

Evaluation of Chemical Inventory Systems for Emergency Management across the DOE Complex

Reed Hodgkin

Terry Brog

Derek Skene

AlphaTRAC

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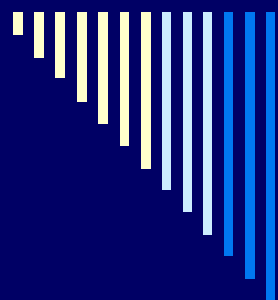
Acknowledgements

- DOE HQ NA-41 – Jim Fairobent
- SRS – Jim Morgan, et al.
- SNL/NM, SNL/CA – Randy Castillo, Mark Brynildson
- BNL – Bob Petrocek
- LANL – Helena Whyte, Jonathan Tapia
- PNNL – Kathy Ertell
- Sites canvassed - numerous



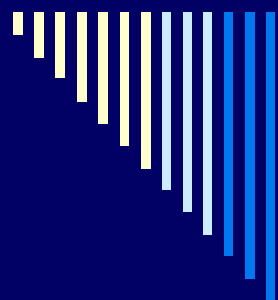
Approach

- 3-month study
- Qualitative interviews of CIS stakeholders
- 5 DOE sites visited
- 10 DOE sites canvassed by phone
- Focus on Emergency Management needs
- Issues and gaps identified – field perspective
- Best practices and recommendations



DOE Sites Visited

- Brookhaven National Laboratory
- Los Alamos National Laboratory
- Pacific Northwest National Laboratory
- Sandia National Laboratories/NM
- Savannah River Site



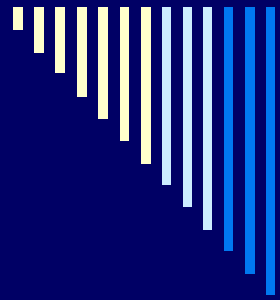
DOE Sites Canvassed

- Argonne National Lab
- Hanford (Fluor)
- Idaho National Lab
- Lawrence Berkeley National Lab
- Lawrence Livermore National Lab
- Nevada Test Site
- Oak Ridge National Lab
- Pantex Plant
- Sandia National Lab/CA
- Stanford Linear Accelerator Center



Site Selection Process

- Discussion with Jim Fairbent
- OA audit findings review (5/02 to 9/05)
- Cross section of DOE sites
 - n Lead program office for site
 - n Type of operations (Production, R&D)
 - n Size, diversity of operations
 - n Type/quantity of hazards



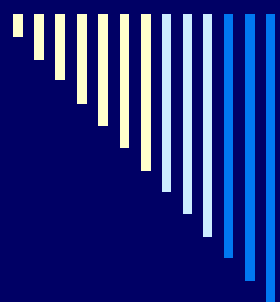
CIS Characteristics of Interest

- System design
- Content accuracy
- Content consistency
- System linkage
- Intended use versus adapted use
- Tracking and inventory updating processes



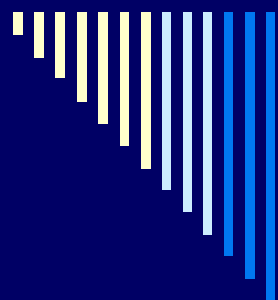
Value to Emergency Management

- Hazards survey/assessment support
- On-going preparedness
 - n Day-to-day hazards monitoring
- Emergency Response
 - n Real-time information on hazardous materials at risk
- To increase CIS value
 - n Understand key CIS features to meet Emergency Management needs
 - n Identify cost-effective actions to improve CIS performance



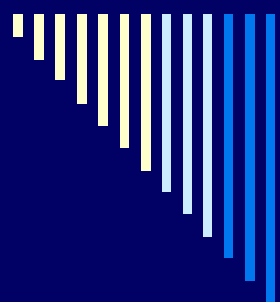
Key CIS Features

1. Captures key chemical container characteristics
2. Integrated with chemical procurement system
3. Direct link to each chemical MSDS
4. Ensure CIS interface is user-friendly



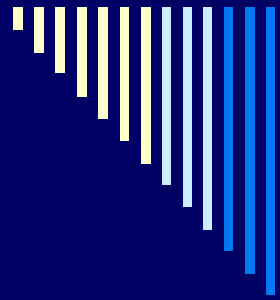
Key CIS Features

5. Include maximum quantities for non-exempted chemicals
6. Implement data-quality programs for EM use of CIS
7. Information available to EM through user-generated reports



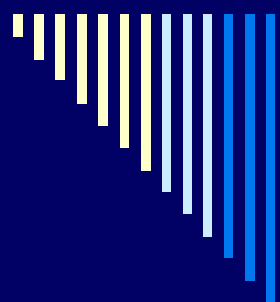
Key CIS Features

8. Automated notifications built in to CIS
9. Integrated with other hazardous chemical tracking systems
10. Develop formal training for CIS users
11. Provides real-time access to up-to-date information



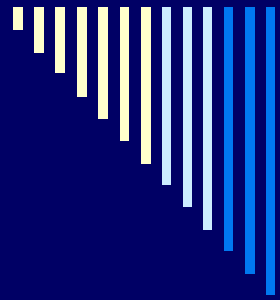
Key CIS Features

12. Captures and retains information on historical usage of hazardous materials
13. Used to reduce or eliminate hazardous materials
14. Design is flexible and supports current and anticipated EM needs



1. Captures key chemical container characteristics

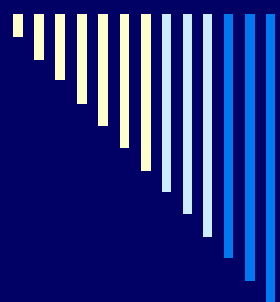
- Physical property information
- Dispersibility
- NFPA Health Hazard rating
- Container identifier (bar code)
- Container type/quantity/location/owner



1. Captures key chemical container characteristics

Implementation

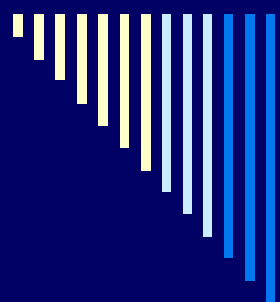
- CIS/EM identify key characteristics needed by EM
- Graded approach



1. Captures key chemical container characteristics

Best Practices

- Several sites capture most chemical and container characteristics
- Data gaps identified by most sites and being addressed
- Data accuracy (chemical location, disposed chemicals) is common concern across all sites



2. Integrated with chemical procurement system

- Hazards tracked proactively
- Leverage guidance of DOE Handbook on Chemical Management – Volume 2: *Chemical Safety and Lifecycle Management*



2. Integrated with chemical procurement system

Implementation

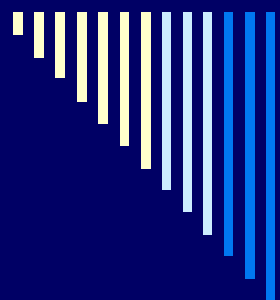
- Coordination between chemical procurement, Emergency Management, CIS Management
- Identify data available at point of purchase and drive data format for input to the CIS



2. Integrated with chemical procurement system

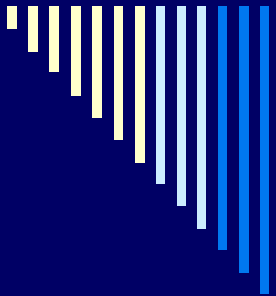
Best Practices

- Two sites have fully integrated their CIS with the sites chemical procurement system.
- Excess inventories and hazards level reduction is key outcome
- Awareness of potential consequences to EM before purchase



3. Direct link to each chemical MSDS

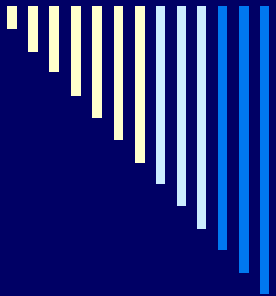
- Linking data to MSDSs allows EM responders rapid access to detailed hazards information
- Implemented at many sites



3. Direct link to each chemical MSDS

Implementation

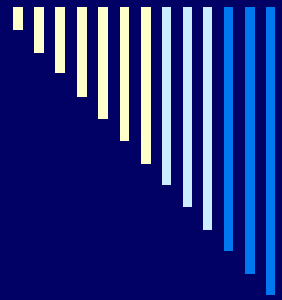
- Capability can be implemented by hyperlinks for the CIS to the MSDS



3. Direct link to each chemical MSDS

Best Practices

- Value of this linkage has been recognized by most sites and has been built into diverse CISs



4. Ensure CIS interface is user-friendly

- Browser-based
- Intuitive, easy to use
- Continuously available
- Remote access for authorized users



4. Ensure CIS interface is user-friendly

Implementation

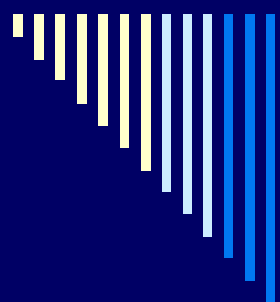
- CIS staff and EM collaborate to determine appropriate level of sophistication needed to use CIS



4. Ensure CIS interface is user-friendly

Best Practices

- Several sites have CIS interface as intuitive as other applications used by emergency responders
- Significant effort to ensure high level of user satisfaction
- Helps drive correct, timely emergency response decision



5. Include maximum quantities for non-exempted chemicals

- Allows emergency planners to quickly meet DOE O 151.1C requirement to use maximum inventory quantities in preparation of hazards surveys and hazards assessments



5. Include maximum quantities for non-exempted chemicals

Implementation

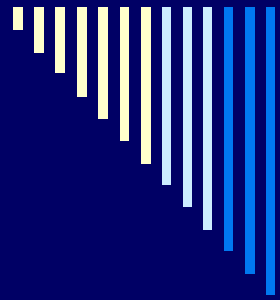
- Identify DOE O 151.1C allowed exemptions
- Flag non-exempted chemicals
- Identify planning inventory by chemical by facility
- Compare planning inventory to actual inventory and threshold



5. Include maximum quantities for non-exempted chemicals

Best Practices

- In practice at one site evaluated
- Under evaluation by several sites



6. Implement data-quality programs for EM use of CIS

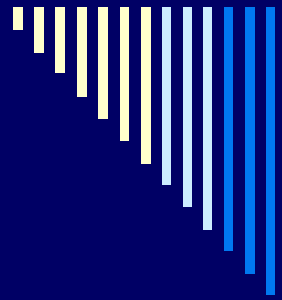
- Applied to EM needs, CIS data becomes critical safety data
- EM defines specific data quality objectives for CIS to meet emergency planning and response needs
- Convert objectives into quality standards and implement



6. Implement data-quality programs for EM use of CIS

Implementation

- Requires the application of expertise in data quality management to the CIS
- No best practices observed in evaluation



7. Information available to EM through user-generated reports

- Interactive design and generation of reports by emergency planners/responders
- Real-time use of CIS data during emergency response



7. Information available to EM through user-generated reports

Implementation

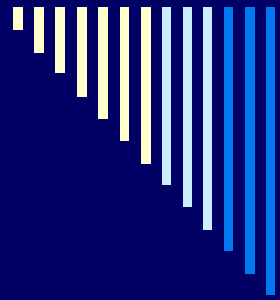
- Joint effort between CIS and EM to identify tools of value to EM
 - n Reports
 - n Data flags
 - n Automated notifications



7. Information available to EM through user-generated reports

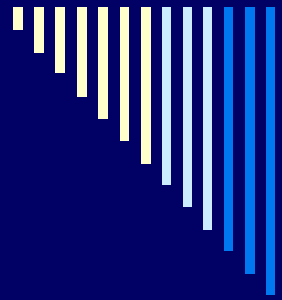
Best Practices

- Select few sites have user-controlled report generation capability
- Most sites can generate custom reports via CIS group



8. Automated notifications built in to CIS

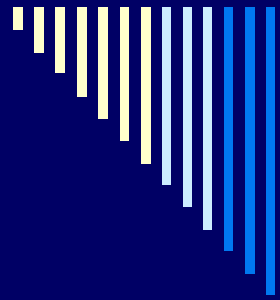
- Notifications on inventory changes that may prompt EM action
- Lifecycle hazard reduction
- Value to EM, ES&H, hazardous material owners



8. Automated notifications built in to CIS

Implementation

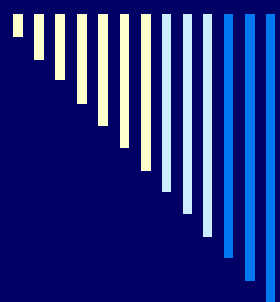
- Joint effort between CIS and EM to identify tools of value to EM
 - n Identify most valuable notifications
 - n Prioritize and implement via graded approach



8. Automated notifications built in to CIS

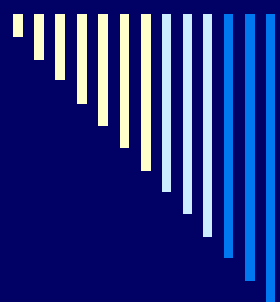
Best Practices

- In use at three sites
- Building managers and EM notified by e-mail when predetermined inventory limits are approached or exceeded



9. Integrated with other hazardous chemical tracking systems

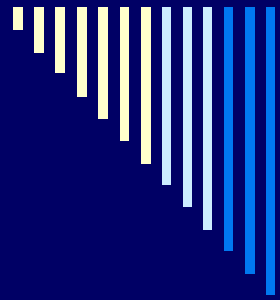
- CIS acquires/manipulates data from other systems
- Comprehensive accounting of chemicals
- Improves ability to comply with DOE O 151.1C
- Emergency planning/response efficiency



9. Integrated with other hazardous chemical tracking systems

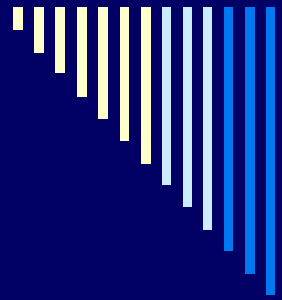
Implementation

- Collaborative data integration between CIS and other data system staff
- Integrate inventories from such sources as:
 - n Storage tanks
 - n Waste streams
 - n Pipelines



10. Develop formal training for CIS users

- Knowledge and skill-based training to drive effective use of database
- Improve data accuracy
- Greater independence for all users
- More efficient use by EM drives more efficiency into emergency planning and response



10. Develop formal training for CIS users

Implementation

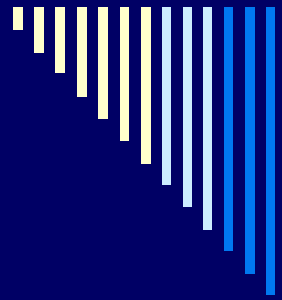
- Training designed by both CIS and EM
- Focus on needs of EM



10. Develop formal training for CIS users

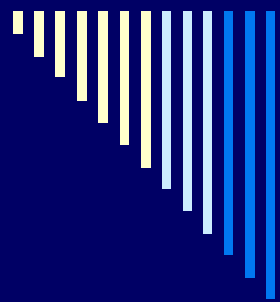
Best Practices

- Some level of user training at all sites
- Several sites have formalized training to produce qualified CIS users
- Users requalified as capabilities upgraded



11. Provides real-time access to up-to-date information

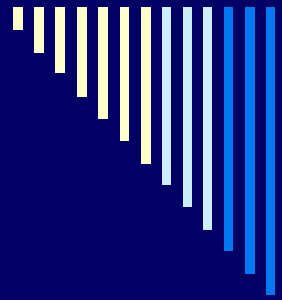
- EM and CIS staff jointly establish currency targets
- Emergency planning identifies when inventories will exceed predetermined limits
 - n Accurate definition of hazards level during emergency
 - n Rapid response
 - n Improved decision-making



11. Provides real-time access to up-to-date information

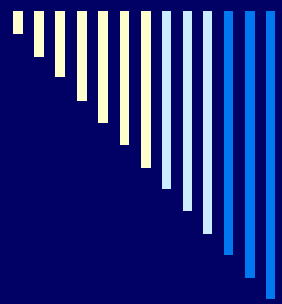
Implementation

- Integrating real-time access typically requires redesign of CIS
- Incorporate other key features, including:
 - n User-friendly interface
 - n Integration with procurement
 - n Links to MSDS



12. Captures and retains information on historical usage of hazardous materials

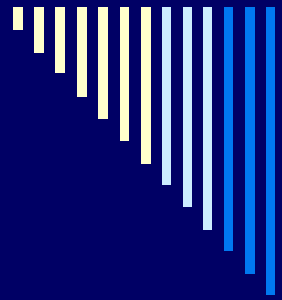
- Provide historical inventory information for trends analysis
- Emergency planning uses to establish realistic planning inventories



12. Captures and retains information on historical usage of hazardous materials

Implementation

- Probably requires a design modification to CIS
- Some systems have some capability



13. CIS used as tool to reduce or eliminate hazardous materials

- Evaluate risk for hazardous materials versus mission
 - n Cost
 - n Liability
 - n Hazards analyses – surveys, assessments



13. CIS used as tool to reduce or eliminate hazardous materials

Implementation

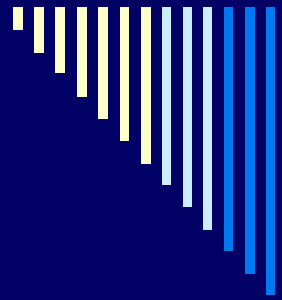
- CIS team and EM jointly identify materials of concern
- Work with facilities managers to reduce inventory where possible without jeopardizing facility mission



13. CIS used as tool to reduce or eliminate hazardous materials

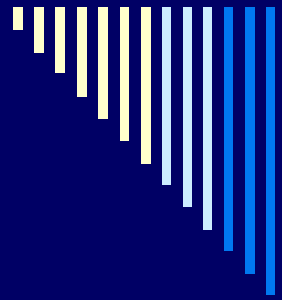
Best Practices

- A few sites have significantly reduced chemical inventories and chemical purchases. One site has been recognized as achieving outstanding success in this area.



14. Design is flexible and supports current & anticipated EM needs

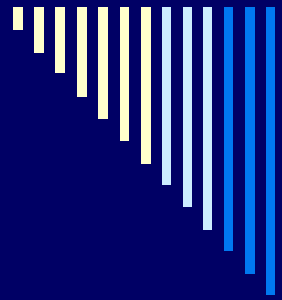
- Able to support rapid system modification in response to emerging EM needs



14. Design is flexible and supports current & anticipated EM needs

Implementation

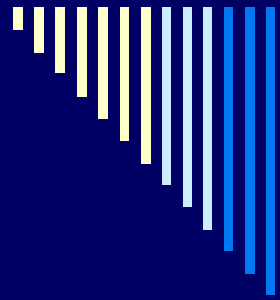
- Some systems have sufficient flexibility
- When changes are necessary, implementation can be very resource intensive



14. Design is flexible and supports current & anticipated EM needs

Best Practices

- Several sites are confident that their CIS architecture can accommodate new EM needs over the next five years



Overall Best Practices

- Automated notifications
- Hazards reduction programs
- Thresholds built into CIS
- Integrated management approach to EM and CIS management



Information Sharing among Sites

- EMI-SIG Subcommittee on Hazards Assessment
- EFCOG – Chemical Safety/Lifecycle Management
 - n Benefits of Lifecycle Management to EM
 - n Hazards Survey, EPHA results used to prioritize chemical lifecycle actions



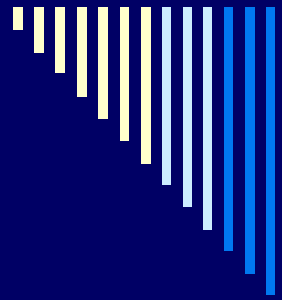
Path Forward for Individual Sites

- Conduct internal site survey
- Identify site-level gaps and needs
- Determine current status versus:
 - n CIS key features
 - n DOE requirements
 - n Best practices
- Develop prioritized list of site-appropriate actions
 - n Cost/time/resources
 - n Existing best practice
- Develop joint plan of action with CIS team



Conclusions

- Strong systems exist at a number of sites
- Good awareness of capabilities/limitations
- Strong commitment to meet EM needs among sites
- Real-time inventory management technology is promising but not ready



Questions