



U.S. Department of Energy  
Office of Civilian Radioactive Waste Management



# Yucca Mountain Project Evolution

Presented to:

**Society for Effective Lessons Learned Sharing (SELLS)**

Presented by:

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**Deputy Director**

**OCRWM Office of Repository Development**

**April 12, 2006**

**Las Vegas, NV**

# Mission

- Mission:

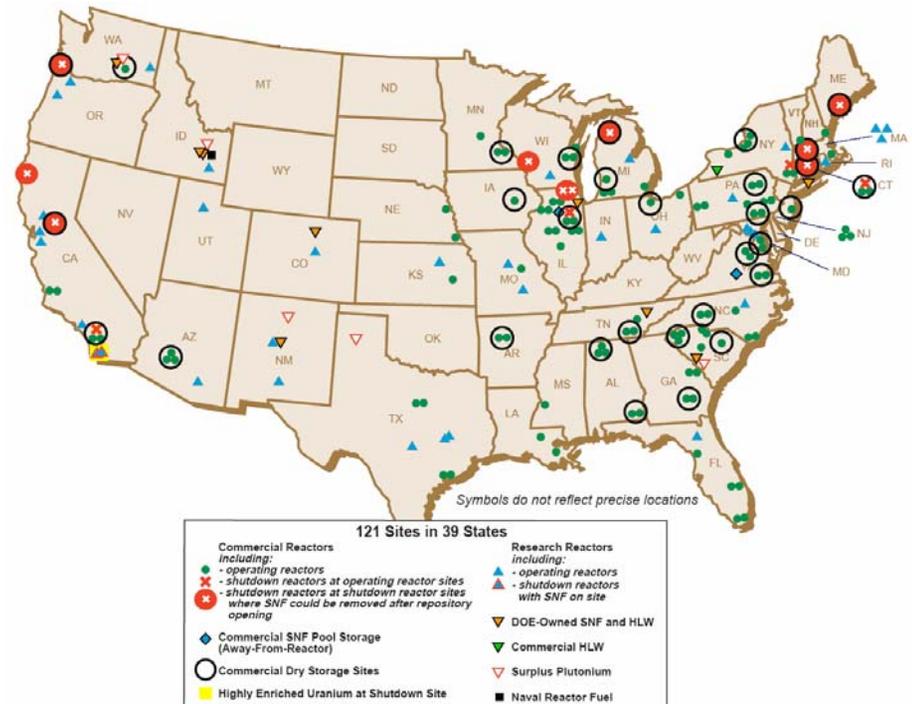
- Our mission is to **manage and dispose** of high-level radioactive waste and spent nuclear fuel in a manner that **protects health, safety, and the environment**; **enhances national and energy security**; and **merits public confidence**

- Priorities:

- After 20 years of scientific study, Congress **passed a joint resolution** in 2002 to designate the Yucca Mountain site for repository development and enable DOE to move ahead to submit a license application for repository construction authorization
- Protecting public health, safety, and the environment remains our top priorities

Current locations of spent nuclear fuel (SNF) and high-level radioactive waste (HLW) destined for geologic disposal:

121 sites in 39 states

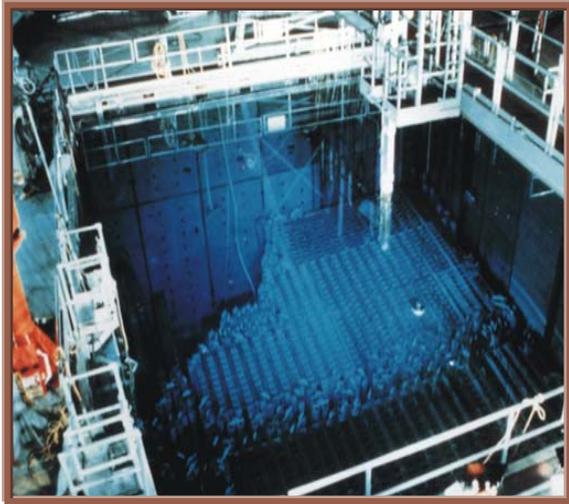


As of February 2006



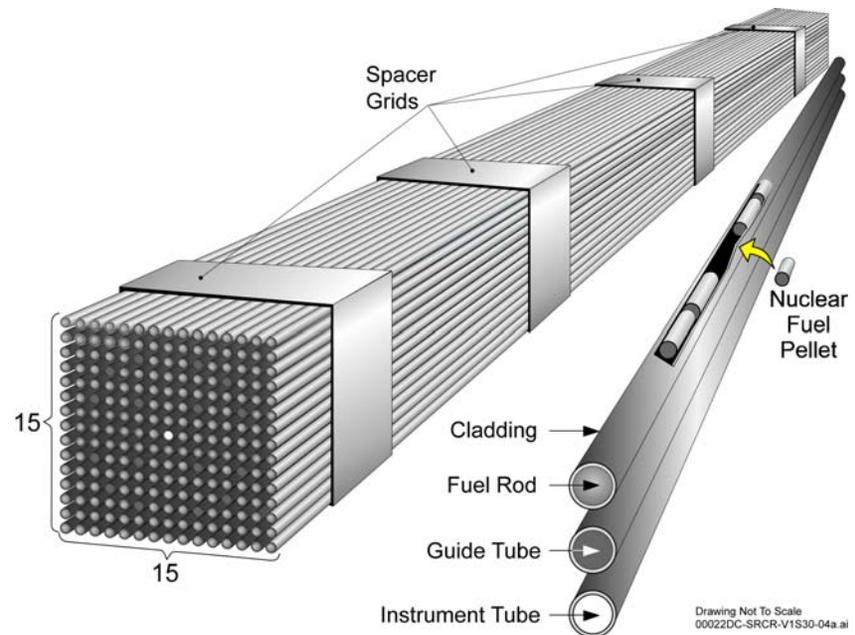
# Spent Fuel Statistics

Spent fuel is stored in large pools of water to shield its radioactive properties



Or, spent fuel is stored in above-ground dry casks

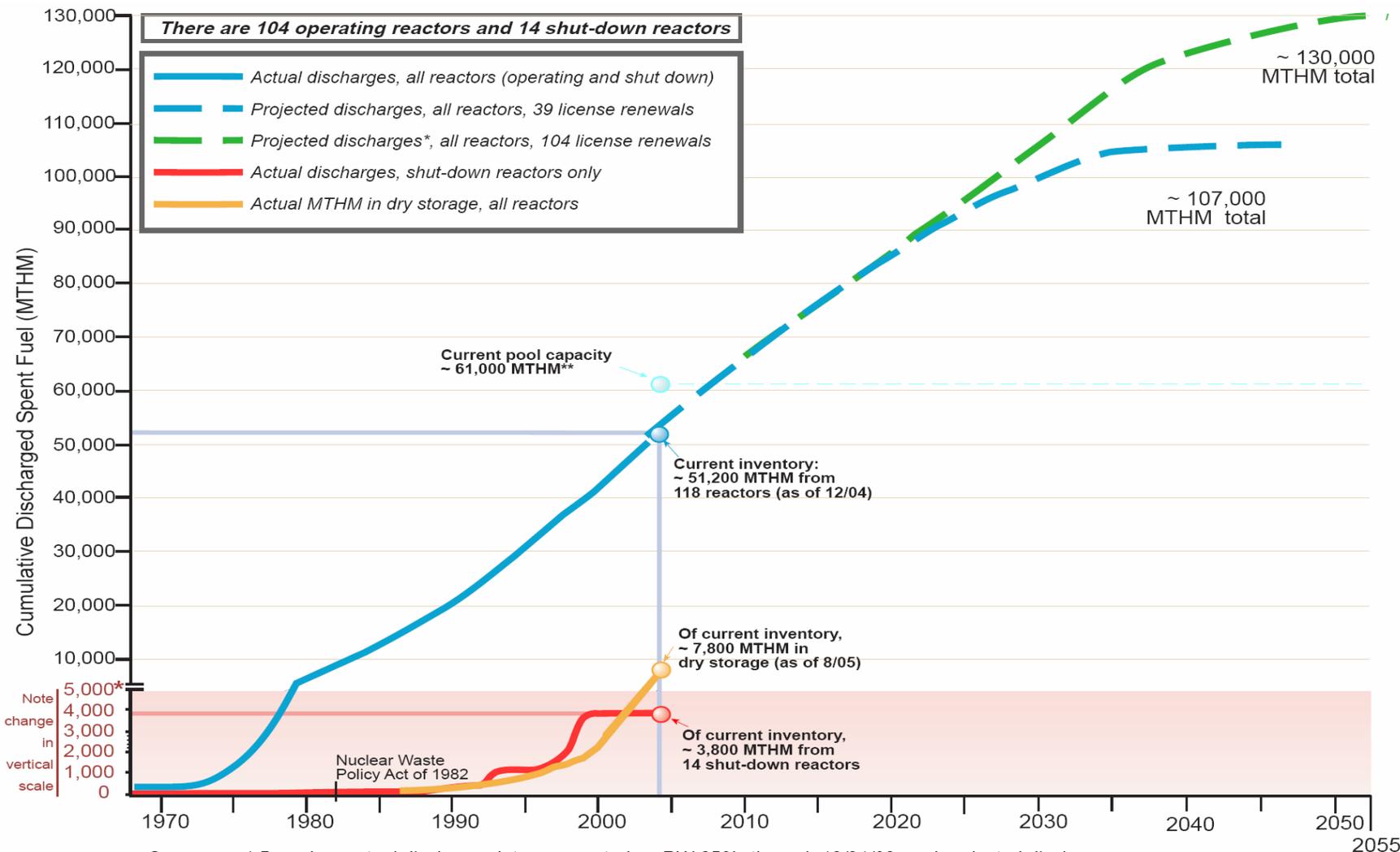
- Nuclear power plants are producing about **20% of the electricity in the U.S.**
  - 72 plant sites with spent fuel
  - 39 states with spent fuel
  - 51,200 metric tons of spent fuel existed in March 2004
  - 119,000 metric tons of spent fuel projected by 2035
- **5 DOE sites with spent fuel**



Spent Fuel Assembly



# Commercial Spent Nuclear Fuel Discharges



Sources: \* Based on actual discharge data as reported on RW-859's through 12/31/02, and projected discharges, in this case 2003-2055, based on 104 license renewals.  
 \*\*Based on pool capacities provided in 2002 RW-859 (less FCR) and supplemented by utility storage plans.

Discharge Curves 122805.FH10

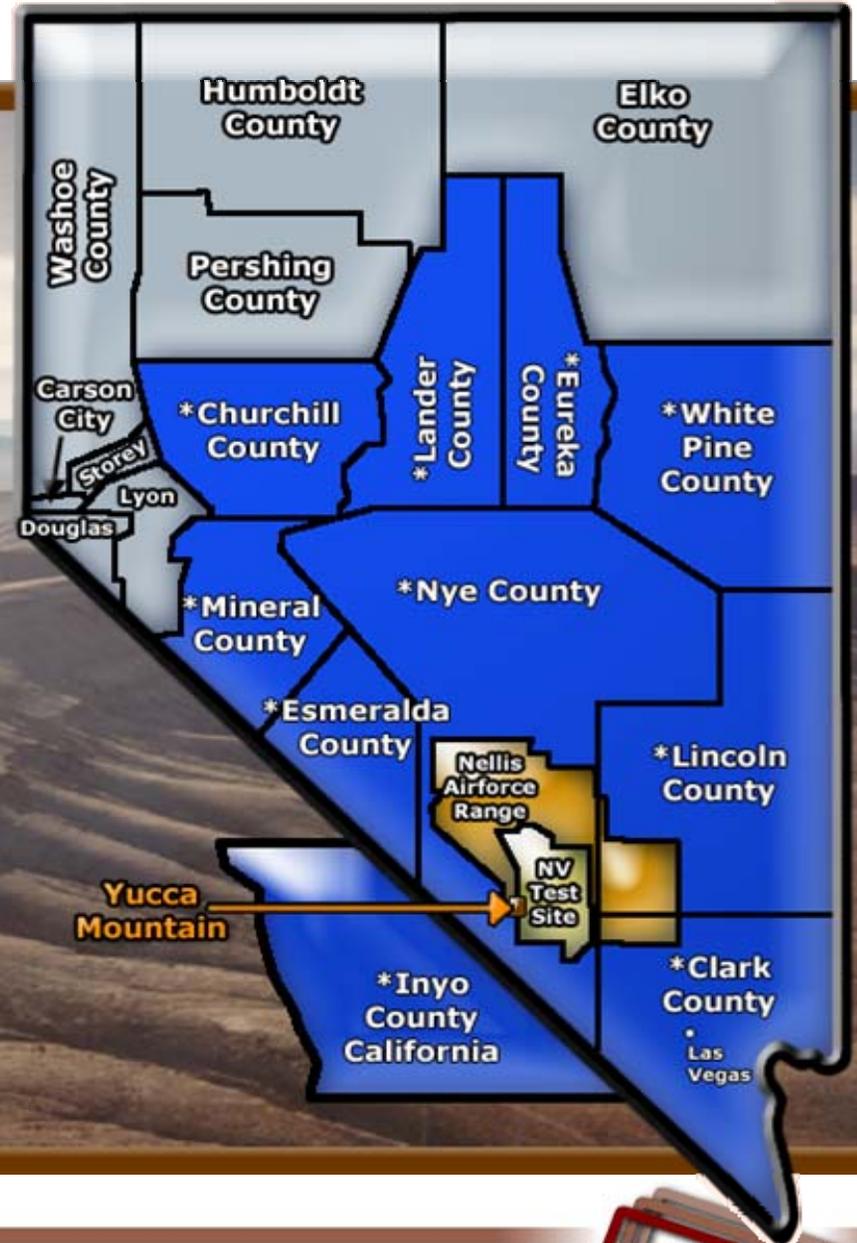
As of December 2005



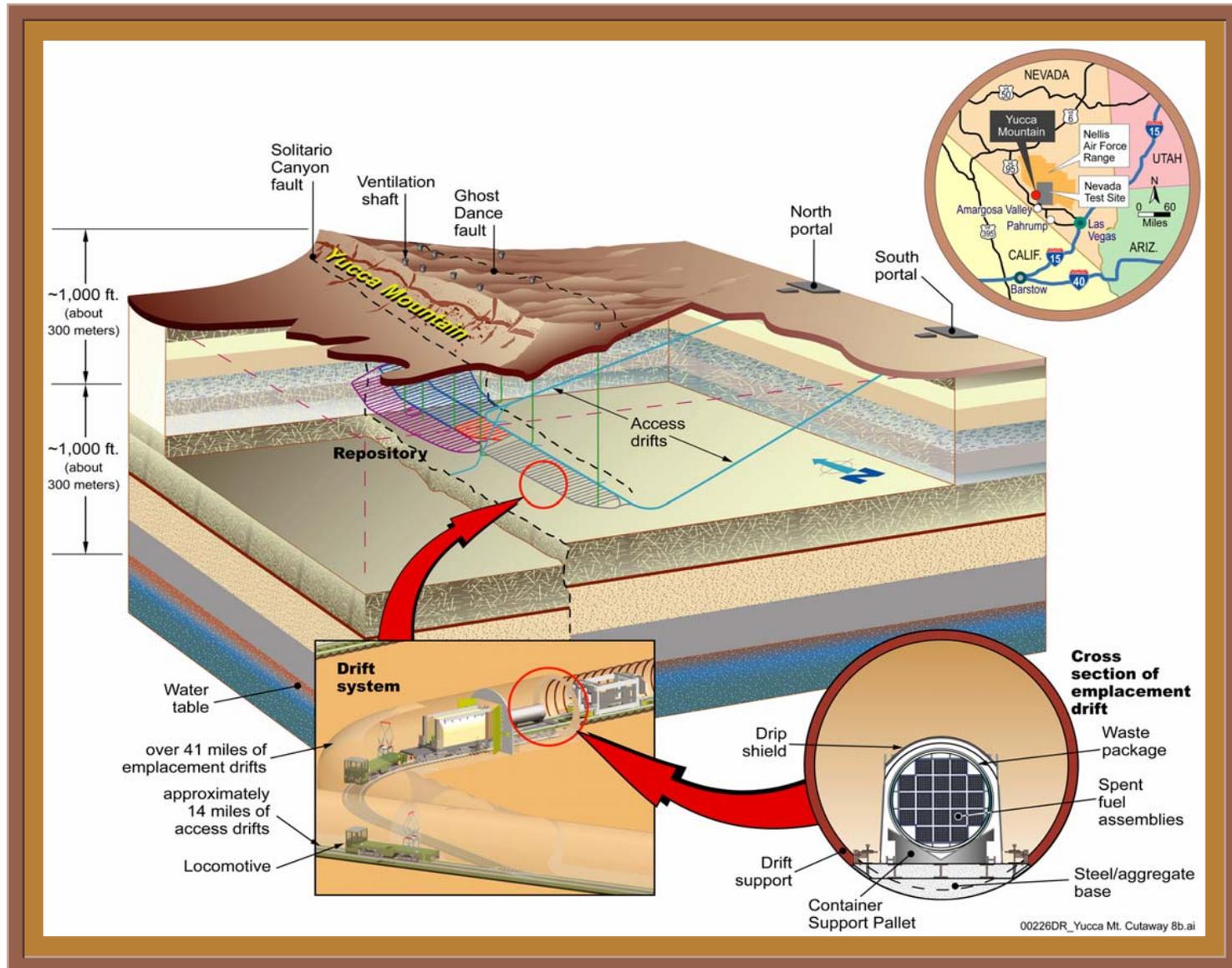
# Location of Yucca Mountain, Nevada

**\* Counties Designated as Affected Units of Local Government**

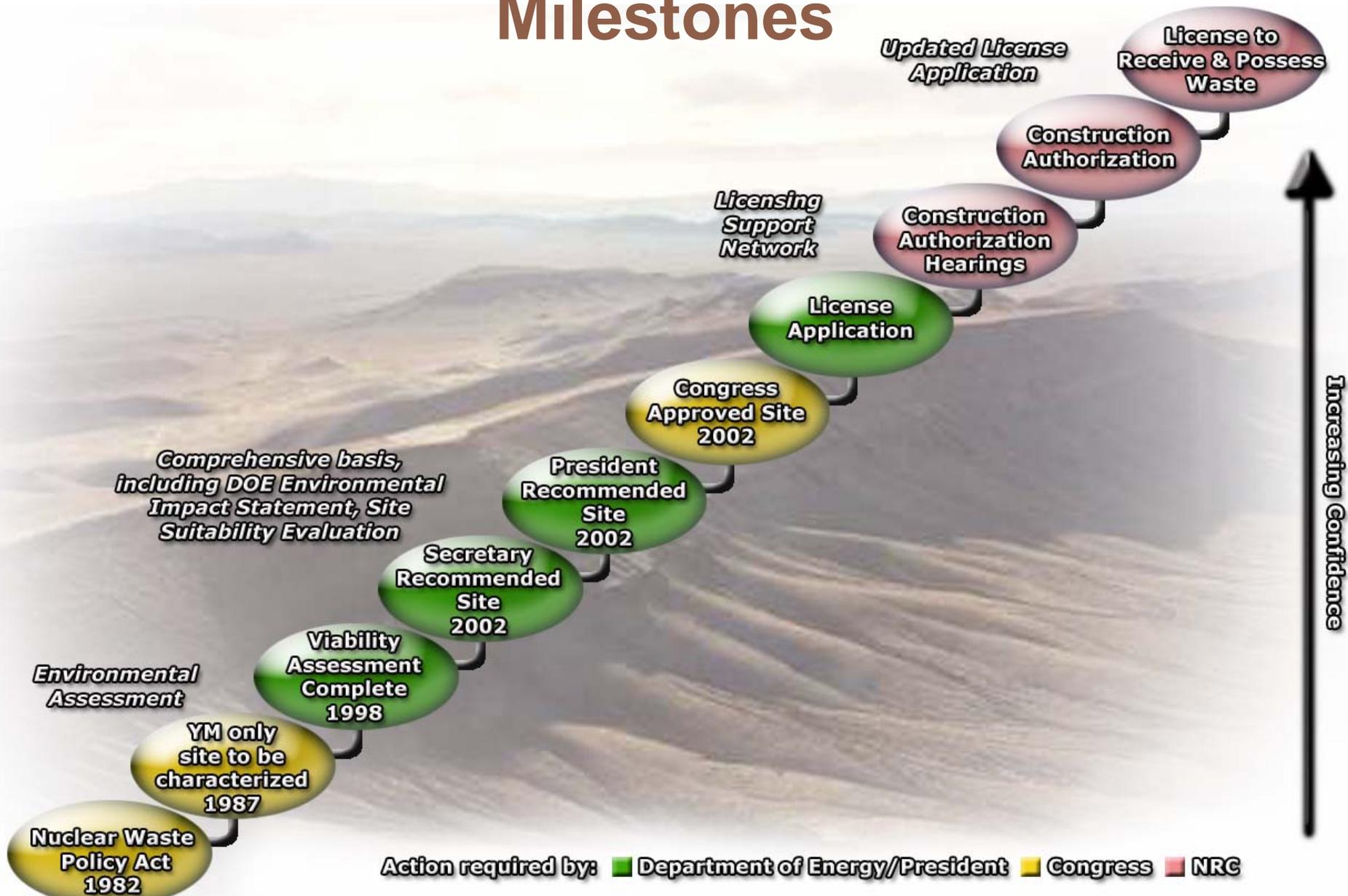
- 100 miles northwest of Las Vegas in Nye County
- Located on western boundary of the Nevada Test Site, a U. S. Department of Energy (DOE) facility



# Repository Reference Design Concept



# Milestones



# Major Attributes of Our New Approach

- On October 25, 2005, we announced a new plan that would operate the Civilian Radioactive Waste System with a canister based approach that minimizes bare fuel handling
  - Canisters arriving at the repository will be disposable after being placed in a waste package
  - A minimum bare fuel handling capability will be developed that will also be used for off-normal operations with remediation capabilities
  - Aspects of the current design will be utilized to the extent practicable
  - The phased construction approach will be maintained
  - There will be an included capability for both truck and rail deliveries

**Simpler**  
**Cleaner**  
**Safer**

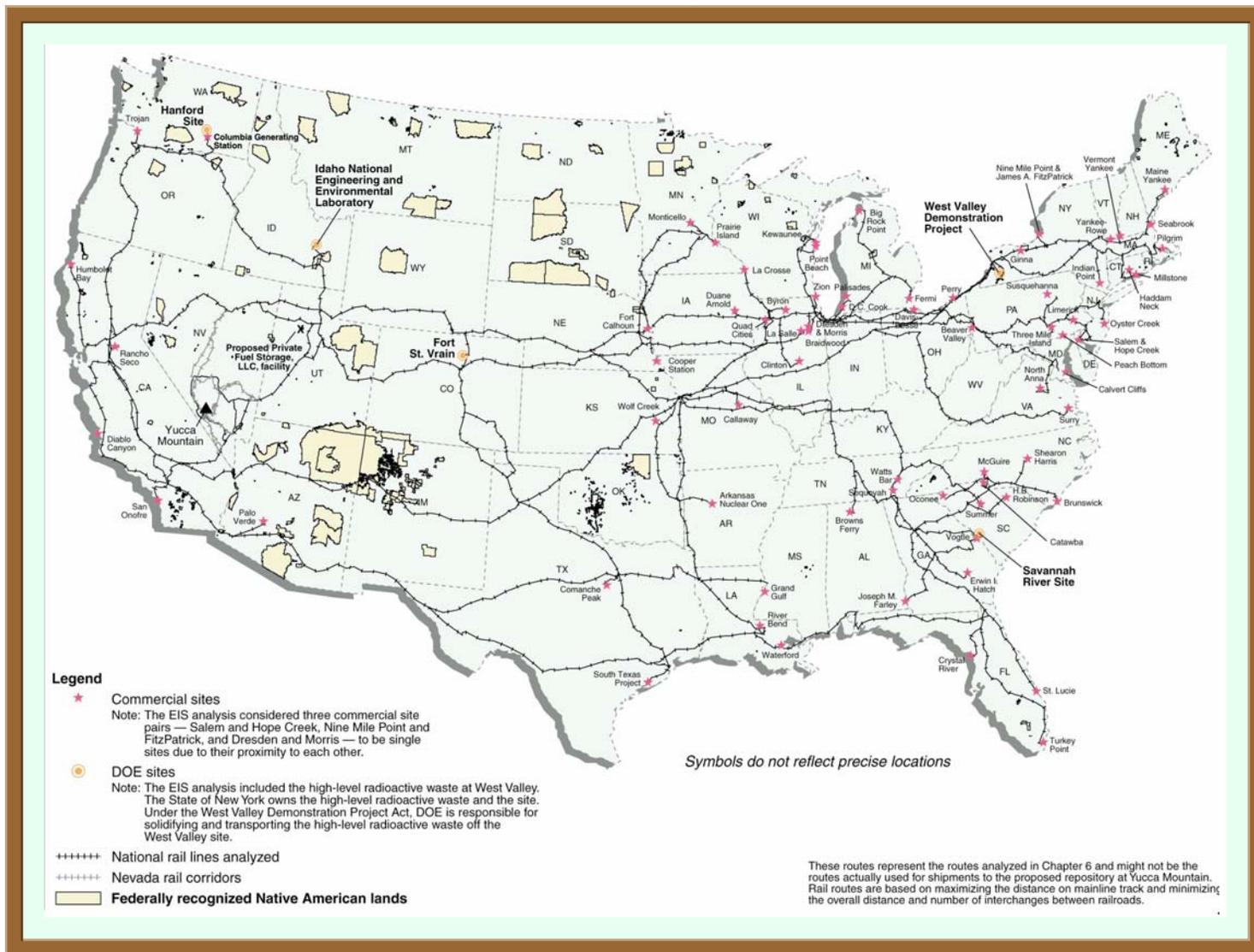


# Transportation

- Spent nuclear fuel shipments in the U.S. carry impressive safety record
  - Over 3,000 shipments in the U.S. during the past 30 years
  - 754 Navy container shipments, traveling over 1 million miles since 1957
  - There has never been a release of radioactive material harmful to the public or the environment
- Waste Isolation Pilot Plant (WIPP) has completed more than 4,400 shipments as of March 2006
- DOE follows DOT and NRC transportation rules now and will follow or exceed any others that may be established in the future
- Emergency responders would be trained prior to shipments
- More than 70,000 metric tons of spent nuclear fuel have *already* been shipped safely in densely populated Europe; France and Britain average 650 shipments per year



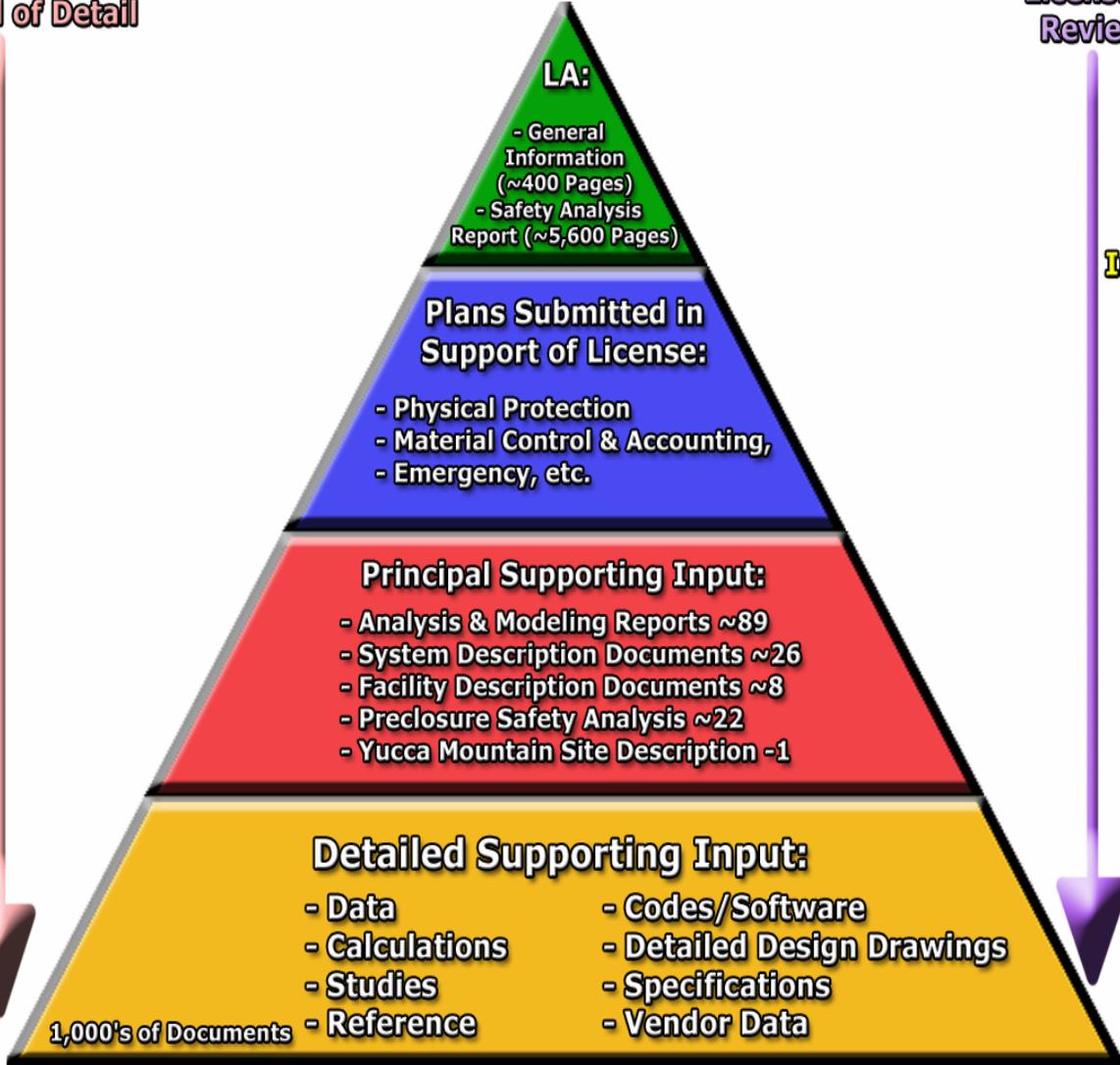
# Rail Routes Analyzed in the Final Environmental Impact Statement



# License Application Content and Supporting Documents

Increasing Level of Detail

- **General Information (GI)**
  - General Description
  - Proposed Schedules for Construction, Receipt and Emplacement of Waste
  - Physical Protection Plan
  - Material Control and Accounting Program
  - Site Characterization
- **Safety Analysis Report (SAR)**
  - Repository Safety Before Permanent Closure
  - Repository Safety After Permanent Closure
  - Research and Development Program to Resolve Safety Questions
  - Performance Confirmation Program
  - Administrative and Programmatic Requirements



Licensing Review

Inspection



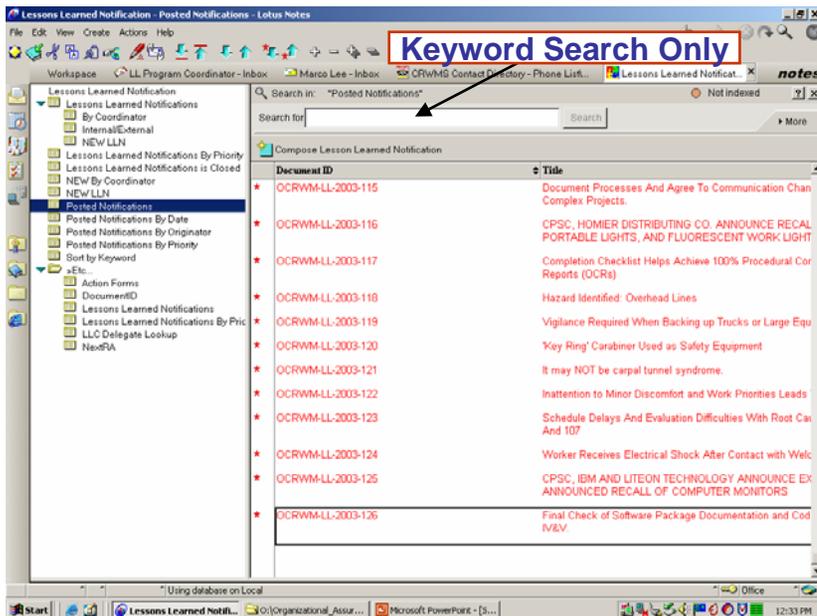
# Corrective Action, Trending and Lessons Learned

- **Nuclear Regulatory Commission Licensee**
- **Project-wide Corrective Action Program (CAP)**
  - Encourage employees to self-identify issues
  - 6,500 issues currently in the CAP system
  - Current focus is on trending and from data, generating lessons learned
  - Approximately 120 lessons learned initiated annually

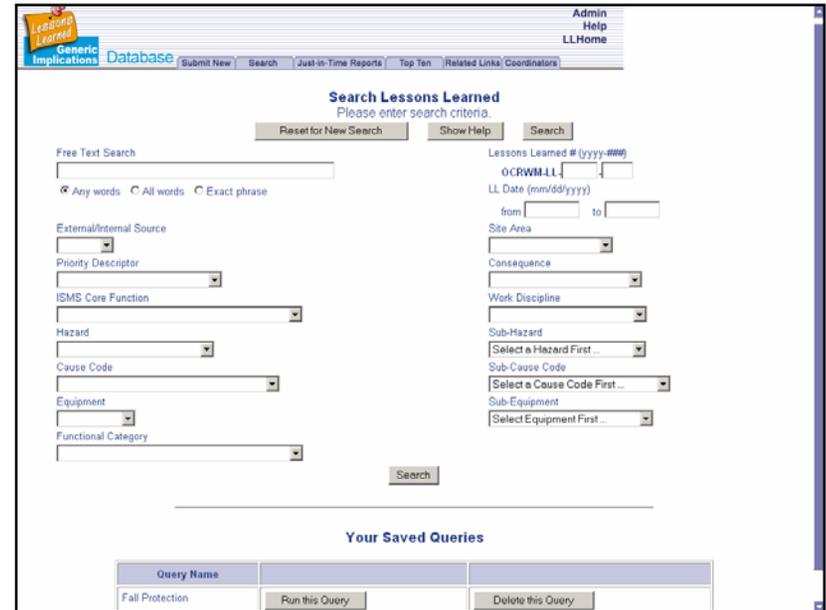


# Lessons Learned Evolution

## Past (1999-2003)



## Present (2003→)



- Lotus Notes based database
- Search limited to Keyword only

- Web-based database
- Search on 16 fields simultaneously



# Lessons Learned Evolution (cont.)

## Past

The screenshot shows a Lotus Notes window titled '(Untitled) - Lotus Notes'. The main content area has a green background and contains the following text:

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT  
LESSONS LEARNED  
ACTION RESPONSE

DOCUMENT IDENTIFIER: OCRWM.LL.1999.001  
Title: EBF Pad Drilling Incident  
ACTION: Reviewed  
STATUS:  
 Action Taken  
 Action Planned

AFFECTED LESSONS LEARNED COORDINATOR: Sheryl Monse/YD/RWDOE  
Reply to Program Coordinator

ENTERED BY: Sheryl Monse/YD/RWDOE  
DATE: 09/11/2000 04:40 PM

Export Date:

The interface includes a standard Lotus Notes menu bar (File, Edit, View, Create, Actions, Help) and a toolbar with various icons. The taskbar at the bottom shows the Start button and several open applications.

- Text Only Response Form

## Present

The screenshot shows a web-based form titled 'OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT LESSONS LEARNED ACTION RESPONSE'. The form is structured with several sections and checkboxes:

DOCUMENT IDENTIFIER: OCRWM.LL.2001.002  
Title: Enrichment Output Including OTRs Are Correct, Accurate, And Technically Appropriate  
Coordinator: David Bruch

Document results of actions below in 'Feedback/Additional Comments':

Lessons Learned Evaluated - Does Apply. The following actions were taken:

- Forwarded to appropriate personnel via email.
- Initial entry on 7/24/03: Forwarded to assess training program owner and determine the whether training to determine applicability and action.
- Updated entry 08/28/2003: Not applicable to engineering personnel.
- Discussed with staff in meeting.
- Proposed Action taken.
- Revised Policy, Desk Instruction, or Procedure Change.
- Other Action taken.

Lessons Learned Evaluated - Does Apply - No Action Necessary because:

- Our processes, practices, culture already reflect the lesson that was learned.
- Other.

Lessons Learned Evaluated - Does Not Apply because:

- Does not relate to job function.
- Other.

Feedback/Additional Comments:

Final Response: Once you check this box and submit your response, you will not be able to edit this response again unless you receive permission from an LLFC.

Submit to Program Coordinator

- Pre-formed response options and text fields
- Required Action and Final Response functionality



# Lessons Learned Evolution (cont.)

## Past

- No feedback or indication of use

## Present

Identifier: OCRWM-LL-2006-052

How useful did you find this lesson?

Very Helpful    Helpful    Neutral    Little Value Added    No Value Added

What are you using this LL/GI document for?

Increased Personal Awareness  
 Safety/Quality Topic  
 Pre-Job Brief: [WP#]  
 Incorporation into Work Activity  
 Procedure: [#]  
 Training: [#]  
 Work Order: [#]  
 Planning/Scheduling  
 Job Process: [ ]

Do you have any comments about this lesson?

[Text Area]

(2500 characters left.)

Submit Cancel

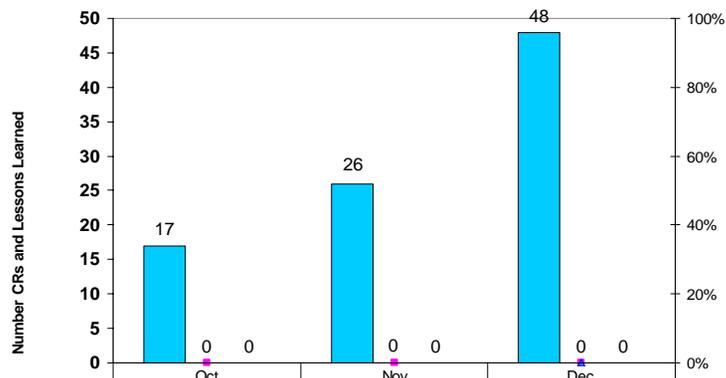
- Feedback form pops up when exiting a lessons learned
- Ties use to specific activity



# Lessons Learned Evolution (cont.)

## Past

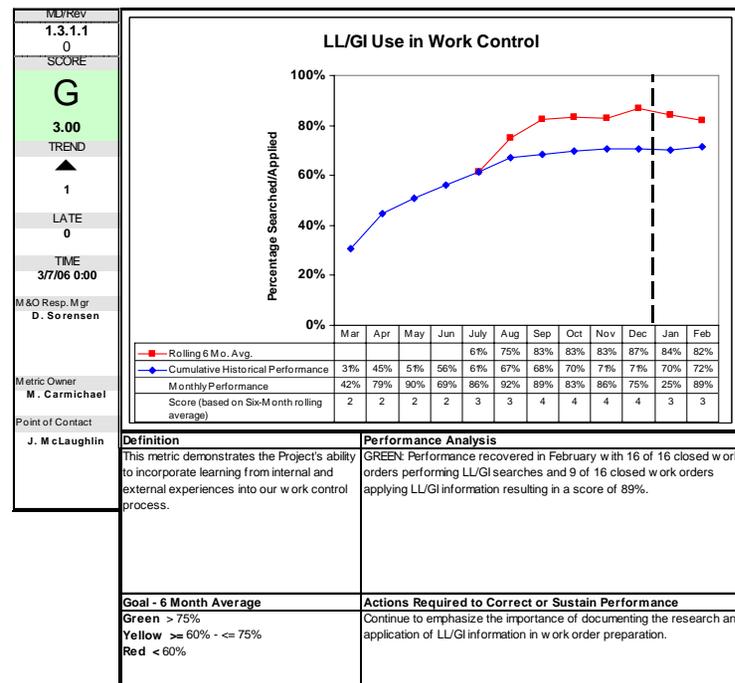
Lessons Learned from Level A and B Condition Reports



Closed Level A & B CRs	17	26	48
LL/GI Required = "Yes"	0	0	0
Lessons Learned Actually Produced	0	0	0
Produced/Total Received (%)	0%	0%	0%
3 Mo. Avg. Produced/Total Received (%)			0%

– Non-uniform, ad-hoc metrics

## Present



– Formal Performance Indicator Panel metrics based on Energy Facility Contractors Group (EFCOG) model



# Lessons Learned Evolution (cont.)



## Infrastructure

Procedure, Process,  
Database, Roles &  
Responsibilities



## Awareness

Project personnel  
are aware of the  
program and the part  
they play in it



## Integration

All applicable  
processes tie to  
lessons learned and  
vice versa



## Use

Lessons Learned are  
used to improve  
safety, quality and  
best business  
practices



# Lessons Learned Evolution (cont.)

## Future

- **DOE Operating Experience Order**
- **Integral to the Engineering, Procurement, and Construction Phase**
- **Measure Use in Other Areas Beyond Work Control (i.e. Procedures)**
- **Second Nature for Employees to Apply Lessons Learned:**
  - **During Development of New Processes**
  - **During the Implementation of New and Existing Processes**
  - **When Archiving Old Processes**

