



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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March 2, 1998

MEMORANDUM TO: Carl J. Paperiello, Director
Office of Nuclear Material Safety
and Safeguards

FROM: Margaret V. Federline, Acting Director *M. V. Federline*
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

SUBJECT: ADVANCED COMPUTER SYSTEM INTERIM STATUS REPORT

The purpose of this memorandum is to advise you of steps taken by the Division of Waste Management (DWM) since September 1997, to increase the usage of the Advanced Computer System (ACS) and to decrease the total costs associated with ACS (i.e., acquisition of hardware and software, maintenance, and development). We plan to submit a separate memorandum to you in April 1998, on each of the action items DWM proposed in response to the Management Control Review of the ACS.

ACS Usage

The ACS staff has implemented a monitoring system that tracks the usage of ACS. The system provides useful information to computer systems administrators in identifying hardware requirements. However, it is time consuming to analyze the data and its use as a management tool for monitoring the number of users, and the amount of time used, is limited. The ACS staff is investigating alternative monitoring systems (e.g., WIRETAP and SERVER VISION). We will include recommendations about ACS usage monitoring in the April 1998 memorandum.

ACS Training

On January 23, 1998, DWM transmitted a memorandum to other Divisions in the Office of Nuclear Material Safety and Safeguards (NMSS) asking for information on ACS use and training needs. Fifty-eight training requests were identified in the response to our January 23 memorandum—36 from DWM, 19 from the Division of Fuel Cycle Safety and Safeguards (FCSS), and 3 from the Spent Fuel Project Office (SFPO).

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Based on this response, DWM developed a preliminary training plan to address ACS-related training requests from NMSS staff. A summary of the plan is presented below:

1. For Geographic Information Systems (GIS) training (which accounted for nearly 50 percent of our overall requests), designate an Office expert, with a backup, rather than undertaking expensive and time-consuming training for a large number of staffers (a contractor employee has been designated as the current expert, and a staff person will be identified to serve as the Office backup on these software products);
2. Ask the Professional Development Center to reschedule courses that it has provided in the past (applies to S-Plus);
3. Recommend approval of training for certain courses at local educational institutions (applies to C++, Mathematica, and FORTRAN);
4. Establish user groups for certain software products so that beginning users can obtain on-site guidance from experienced users about employing the various products in ACS (applies to Adobe products, Mathematica, MCNP, Monk-McBend, and S-Plus);
5. Initiate a process of placing general instructions on software product use on the ACS Home Page so that users will have written instructions on setting up each product (instructions are currently available for Monk-McBend and GNUPLOT, others will be added with subsequent ACS Home Page updates); and
6. Provide a specific area of the ACS Home Page where NMSS staff can request training in any of the software products supported by ACS, with all such requests being directed to the ACS Supervisor (the ACS supervisor will determine the appropriate training to be provided).

ACS Steering Board/Technology Advancement Board

The ACS Steering Board has been established and has met twice. The Board has not yet taken any substantive steps to improve the operations of ACS, but the Board meetings have been useful in identifying the computer needs of FCSS and SFPO [because of scheduling conflicts, the Office of Program Management Policy Development and Analysis Staff (PMDA) and the Division of Industrial and Medical Nuclear Safety have not yet been able to participate in the Board meetings].

DWM will seek reactivation of the Technology Advancement Board to assist the Steering Board in coordinating ACS capabilities with the computational capabilities of the Office of the Chief Information Officer (OCIO), the Office of Nuclear Reactor Regulation, and the Office of Nuclear Regulatory Research in developing a strategic plan for ACS. However, DWM considers that the reactivation should be postponed until the Steering Board has had the opportunity to resolve ACS issues.

Information Management (Consolidated Document System, Fuel Cycle Inspections, GIS, and Video Streaming)

FCSS staff have indicated a need for improved information management related to Fuel Cycle inspections. ACS staff are working with FCSS staff to determine if ACS can be used for this purpose.

Beginning in January 1998, ACS staff have given demonstrations of the Consolidated Document System (CDOCS) to individuals from DWM, PMDA, FCSS, and SFPO and received comments from the attendees. To date, 10 NMSS staff members have attended the demonstrations--70 percent of the attendees indicated that they would use the CDOCS system, while 30 percent of the attendees indicated they would not use the CDOCS system.

The ACS staff are working with OCIO staff to transport the CDOCS data base (or a relevant portion thereof) to the ADAMS system. With the possible exception of hyperlinks and images, no serious difficulties are anticipated for this transition.

Staff resources for CDOCS have been substantially reduced from an annual rate of about \$350K per year in CY 1997 to a present rate of about \$35K per year. DWM is considering whether further reductions can be made or whether CDOCS should in fact be retired.

On February 17, 1998, ACS staff gave a demonstration on the use of the Universal Server concept for NMSS information management applications (e.g., CDOCS, GIS, fuel cycle inspections, and video streaming). The ACS staff (with guidance from the ACS Steering Board) are evaluating whether to further investigate the concept.

GIS

The ACS purchased and installed Silicon Graphics (SGI) hardware necessary to run state-of-the-art 3D modeling [EarthVision (EV)] and GIS (ARC/INFO and ArcView) software. The hardware and software combined enabled ACS staff to initiate review of Version 2.0 of the U.S. Department of Energy (DOE) 3D Integrated Site Model (ISM2.0) of Yucca Mountain and prepare for review of the forthcoming next version, ISM3.0. The DOE ISM codes are 3D models of Yucca Mountain and are constructed with EV software to illustrate 44 faults, 37 stratigraphic units, and the following properties: porosity, hydraulic conductivity, and thermal conductivity.

ACS staff are also working with the Low-Level Waste and Decommissioning Projects Branch (LLDP) staff on using EV modeling software and SGI hardware, to analyze and illustrate in 3D, uranium concentrations in the Kiski Valley Sludge Lagoon. Pilot projects are currently being planned for the Uranium Recovery Branch (Sweetwater has been recommended) and LLDP (Sequoyah Fuels has been recommended) for which ACS staff will continue integrating GIS and 3D modeling applications.

Seminars on EV modeling and GIS applications were conducted for NRC staff on January 27-29, 1998, in the ACS laboratory. A total of 11 NRC staff attended. The seminars were geared to show the approach for walking directly from 2D GIS (geographic) data to illustration of 3D variations in property data. Real data from a site in Manassas, VA, showing distribution of chemical pollutants (pce) below the water table, were used to construct 3D contours (isosurfaces) representing the subsurface distribution of pce in a 3D block model. These data were chosen because they illustrate practical use of the EV modeling software for analysis and presentation of 3D variations in property values as they occur with depth in boreholes. The seminars generated considerable interest in the 3D modeling applications, and additional seminars are planned for at least four more NRC staff in the near future.

ACS Name Change

Consistent with your desire that the name of the ACS be changed to more accurately reflect how we are currently using the ACS, as well as the potential usefulness of it for other parts of NMSS, we recommend renaming it the "Computerized Risk Assessment and Data Analysis Lab" (CRADAL). Use of this name and acronym will await your approval.

cc: NMSS Division Directors
 NMSS Deputy Division Directors
 Steering Board Members
 C. Jones
 N. Eisenberg

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