



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

AUG 31 1988

MEMORANDUM FOR: Emily Robinson, Scientific/Program Analyst
Information and Technical Services Branch
Division of Automated Services

FROM: Joseph O. Bunting, Chief
Systems Engineering/CNWRA Branch
Division of High-Level Waste Management

SUBJECT: ARTICLE FOR FALL ISSUE OF ITS NEWS ENTITLED,
"NRC'S CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES"

Per your note dated July 29, 1988, enclosed is the subject article for inclusion in the Fall Issue of the ITS News. The document was prepared in accordance with the instructions specified in the note.

If you have any questions, or need further information, please contact me or Phil Altomare on extensions 23396 and 23400, respectively.

for Frances & David

Joseph O. Bunting, Chief
Systems Engineering/CNWRA Branch
Division of High-Level Waste Management
CNWRA Program Manager

Enclosures:
As Stated

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CNRA ITS ARTICLE

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for Andrea L. Hood

Joseph O. Bunting, Chief
 Systems Engineering/CNRA Branch
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 CNRA Program Manager

Enclosures:
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NRC's Center for Nuclear Waste Regulatory Analyses

On October 15, 1987, after completion of an intensely competitive procurement, the Nuclear Regulatory Commission (NRC) awarded a contract to the Southwest Research Institute to establish and operate the Center for Nuclear Waste Regulatory Analyses (the Center). The Center is an NRC sponsored Federally Funded Research and Development Center (FFRDC), created under the provisions of U. S. Office of Management and Budget (OMB) Office of Federal Procurement Policy Letter 84-1. The policy letter outlines the requirements of an FFRDC, the special relationship that is created between the FFRDC and its sponsor, and the responsibilities of the Government sponsor.

There are approximately 35 FFRDCs -- most are sponsored by the Department of Defense. NRC employees are more familiar with those sponsored by the U. S. Department of Energy -- the National Laboratories (e.g., Sandia, Oak Ridge, etc.). One of the common characteristics of all FFRDCs is that they are dedicated to support their Government sponsor and can only do work for other Government agencies as permitted by their sponsor. Another common characteristic is the limitation on the support that can be provided. Since the support is provided non-competitively, the scope of an FFRDC's activity is limited by its Charter. Thus the Center is dedicated solely to NRC, and its Charter limits its scope of activities to technical assistance and research in support of the High Level Waste Regulatory Program. The five year contract states NRC's intent to establish a long-term relationship (20+ years). Because the Center is an FFRDC, recompetition is not required for its contract to be renewed.

The Contract award culminated a three-year effort to solve the twin problems of freedom from conflict of interest and assurance of long-term continuity of NRC's technical assistance contractor support -- problems which jeopardized the high level waste program. Conflict of interest issues arise because many of our contractors, including the National Labs, were working both for us and for the applicant (DOE) simultaneously on the same program. Other contractors were abandoning us after years of developing expertise, at our expense, to compete for the larger DOE contracts. It would have been very difficult to achieve the improved assurances of long-term continuity and freedom from conflict of interests without the special relationship accorded to an FFRDC.

The Center's primary responsibility in the early years is to establish a center of technical excellence by attracting and retaining outstanding experts in the required disciplines. During this early phase, the Center is required to employ systems engineering and integration techniques to develop a "Program Architecture" (PA) for the complex regulatory program, which includes storage and transportation of high level waste, as well as its disposal in a repository. The PA is defined as the system description, and is derived by identification of each regulatory requirement, its elements of proof, its compliance demonstration method; and the analyses of these factors to identify any lack of certitude as to what is required by the regulation, what must be proven, or how it will be proven. It also includes

recommendations and implementation of NRC-approved uncertainty reduction methods, which are linked to each regulatory requirement. In addition, this linkage must also include schedules, resources and integrated networks. This preparatory work will help NRC identify and reduce potential regulatory and technical uncertainties which could jeopardize the Commission's ability to meet the statutory three-year time limit for a Commission decision (technical review and hearing) on the repository construction authorization.

The PA development will require a sophisticated computer information system to support the intensive research activity, to store and retrieve the voluminous information involved, to display the PA in a logical and understandable manner, and to facilitate timely responses and recommendations. The contract required the Center to develop and demonstrate a prototype within the first six months of the contract, which was successfully accomplished in April 1988.

The prototype employs standard IBM software packages on a shared IBM 4381-3 which includes: PROFS for general office automation (including Electronic Mail); DW 370 for report formatting; Application Systems (AS) for project control, networking, and resource analysis; SQL/QMF for formatted (relational) file queries; and CF-SEARCH when the documents are entered. This is all tied together by the Program Architecture Support System (PASS) developed by the Center. Consequently, going from one software package to another is transparent to the user, and automatic for report generation. One of the unique features of PASS is the use of "relational" databases. SQL/QMF employs relational tables that link records to one another on the basis of their content. Thus the staff can obtain a report on any specific regulatory requirement, listing its elements of proof, compliance determination method, technical and regulatory uncertainties, approved uncertainty reduction methods, their schedules and resources. The relationship of the activity within the regulatory network can also be displayed. The staff also has the ability to perform "what-if" analyses, to assess the impact to the regulatory program due to potential or actual cost, schedule and budgetary constraints.

With the outstanding support provided by the staff of the Office of Administration and Resource Management (ARM), Electronic Mail between White Flint and the Center's offices in San Antonio, Texas and Crystal City, Va. has already begun. ARM has also provided to the staffs of both the Center and NRC access to the ever growing full text storage and retrieval capabilities of the NRC Transitional Licensing Support System. ARM has also provided training to staffs of the Center and the NRC program office to enable them to fully utilize these advanced capabilities.

A limited number of NRC staff has access to PASS on a read-only basis. More extensive access is planned for the Spring of 1989. Implementation of system baseline configuration control is planned for Fall of 1989. The Center has conducted and published the results of a Critical Peer Review of the PASS, including the ability to meet schedules. The review was conducted by Mr. Charles Acree, who, while with the

CIA, gained exceptional experience in relational databases. Mr. Acree concludes "because the PA is an evolving, developing process itself, without precedent, and because a large computerized system has never before been used in the licensing process, it is perfectly understandable that a full explication of the PASS deliverable remains to be accomplished." Mr. Acree also concluded that the potential difficulty in meeting the milestones this Fall "does not lie in the area of PASS software development, but in the loading of requisite data ... in the Relational Data Base." We fully recognize this to be a very ambitious undertaking. Based on the demonstration of the computer capabilities to date, we also agree that the degree of success of PASS is limited to the ability of the Center's technical staff to conduct the complex analyses and research which will generate the data to load the extensive databases.

by Joe Bunting