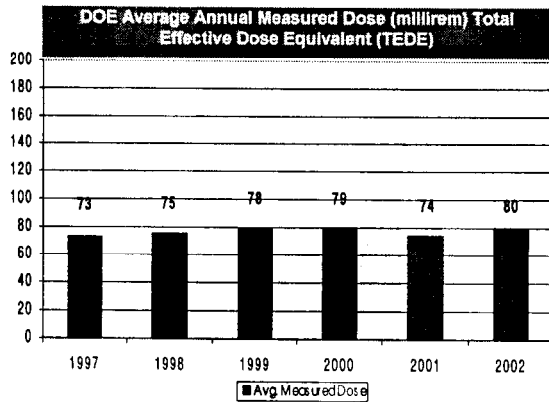


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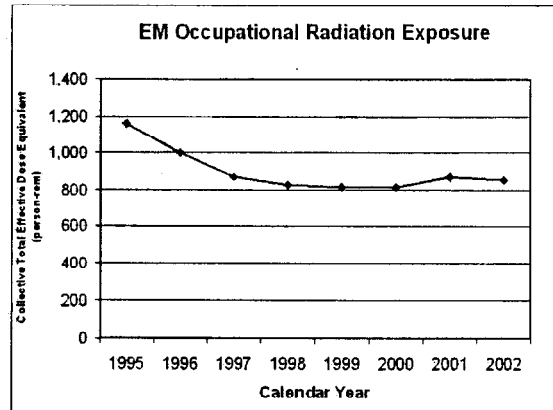




## EM Has Held Total Radiation Exposure Nearly Stable While Dramatically Accelerating Work



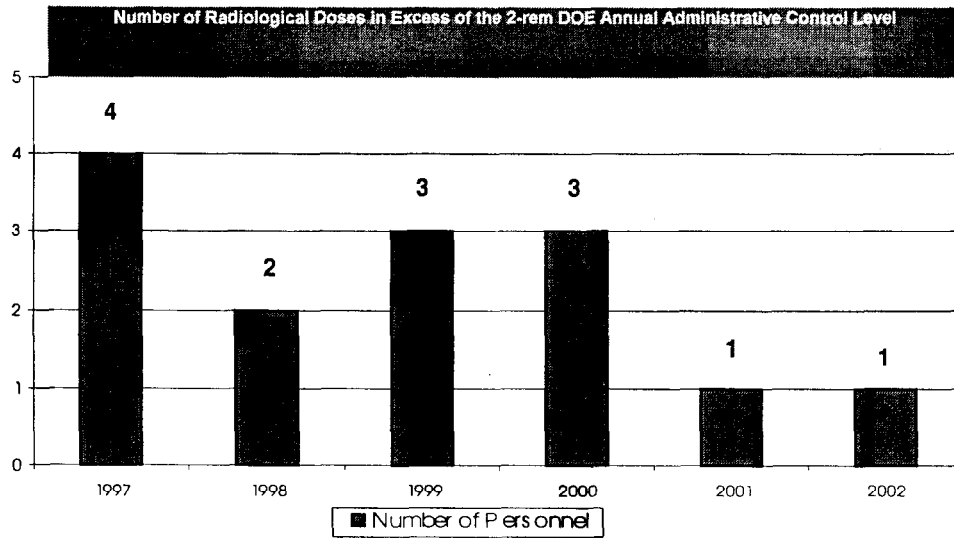
DOE



EM



## Radiologic Doses in Excess of Administrative Control Limits are Declining



DNFSB Oct 03, Slide



## **How Did DOE Achieve This Breakthrough and What are It's Plans to Continue It?**

- Foundations
  - President's Management Agenda
  - EM Top-to-Bottom review
  - Reyes Safety Systems Review
- Bring ISM to DOE Headquarters
- Leveraging DOE's outsourcing business model
- Site / program vision for excellence and corresponding performance measures
- Roles and responsibilities – Fed / contractor
- Requirements prioritization and simplification



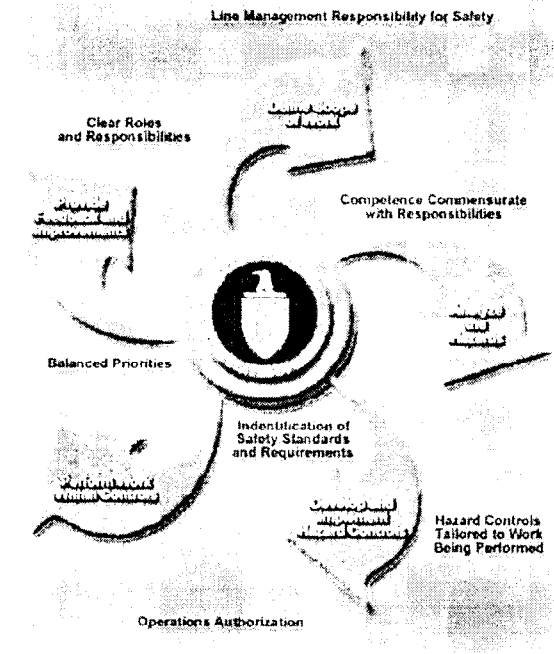
## **DOE's Actions and Plans (Cont.)**

- Work planning and budgeting
- Management oversight and corrective actions
- Corporate roles and responsibilities (OA, Under, etc.)
- Corporate mission alignment



## Bringing ISM to DOE Headquarters – Practicing What We Preach

- Integrated Safety Management
- 7 Guiding Principles
- 5 Core Functions





## **ISM at Headquarters (Cont.)**

- “Safety” is applied to Safety, Safeguards, Environment and Shipping QA – Integrated Safety Management Principles are the Same
  - Now moving to just “Integrated Management” bringing in all other management aspects
- Risk reduction and mission accomplishment are integral to safety performance
- The safest work is that which is eliminated while still achieving the same mission objective
- New emphasis – safety management of contract R&D and products – Hydrogen fuel and vehicle program



## **Leveraging DOE's Outsourcing Business Model**

- The Department was not capturing the benefits of its business model
- DOE had successfully federalized its outsourced work force by removing contractor accountability for workforce management and direction
- We are on a path to reconstruct and enforce this accountability to create a safer and more productive (risk reduction) work environment
- We are increasing contractor turnover where performance standards are not being met



## **Establishing a Vision for Each Site and Program**

- Underway at all sites / programs
  - EM, RW, H2 and SPR most mature
  - As much work to be done as yet accomplished
- Provides a master framework for project scoping, work planning, management strategy, acquisition strategy and requirements alignment
- Provides a platform for identification and deletion of unnecessary work scope (scope with no risk)





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## Roles and Responsibilities

- DOE and the contractors had overlapping, and therefore confusing roles and responsibilities
  - Example who is the “project manager”?
- DOE role as the project developer and investor, with the Contractor role as the implementer
- DOE manages the “contract” not the “contractor”
  - More systemic, less reactionary
  - Interventions by DOE signify a weakness in the contract or contractor that should be systemically corrected
- Building respect for the line management chain of command within DOE



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## Requirements Prioritization and Simplification

- DOE's system tended to treat all requirements and information equally, masking that which is truly first order
- DOE's requirements infrastructure creates redundant or irrelevant, and sometimes conflicting requirements that also distract from the priority tasks
- We have been and continue to engage in programs for requirements streamlining and simplification to bring clarity and focus to our requirements set



## Work Planning and Budgeting

- DOE's goals and funding requirements were ill defined leading to many discontinuities in work flow, which are generally adverse to safety and risk reduction
- The department has implemented a five-year budgeting cycle that combined with the site / program vision has lead to substantial improvement in work predictability
  - Coupled with detailed program plans for most sites
- Long term planning has enabled identification of hazards associated with future work (e.g., RW, H2)
- Implemented change control for scope adjustments
- Incorporating D&D planning in facility design



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## Management Oversight and Corrective Actions

- Executive safety and performance (risk reduction) oversight has been substantially improved
  - Every site has been personally visited (Ames Lab remaining)
  - Quarterly safety reviews with Under/Asst Secretaries of every site
  - Quarterly reviews of oversight findings and trends
  - Quarterly “Top 10” reviews of the most important / difficult projects
  - Real time reporting and reviews of key events
- Information from reviews is evaluated for generic implications and root causes



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## Management Oversight and Corrective Actions (cont.)

- Corrective actions are focused at the policy level
  - Work scope or planning concerns (e.g., 9/11 safety/security strategy)
  - DOE management or system weakness
  - Contract defects
    - » Contractor incentives, penalties and requirements
    - » Improved field enforcement for emerging issues
  - Contractor understanding and management capability
  - Lessons learned communication (e.g. LANL employee concerns)
  - Affect of proposed corrective actions on other system elements (unintended consequences)



## Corporate Roles and Responsibilities

- Implement new independent oversight model
  - Conversion of EH from independent oversight to safety and environment center of excellence and facilitator
- Implement line management through the under secretary and line accountability of the programs through the program owning assistant secretary's
- Clarify and simplify program-to-field chain of command
- Increase planning and performance integration between key functions such as EM, NNSA, NE, RW and SC
- Clarify the current and future scope of EM and other programs



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## **Corporate Mission Alignment**

### **In 2001, National Security Was Made DOE's Unifying Mission**

– It Remains So Today

- Primary Mission Elements
  - Economic security – clean, reliable, economic energy supply
  - National security
    - » Defense and Homeland Security
    - » Counter Terrorism and Critical Infrastructure Protection
- Enabling Mission Elements
  - Environmental management of the primary mission elements
    - » Remediation
    - » Waste management
    - » Emissions management – water, air (carbon), soil, etc.



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## **Future Challenges**

### **While Much Has Been Accomplished, More Remains**

- We know from commercial and DOE benchmarks that continued improvements in safety and productivity are achievable
- Improvement in all the areas described above
- Improvement in contractor management capability and capacity
- Ensuring that Columbia-type issues don't arrive undetected through the "back door"





## Future Challenges (Cont.)

- Safety concerns continue
  - Keeping pace with work acceleration
  - Overconfidence (previously good sites have stumbled)
  - Near misses (esp., electrical, hoisting/rigging, lockout-tagout)
  - Indicators of systemic deficiencies (financial, security, property, etc.) – discovering hidden erosion of the safety infrastructure
  - Shipping QA
  - Worker transition management
  - QA systems development and implementation
  - Improved QA for new construction
  - Improved indicators for leading indicators of safety
  - Employee concerns program



## The Next Plateau

- DOE looks forward to building on its safety partnership with the DNFSB to help it achieve the next plateau in safety and risk reduction.
  - Further expedite public and worker risk reduction while achieving new safety benchmarks
  - Decrease risk by discovering and eliminating unnecessary scope from the work
  - Clarify and streamline requirements to make the most important of them more prominent and visible
  - Identify issues and controls at the highest and most systematic levels for maximum leverage in corrective actions



## Summary

- DOE is recovering from many safety and environmental challenges of its past
- DOE and contractor had and have bright and capable workers
  - The systems we created were the problem, not the workers
- Safety and performance is improving
- We are not satisfied and many opportunities for improvement remain



As Under Secretary, Mr. Card has line responsibility for Departmental operations in Energy, Science, and Environment. Energy responsibilities include renewables, fossil, nuclear and nuclear fuel cycle management, space nuclear power, power transmission, energy conservation and energy efficiency standards. In the area of science, the Department is the largest federal funder for physical sciences covering 14 national laboratories plus university and commercial research engagements. Major elements include basic energy sciences, high energy and nuclear physics, biological and environmental sciences, fusion energy and computing. Environmental operations include nuclear waste management, spent fuel retrieval from commercial, defense and international sources, and remediation of the nuclear weapons complex. Example activities of the Under Secretary during this tenure include responsibility for:

- Implementation of the President's Clean Coal and FreedomCar initiatives
- Reconfiguration of the Environmental Management program to complete public and worker risk reduction nearly 40 years earlier for over \$50 billion of cost savings
- Siting and development of the Nation's high level nuclear waste repository
- Chair of the Interagency Working Group on Climate Change Science & Technology
- Filling the Strategic Petroleum Reserve to its full capacity of 700 million barrels
- The Secretary's Nuclear Power 2010 initiative
- Management improvement initiatives including safety and security improvements, DOE order and requirements streamlining, and project management improvements

Prior to his DOE employment, Mr. Card was President and CEO, Kaiser-Hill Company, LLC. In that role he was responsible for the \$7 billion, 5,000 employee, cleanup and closure of the US Department of Energy's (DOE's) Rocky Flats site, which was formerly one of the nation's five primary nuclear weapons production sites. The plant, which contained the largest unfinished plutonium stockpile in the nation, is located in the Denver, Colorado metropolitan area. After assuming responsibility for the project in 1995, Mr. Card restructured site operations and the closure strategy to advance the planned closure schedule of 2065, at a cost \$37 billion to a closure goal of 2006, and a total cost of approximate \$7 billion.

Mr. Card also served as a Director and Senior Vice President at CH2M HILL Companies, Ltd. The Company had revenues of about \$2 billion and was one of the world's larger science, engineering, construction and operations firms. The corporation had major practices in the areas of energy & environment, water, transportation, and industrial manufacturing. Prior to the Rocky Flats assignment, Mr. Card served as Group

Executive, Environmental Companies, responsible for the energy and environmental business, which was the firm's largest business practice. This business served a variety of customers including the federal government, electric utilities, oil and gas companies and other industries. Mr. Card personally managed the design and construction management of an award-winning heavy oil production project in Canada.

Mr. Card completed the Program for Management Development at Harvard Business School; received a M.S. in Environmental Engineering from Stanford University; and a B.S. in Civil Engineering from the University of Washington.