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## IRM Looks to the Future

The Office of Information Resources Management (IRM) has a goal to improve communications and the services that are provided to the NRC. IRM is taking steps to ensure success in this area by expanding and initiating programs. In the Fall 1990 issue of the ITS News, three articles were presented about obtaining IRM services. In this issue, we are again presenting three articles about IRM's programs and steps to improve customer services. IRM's goal is to provide quality services and to keep the NRC customers informed.



## Vision '96: A Plan for the Future

By R. Stephen Scott, IRM

You may hear two new phrases being used around the NRC these days, and they both are significant to anyone who works in Information Resources Management (IRM) or uses any of IRM's services -- just about everyone at NRC! Those phrases are "IRM Vision '96" and "Total Quality Management," commonly referred to as TQM. These two phrases, while not synonymous, are closely linked, and it's important to know what they mean.

TQM is now in use throughout the Federal government as a strategic, integrated management system for achieving quality results. It involves both management and employees, and uses quantitative methods to measure progress. The goal of TQM

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is to ensure that an organization is doing the right thing at the right time in the production and delivery of products and services. TQM is a process that looks at the services needed to meet customer requirements, reaches a consensus on the meaning of quality, and develops a strategy for achieving a total quality organization. The concept establishes methods for making continuous process improvements, identifies the factors that may influence or inhibit an organization's capability to do quality work, and finds ways to deal with those forces.

In April 1990, Joyce Amenta, then Director of IRM, began a modified version of TQM for NRC's IRM program. To make the process as objective and productive as possible,

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an independent TQM facilitator, James Tate, Chief, TQM, Defense Communications Agency, came in to guide participants through its several stages. Mr. Tate began with a series of interviews with IRM managers and staff, IRM customers in other offices, and other agency managers. The information-gathering interviews were designed to understand NRC employees' current perceptions of the IRM mission, their positive and negative comments on IRM's performance of that mission, and their expectations of the IRM program five years from now. The information gained from the interviews and the findings of a random, agency-wide IRM employee

opinion survey provided a basis for discussion at an off-site IRM planning meeting.

A consistent theme that emerged from the off-site meeting, which was attended by IRM managers and representatives of customer offices, including ADM, SECY, AEOD, NRR, NMSS, and RES, was the need for a partnership between IRM and the offices that it serves. Customers must be allowed and encouraged to play a more active role in defining IRM requirements and strategies, and IRM must do a better job of involving the customers in its planning process. The participants agreed on: (1) a purpose statement for IRM--to provide quality management of NRC information resources and to assist customers in accomplishing their functions efficiently and effectively through the use of information technology and services; (2) an IRM mission statement--to plan, develop, implement, and manage NRC information systems; to provide service and support for customer requirements; and to guide the NRC toward the use and integration of appropriate technologies to enhance the accomplishment of the NRC mission; and (3) a statement of IRM's goal five years from now -- "IRM Vision '96" -- and the major focus areas requiring actions to achieve that goal.

IRM Vision '96 is a working plan to ensure that five years from now IRM will be the recognized leader and manager of information technology at NRC, providing integrated support and delivering quality products and services in partnership with its customers. The major focus areas that will contribute to, or inhibit, success in achieving that goal include, planning, resources, customer/supplier relations, technology management, and human relations.

Following up on the directions charted at the off-site meeting in June 1990, the new Acting Director for IRM, Patricia G. Norry, requested the assistance of other NRC offices in identifying the specific

actions required to implement IRM Vision '96. Major Focus Area Working Groups were formed to chart action plans and schedules, with an emphasis on immediately beneficial actions. As a result of these efforts, an IRM Vision '96 Action Plan has been developed and presented to the Executive Director for Operations. It includes more than fifty specific tasks that have been or will be undertaken over the next five years. For example, in the area of planning, an IRM Strategic Advisory Board has been proposed to provide a forum for senior management to develop IRM priorities and to build agency-wide commitment to IRM policies and strategies. In the area of resources, a new approach to the IRM Planning Call fosters feedback from the program offices, while the area of technology management focuses on development of a long-range strategy for the agency's computing environment. The area of customer/supplier relations stresses actions to improve IRM project management, while in the human relations area, actions to involve employees in planning, training opportunities, and enhanced recognition for contributions to the IRM mission will promote teamwork and self-esteem.

IRM plans to continue to involve customer offices in Vision '96, and is establishing the mechanisms to measure progress toward achieving Vision '96. Specific actions will be taken only as resources permit, but it appears that much can be done to move IRM toward TQM. For example, by the time this article is published, the following should be evident: a greater awareness of IRM Vision '96 throughout the agency, the designation of a single project manager for each major IRM project, the publication of an "IRM Customer Services Directory", progress toward a long-range computing strategy, a new sense of teamwork in IRM, and an emphasis on planning in partnership with customer offices. If you have any questions concerning information in this article, please call Steve Scott on 492-8585.

#### Special Thanks!

The ITS NEWS Staff wishes to give special thanks to Sharon Root, IRM. She has been the Interim Editor of the ITS NEWS for the previous and current issues while the Editor was assigned to a special project. Sharon stepped in and did an excellent job. We appreciate her dedication and hard work. Thanks Sharon!

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## IRM Survey Results Analyzed

By R. Stephen Scott, IRM

During 1990, the Office of Information Resources Management (IRM) conducted an employee opinion survey to determine whether IRM is making NRC employees aware of the services IRM provides; whether those services are adequate to meet the agency's needs; whether the services are being used; and how the services could be improved. More than half of those surveyed responded, and from more than 300 responses, IRM has gained some insight into how well its customers think IRM is serving them.

The analysis of the survey responses was performed by Automated Management Consultants, Inc., (AMCI), of Rockville, MD, and indicated that most IRM services are perceived as satisfactory. Some excel while others fall short of NRC staff expectations. With the exception of the Office of Nuclear Reactor Regulation, NRC employees do not feel that IRM's policies are delaying or negatively affecting their work. More than half of the employees surveyed in NRR felt that IRM policies were hampering their efforts, but no single reason appeared to predominate.

In general, the survey results indicated that NRC staff are not aware that many of the services they use are provided by IRM. Most people knew that IRM provided PCs and computer support, but were not aware that IRM also provides courier services. There was little awareness of any IRM planning for the agency's future requirements, and there was some disappointment with IRM because the Office is viewed as lacking the resources to adequately support the diverse agency inventory of computer hardware and software.

While in many areas respondents gave IRM a rating equivalent to a B plus or an A minus, there were some areas where NRC's employees felt

services could be better. Staff are not satisfied with either the timeliness or process of getting PCs or software. More than one third of those responding were not satisfied with the way their requests for hardware or software were handled; more than 50 percent said they did not use the IRM user assistance support line; and 30 percent would call a friend if they needed help with an application.

In other areas, staff in the regional offices want more training, and while satisfied with ITS training, NRC employees feel the ITS Training Laboratory needs to be better equipped. Staff in the White Flint building feel that more library services are needed there, and, while almost 90 percent of those responding felt that the telephone directory provided useful and timely information, more than forty individual comments were offered on how to improve it.

The final analysis of the survey (almost six inches thick) contains breakouts by offices, employee category, grade levels, etc., and covers more findings than are dealt with in this article. Additionally, IRM asked the consultant, AMCI, to offer solutions based on their experience with surveys in other agencies and companies. Briefly, AMCI suggested that IRM should do a better job of getting its message out to the agency, that IRM is probably stretched too thin to meet all demands, and that IRM is trying to support too many different types of computer environments.

IRM has used this survey analysis in two ways. First, it was used during IRM's Total Quality Management (TQM) initiative to provide a perspective on how well NRC staff felt IRM was performing. Based on this information, and other views gathered through interviews, IRM's managers were able to develop a TQM strategy and identify specific actions that will be needed if IRM is to achieve its Vision '96 goal that in the next five years IRM will become the recognized leader and manager

of information technology, providing integrated support and delivering quality products and services in partnership with its customers. Second, IRM has initiated several actions that more immediately address some of the concerns the survey reflected. For example,

- IRM has established a liaison program with the Division of Contracts and Property Management (DCPM) to improve the procurement of computer equipment and IRM services. Branch Chiefs and above from IRM and DCPM meet quarterly, and DCPM staff attend meetings between IRM and office ADP Coordinators.

### Correction To Article in Fall 1990 Issue

*The first paragraph of the article entitled, "Selecting the Best Co-Processor," by Ralph Landry, RES, had text inadvertently omitted. We apologize for the error. The first paragraph should read as follows:*

Several members of the NRC's Research staff received i386 based-computers, or have obtained approval for the order, and are now considering ways to increase the calculational speed of the system. Some immediately think of adding a math co-processor, or Floating Point Unit (FPU). A co-processor is a valuable addition where applications make extensive use of floating point (decimal) arithmetic. Examples of software that can utilize the co-processor are scientific codes, graphics and some spreadsheet programs. Examples of software then that cannot utilize the co-processor are word processing, database management, and telecommunications programs. Simple solution, assure that the software you plan on running can use the FPU. But, did you know that all FPUs are not created equal?



- IRM is revising the "IRM Customer Services Directory", expanding its coverage and availability, and is considering making it a part of an "Integrated Services Guide." The Guide will describe how to obtain IRM services and explain the roles of IRM, its suppliers, and its customers. In addition, the Fall 1990 edition of the ITS News focused on the methods of obtaining micro and computer hardware, software, and telecommunications services.
- IRM staff visited each Region to review how mail and distribution requirements are handled.
- Two different IRM help lines were combined to eliminate confusion for callers.
- Library services at the White Flint Reading Room were expanded and now include access to industry codes on CD-ROM.
- The IRM Liaison Program now includes office ADP Coordinators in its quarterly meetings to better identify continuing problems and areas for improvement.
- A new approach is making it quicker and somewhat easier to procure PCs.
- A PC Status Report is helping offices keep better track of their hardware and software acquisitions.
- The planned equipment upgrade of the ITS Training Laboratory has been implemented.

IRM appreciates the cooperation of all NRC employees who responded to the opinion survey. Anyone who would like to read the survey analysis and findings may do so at the NRC Library during the month of March 1991.

If you have any questions concerning this article, please call Steve Scott on 492-8585.

## IRM's Liaison Program Strengthened

By R. Stephen Scott, IRM

The Information Resources Management (IRM) Liaison Program was first established at the Nuclear Regulatory Commission in June 1988 to provide an IRM staff member to work directly with each NRC office to resolve daily problems, ensure continuous service, plan for changes in service requirements, and anticipate new requirements on an ongoing basis. In January 1990, based on experience with the program, IRM took several steps to strengthen the Liaison Program and make it more responsive. A charter was established to provide a framework for the Liaison's functions; make it clear that Liaisons have the attention and support of IRM management; establish a central point within IRM

to coordinate the program; and establish procedures to guide the Liaisons' activities. Where necessary, new Liaisons were assigned to ensure that each office receives an appropriate level of attention. During 1990, for the first time, Liaisons helped compile the IRM Planning Call. Now, with the added focus of IRM's Vision '96, the IRM Liaison Program will play an important part in helping IRM attain its Total Quality Management objectives by fostering a sense of partnership with IRM's customer offices.

### How It Works

The IRM Liaison Program is not intended to replace established channels of support and communications between IRM and its customers, but rather to provide each office with a knowledgeable representative to assist program offices in obtaining support from IRM when routine channels are not

Office	ADP Coordinator	Liaison
ACRS	Stan Schofer	Steve Scott
ADM	Larry Cooper	John Burton
AEOD	Gina Thompson	Dick Hartfield
ASLBP	Elva Leins	Garrie Williams
CON	George Mathews	Tom Sheffler
EDO	Pat Larkins	Fran Goldberg
GPA	Fiona Solander	Rashida Alam
LSSA	Marlene Crigger	Kim Basile
NMSS	Sally Cornell	Bill Usilton
NRR	Elliott Greher	Steve Scott
OC	Lars Solander	John Sullivan
OCM		Guy Wright
OE	Dick Rosano	Emily Robinson
OGC	Nancy Dube	Rashida Alam
OI	Betsy Barber	Emily Robinson
OIG	Mona Hicks	Lou Grosman
OP	Nick Monaco	Judy Seeherman
RES	Sheri Hichar	Clarice Nizer
SDBU/CR	Jorge Mestre	Tom Sheffler
SECY	Sandra Showman	Steve Scott
Region I	Robert Gross	Steve Scott
Region II	Jeff Lankford	Steve Scott
Region III	Marty Kerlin	Steve Scott
Region IV	Jayallen Rettig	Steve Scott
Region V	Terry McNally	Steve Scott

responsive, known, or existent; to provide IRM management with an early "heads up" on problems, developments, or changing priorities in a program office; and to improve communications, awareness, responsiveness, and support for both the customer and IRM managers.

IRM Liaisons work with their counterparts in the program offices, (i.e., the ADP Coordinators), to develop and maintain an understanding and working knowledge of the information requirements for that office. They meet regularly with the office ADP Coordinator and communicate to the IRM management chain any problems, concerns, suggestions, etc. that they gather through such interactions. Likewise, they keep their assigned offices informed of any developments or issues that may affect the office. Many Liaisons have become members of office ADP User Groups.

When particular items are identified for discussion at meetings with the program office, the Liaison and the ADP Coordinator develop an agenda. The Liaison is responsible for ensuring that the right people from IRM attend meetings, and also informs the Division of Contract and Property Management of the agenda. Within IRM, efforts are made to inform the Liaisons on matters that may affect the office to which he/she is assigned, and, in several cases, the program office routinely places the Liaison on the list for correspondence and information related to IRM. Once again this year, the Liaisons will be actively involved in the IRM Planning Call.

### **New Directions**

IRM management meets quarterly with the Liaisons to discuss the effectiveness of the program and exchange views on program improvements. IRM took advantage of the most recent quarterly meeting to move in the direction of Visia '96 by inviting all office ADP Coordinators to participate. Mrs. Patricia G. Norry, Acting

Director, IRM, took this opportunity to stress how important she believes the Liaisons and Coordinators are to building the sense of partnership that IRM feels is essential for the achievement of Total Quality Management objectives. Future quarterly meetings will focus on specific areas for review and discussion, and will involve representatives from the Division of Contracts and Property Management.

### **Partners in Quality**

Listed on the previous page by office are the ADP Coordinators and IRM Liaisons.

The IRM Liaison Program Coordinator is Steve Scott, Mail Stop MNBB 6219. If you have any questions about this article, please call Steve Scott on 492-8585.

## **IRM Announces Arrival of the Data General MV40000 Minicomputer**

*By Jim Blanton, IRM*

Two years ago, the Nuclear Documents System (NUDOCS), a hierarchical database system, was running on a Data General MV/10000. At that time, the search features of the system were limited to twelve (12) boolean or "canned" searches which afforded limited flexibility in the development of search strategy.

In response to needs expressed by the staff for a more powerful tool for their use, IRM developed the Nuclear Documents System/Advanced Design (NUDOCS/AD), a relational database system. The new system provides enhanced capabilities. These capabilities include more flexible search strategy development, browse features, the ability to search for a given term, full text, and data download capabilities. NUDOCS/AD enhancements required significantly more comput-

ing power than did NUDOCS. On an interim basis, NUDOCS/AD has been running on an intermediate computer, the Data General MV/20000. Although NUDOCS/AD is running on the MV/20000, it is not operating up to its full capabilities.

In order to implement various enhancements to the Nuclear Documents System (NUDOCS), the Office of Information Resources Management began the procurement of a Data General MV/40000, the larger more powerful minicomputer for which the NUDOCS/AD system was designed. This machine offers more speed in performing document searches and retrieval, and offers more access ports for user connection to the system.

The Data General MV/40000 has arrived and has been installed in the Phillips Building Computer Facility. The transfer of the NUDOCS/AD database and all of the applications software from the MV/20000 to the MV/40000 has begun. Once the NUDOCS/AD system is transferred and tested to assure that all functions are working as expected, access will be provided to the NRC user community. In addition to the implementation of the various enhancements, such as the "canned searches" (the 12 boolean searches which were present in the old system) capabilities, and an increase in the number of access ports, the user community will notice significant improvements in computer response time.

Users will be notified when NUDOCS/AD is installed on the MV/40000 and will be given the opportunity to test and become familiar with the application before it is implemented in production.

If you have any questions concerning this article, please call Jim Blanton on 492-4570.

**Computer Problems?**

**Call ITS Support**

**492-0353**

# High Performance Computing with UNIX

By Neil Thompson, NRR

## Industry Move to Open Systems

Many computer industry leaders believe that different makes of computers should be basically compatible; that all computers should conform to certain broad standards; and that competition should be based on special options and price, not secrecy and proprietary considerations. They also believe that open architecture will accelerate the progress of computer science and that secrecy and proprietary considerations are self-defeating. IBM recently announced its entry into the high-performance UNIX workstation market, after conceding that the marketplace demanded low-cost, high-performance computing. IBM, with its recent unveiling of the Reduced Instruction Set Computer (RISC) System/6000 "POWERstations" has matched and exceeded the speed and performance of its competitors. Sun and Hewlett Packard are almost tied for market leadership, 28 and 26 percent, respectively. Digital follows close behind with 20 percent of trade and IBM barely with 2 percent.

## UNIX PC to Supercomputer

UNIX is an operating system (OS), the master program that enables a computer to handle other programs. It has gained wide acceptance in science, engineering, and computer visualization. Attractions of this OS are manifold, including the ability to operate on a variety of machines, ranging from PCs to supercomputers.

Sun workstations use SunOS (Sun UNIX Operating System); a merge of AT&T's (American Telephone & Telegraph) UNIX System V and 4.3/4.2 BSD (Berkeley System Development). Today UNIX is often the preferred operating system of scientists, engineers, and designers who require high-performance computing for analysis and imagery. Over a hundred different computer

manufacturers now offer UNIX-based systems, from personal computers to supercomputers. The major features and benefits of UNIX are portability, portable applications software, multiuser operations, background processing, hierarchical file system, utilities, text processing, and software development tools. One of its major disadvantages is high system overhead (storage and other system resource requirements) which has limited its use on low end machines. National DOE Laboratories are turning to UNIX as the primary system for their supercomputing and enhancing their high performance with hundreds of UNIX based workstations (e.g., Los Alamos' six CRAY computers to be UNIX based by August 1991).

## UNIX at the NRC

The UNIX operating system is relatively new to NRC. In 1987, IRM purchased NRC's first UNIX-based Sun-3/50 workstation and local area network (LAN) for the Automated Graphics Section. In 1988, ADM followed this precedent and purchased a similar UNIX-based electronic publishing system. In 1989, RES, in coordination with the Division of Engineering Technology (DET), NRR, purchased its first UNIX-based Sun-4/260 workstation to increase its ability to analyze data from the National Seismographic Network (NSN) established in cooperation with the U.S. Geological Survey (USGS). DET's workstation provides this capacity and avoids the costs and complications of using mainframe computers at the NIH and other locations. NRR is presently acquiring programs for processing seismic data from the NSN.

Presently, DET and the Division of Systems Technology (DST) are installing a UNIX-based LAN:

- A Sun386i UNIX/DOS high-performance computer workstation

based on a 32-bit, Intel 33 MHz 80386 central processing unit (CPU) which delivers 5-MIPS (million instructions per second) integer performance.

- A UNIX-based Sun-4/260 high-performance workstation, (10-MIPS performance) based on a 32-bit, RISC microprocessor architecture.
- In FY91, DET will add a Sun SPARCstation (scalable processor architecture) 1+ desktop workstation, (15.8 MIPS performance).

These workstations will be used to access memory-intensive codes, programs, and imagery, including engineering finite element analysis (FEA) and high-resolution images used with Geographic Information Systems (GIS), computer-aided design and engineering systems (CAD/CAE). These workstations will provide NRR's staff with the power to rapidly analyze, visualize, and consolidate information.

## Future Capabilities

The UNIX operating system will provide the staff with multi-user (ETHERNET connectivity and high-performance resource-sharing); multi-tasking (with multiple independent, windowed computer displays on a single monitor); and visual access to distributed network computing that the DOS environment does not provide (via bit-mapped high-resolution 19 inch color graphics display monitor, 1152 horizontal x 900 vertical pixel display resolution, 81 pixels per inch, 8 bits per pixel, 66 Hz refresh rate). UNIX high-performance color workstations technologies provide access to powerful visualization techniques for scientific engineering and CAD applications, visual design, analysis, synthesis, and connectivity. They are only the beginning of what this decade will offer the NRC in advanced com-



puter technologies, understanding and improved communication being the net result.

DET and DST will link their DOS-based PCs with this UNIX LAN, allowing DOS users to share information and resources with high-performance workstations, minicomputers, and super-minicomputers otherwise restricted to UNIX users. Also in the plan is to link these systems with the Automated Graphics Section, RES, the Incident Response Center, and NMSS to share existing files and to collaborate on visual analysis, GIS, CAD, and distributed resource computing. Networking is planned to share information exchange with other agencies, national laboratories, and utilities.

DET will work with other Federal agencies, such as the Center for Seismic Studies (CCSS), to demonstrate how maps, photos, drawings, diagrams, charts, and realtime process indicators improve communications and decision-making based on parallel processing of information and imagery. Other federal agencies, such as U.S. Geological Survey, Department of Energy, Defense Nuclear Facility Board, the Federal Emergency Management Agency, and possibly the Defense Nuclear Agency can be linked to NRC's UNIX workstations for the information exchange and the electronic review of future applications.

### Communications and Super-visualization

The use of UNIX-based computer workstations within NRR and NRC will develop and expand as communications and computer technologies emerge and refine. The current plan is to use more visualization techniques and software to communicate scientific and engineering information to improve communications and comprehension of complete data.

The future is now! With high-performance UNIX workstations within NRR, the staff will eventually

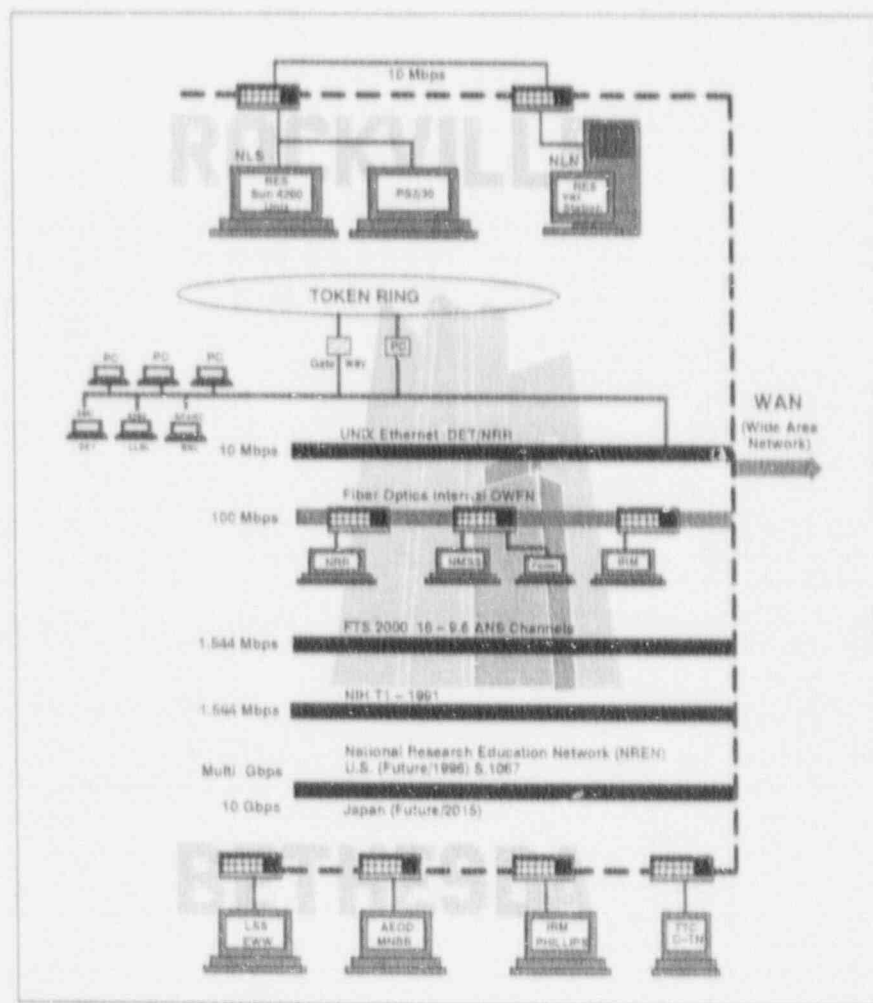
have connectivity to each other and to nationwide communication networks to view computer models in realtime as video sequence. Multi-gigabit transmission capabilities proposed by Congress are to be installed by 1996 (Senate Bill S.1067), which further demonstrates the need for NRC to increase its access to high-performance computing resources and nationwide networks. The FTS 2000 T-1 lines (1.544 Mbps, rate of speed) are expected to be available at White Flint in the near future for ANS (16-18 channels, 9.6 KBPS/54 KBPS Autodialing Network System). The staff intends to take advantage of this capability.

Eventually, UNIX high-performance desktop computing will be used to link national and international, scientific, engineering, and regula-

tory information needs. NRC's communications, decision-making and productivity will be enhanced as a result.

NRC currently has 15 token ring local area networks with 600 workstations. Seven of these networks are linked together so that over 400 NRC staff are currently connected and can share information. These networks are designed primarily for administrative purposes such as word processing, electronic mail, and workload tracking.

This article discusses another type of computer network designed to support the scientific and engineering applications of NRC. An ad hoc "High Performance Computer Systems" users' group met on November 14, 1990 to discuss



Future communication links for high-performance computing at NRC.

experiences, problems and recommendations for the NRC's future in UNIX based computing. The group noted that the use of UNIX within the NRC is very limited. Currently, there are three engineering workstations, a Sun 4/260 (Research), a Sun 386i (NRR) and a Sun 3/50 (IRM). At the present time, the diverse equipment and applications show the wide capabilities of the system, but prevent establishing a uniform base of operation. The group also noted that the current networking at NRC does not include the high grade communications link needed for connections of the distributed UNIX-based equipment now in-house.

if you have any questions concerning information in this article, please call Neil Thompson on 492-0735.

## Networking Insights

By Ralph Landry, RES and Neil Thompson, NRR

### Background

The Personal Computer (PC) era began a decade ago with the Apple and IBM microcomputers. The machines in the early days had small memories, used floppy disks for storage and, relatively speaking, were slow. Systems quickly developed to include hard disk drives (the C: drive), math co-processors, large Random Access Memory (RAM) and faster and faster central processing units (CPUs). Personal Computers radically improved individual productivity. Within the past decade the PC has become a viable rival for the mainframe computer. It was during this period that Complex Instruction Set Computing (CISC), used with both PCs and mainframe CPUs, was challenged by the new Reduced Instruction Set Computing (RISC) chip technology. Although not initially recognized as a technology that would soon become a standard, RISC is now the high performance computer technology of the engineering workstation.

As the size and speed of computing technologies developed for the PC and the workstation, equipment costs dropped dramatically.

Software developers took ever greater advantage of the hardware advances and developed programs that were larger, more memory intensive. These programs included integrated graphic user and window interfaces, scientific and engineering analysis, and advanced visualization technologies. A direct result of this development has been the need to share resources: programs, data, graphics and computer-aided imagery. The improved productivity of the individual that has resulted has brought about an opportunity and need to improve the productivity of groups, departments, and organizations. Increasing interaction, interpersonal computing and effortless networking have thus become important goals and objectives for businesses and government.

Computer peripheral equipment developers responded by developing modems so PCs, workstations, mainframes, and supercomputers could communicate over telephone lines. These were slow (1200 bps, 2400 bps, and 9600 bps; or bits per second), so the need for faster data transfer was answered by dedicated fixed wire links called networks.

Network communication rates have improved from 19.2 Kbps, 56 Kbps, and 64 Kbps (Kilo, or thousand, bits per second). Continuous developments in both hardware and software have created the need for even higher transmission rates. Current transmission rates for high performance computer networking environments include mega (million) and giga (billion) bits per second: (1) 1.544 Mbps and 44.736 Mbps T-1 and T-3 lines, respectively, (2) the Fiber Distributed Data Interface (FDDI), an ANSI standard for fiber optic data transmission at 150 Mbps, and (3) Multi-Gbps high capacity fiber optic networks.

Networks of computers quickly adapted to sharing resources,

programs, data, computing power/performance, and peripheral devices, such as, printers, plotters, and scanners, while simultaneously developing security methods and administrative controls to limit access. Today there are numerous ways in which computers, whether PCs, workstations, mainframes or super-computers can be networked with various levels of security.

The NRC has been cautiously adopting network technology. Networks are being gradually installed in each of the NRC offices. However, until high-performance computing and human-to-machine interaction is recognized as fundamental to the NRC's ability to work more productively, these networks will remain personal vs interpersonal regulatory computing environments.

### Network Methods

One year ago the PC LAN interface market was dominated by four technologies: Ethernet, Local Talk, Token Ring and Arcnet. Current revenue trends are anticipated to peak in 1991 when International Data Corporation (IDC) expects that the PC LAN market will become increasingly a commodity market. Margins will begin to erode and companies which rely primarily on hardware sales for revenue will face a period of little or no growth. Ethernet and Token Ring have emerged as the two dominant LAN technologies with 87% of all PC LAN interface shipments, worldwide, according to IDC. These two access methods were designed by specific companies and have, through widespread usage, become de facto standards. The architecture chosen for the NRC is the Token Ring although both technologies are being used by NRC staff. Ethernet local area networks will continue to grow in the 1990s at the NRC, which will require these two diverse network types to be interfaced for common resource sharing needs and for creating a computing environment for increased interaction and group productivity.



The Token Ring and Ethernet systems differ in how data are sent, how the PCs are wired together, and how the PCs take turns in talking over the network.

The Ethernet design requires each computer to monitor the link, and when it is quiet, send the data. Any computer can communicate with any other computer connected to the line. This is a major advantage of Ethernet which encourages interpersonal computing. One computer can use the hard drive of another computer for data storage if it needs more room. The system operates something like the old style telephone party line.

The Token Ring system uses sequenced token passing by the computers on the system. Only the central file server and the sending computer hear the transmission. Individual computers can send messages to each other via the file server, but they can not access each other's files or hardware. This is the major difference between Token Ring and Ethernet systems and limits the concept and use of interpersonal computing.

Interfacing these two network types can create a tool that can revolutionize the way the NRC works. Workstations on Ethernet and PCs on Token Ring can provide the NRC with the communications tools to become more productive, managerially, administratively, and technically. Networking to make interaction effortless is the goal. NRC computing will have to offer an E-mail system more advanced than anything we've used before. NRC computing will have to support true multi-tasking, so people can work naturally, doing several things at once. NRC computing will have to be perfectly intuitive; even first-time computer users should be able to sit down and put it to work. This high-performance computing environment has to be created at the NRC with these goals in mind; otherwise it will never be achieved. NRC will be left behind unless it takes prompt action

early in the 1990s to take advantage of these technologies; it is affordable today.

### Looking to the Future

NRC is now gradually approaching computer networking technology. Senator Gore (D-TN) introduced S. 1067, "To provide for a coordinated Federal research program to ensure continued United States leadership in high-performance computing." The resolution is to be known as the "National High-Performance Computer Technology Act of 1990." One of the specifications of the Act is to develop a national high-performance computer network, linking the federal government agencies, by the middle of the decade. How will the NRC respond should this become law? How should the NRC respond to the evidence provided in the Senate hearings regarding the nation's need for high-performance computing...wait and see?...or take action to plan and coordinate the use of these emerging technologies.

Where will we go in the future? This is a difficult question to answer. It will definitely be a challenge to the agency. Technology exists today to provide the NRC with high-performance computing and networking. The governmental upgrade to the T1 telephone lines is intended to provide clean, high-speed lines for computer communication. At the present, the plan of the telecommunications branch is to only install partial T1 service. The service that will not be installed is the high-speed communication capability. That severely limits the networking and communication links that are needed while we are dispersed in the Rockville-Bethesda area. It also means we can not have easy access to the nationwide Internet and ESnet-91 systems linking our laboratories, the universities, and other government agencies.

### Conclusions

The NRC is standing at the threshold of the high-performance com-

puting age. We have begun to implement the technology that will take the United States into the twenty-first century. Much still needs to be done if we, who regulate a high-tech industry, are to have the tools necessary to do a viable job in the future.

The NRC has a responsibility to use state-of-the-art technologies to assure that the regulatory issues of public health and safety are being efficiently addressed. Our neighbors to the north (AECL and AECB) are in the process of establishing high performance computer links to carry out that responsibility in Canada.

If you have any questions concerning this article, please call Ralph Landry on 492-3562 or Neil Thompson on 492-0735.

## A New Users' Group Formed -- UNIX!

By Ralph Landry, RES

The high performance computer systems (UNIX) users' group held its first meeting on November 14, 1990. The group is composed of those individuals who are, or will be, using UNIX operating-system-based computers within the NRC, and includes NRC staff from AEOD, IRM, NMSS, NRR, RES, and the Technical Training Center. At this formative meeting, the group discussed experience, problems, potential applications, and possible recommendations for the NRC's future in UNIX-based computing.

At the present time, diverse equipment and applications show the wide capabilities of the UNIX system, but indicate the need for a unifying method of operation. The group noted that existing connectivity plans for the NRC do not include the high-grade communications links needed for connection of the distributed UNIX based equipment now in place or likely to be established within the next year or two. The installation of T-1 telecommu-

...ion lines would offer high quality, high speed capability if the full T-1 system is used. The group recommends use of the full T-1 capabilities for computer communication.

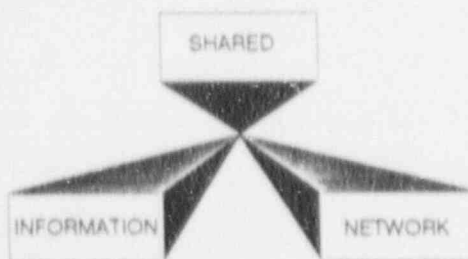
The group concluded that guidelines should be established to provide a consistent hardware and software base within the agency. These guidelines should not lock the agency into a particular hardware platform vendor, or exclude specific applications that may demand special hardware/software combinations. A suggested set of interim, general specifications for UNIX applications which are on the low

end of UNIX system performance and for which there are no special requirements is as follows: Sun SPARC compatible and compliant hardware running the Sun OS/4 or higher operating system and using the MIT X.11 Window graphical interface. With more experience, decisions based on further research and resulting knowledge can be made.

There is some justification for these generic, interim specifications. The hardware base and operating systems have been handled in a proprietary manner, so far. Codes running on one system have not always been easy to port to another

system. Sun has opened the SPARC technology through clone licensing agreements. At present, eleven vendors have developed SPARC system clones. An international group, SPARC International, has been formed by vendors of hardware, operating systems, and software. These factors indicate that the SPARC system will have a broad base of suppliers while using a consistent operating system. The group welcomes comments on the proposed specifications.

If you have any questions concerning this article, please call Ralph Landry on 492-3562 or Neil Thompson on 492-0735.



## SINET Application Enhancement Announcement

11/07/90

### SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE (SALP) REPORT ENHANCEMENTS

The SALP Schedule and White Book Reports have recently been enhanced to provide date range selection and additional sorting options. The SALP Schedule Report has been enhanced to accept Report From and To dates to provide the end user with more control over the assessment periods to be brought into the report. The SALP White Book Report has been enhanced to provide additional sort options as follows:

- Sort by Facility Name/Region
- Sort by Region/Final Report Date/Facility Name
- Sort by Final Report Date/Region/Facility Name
- Sort by Assessment Period End Date/Region/Facility Name

The SALP Schedule and White Book Reports can be generated by selection options 1 and 3 from the SALP REPORT SELECTION MENU.

For general information, assistance, or report samples and submittal instructions, call Wil Madison on 492-7781.

# NUDOCS

## NEWS NUCLEAR DOCUMENTS SYSTEM NEWSLETTER

### NUDOCS/AD Help Options

NUDOCS/AD provides several levels of online help to assist users in their search sessions. These help facilities include:

- Current Field and Screen Information;
- Current Function and Action Key Usage - "Valid Keys;"
- Lookup Tables for Coded Fields; and
- Help Prompts at the Bottom of Each Screen.

In the next few newsletters, the NUDOCs News Article will focus on the different NUDOCs/AD help facilities, and their use. In this issue, we will address how to obtain Current Field and Screen Information, and Function and Action Key help.

### Current Field and Screen Information, Valid Keys

You can access Help for both the Current Field and Screen, and the Function and Action Keys from any NUDOCs/AD screen by pressing the F1 function key.

When you press the F1 key, a screen is displayed which provides help for the field where the cursor was located when you requested help. Prompts at the bottom of this screen allow you to access information which is specific to the requirements of the field or, you may call up a listing of the valid Function or Action Keys associated with the screen from which you requested help.

This screen tailored help structure is available from any NUDOCs/AD screen. If you press the F1 key while the cursor is located at a menu choice, the screen which appears will discuss that particular menu option. At the bottom of these screens two

additional help selections will appear. They will be labeled as "Current Screen Information" and "Valid Keys". By using the "TAB" key to select either of these options and pressing your "ENTER" or "RETURN" key, you can obtain additional help.

Selecting "Current Screen Information" allows you to access more general information about the screen on which you were located. If you were located on the Main Menu, it would discuss the choices available and how they are made. From the Subject/Field/Boolean Search Screen, the help discusses the usage of the menu structure, and the various areas of the screen and the information they provide. From the Browse Screen, the screen specific help gives an explanation of how to move from field to field, and what the various fields should contain.

The "Valid Keys" help provides a listing of the Function and Action Keys which may be used to navigate through the Current Screen, or to cause action. This may include keys to move from field to field, move to the next screen, or list valid input for certain fields.

For example, let's suppose that you work for Office of Nuclear Reactor Regulation (NRR) and are attempting to access the NUDOCs/AD system for the first time. You have successfully connected to the system and are at the Sign-On Screen, but you are unsure of what to do next. The system is expecting you to enter your Affiliation Code (Office and Branch Identification), and your Initials.

The system's help facilities can help you identify and obtain the appropriate information through the Current Field and Screen Information Facility. By moving the cursor

to the appropriate field (in this case, the Affiliation Code) and pressing the F1 function key the screen will clear and will be followed by the appearance of a new screen which explains what the Affiliation Code is. It also advises you (at the bottom of the screen) that if you are not sure of your code, press the F2 key.

After pressing F2, a new screen will appear which lists organizations and their corresponding "Affiliation Codes". The very top information line will identify this screen as the "Sign-On Affiliations" Screen. If your organization appears on this screen, using the "ARROW" keys, simply move the cursor to the appropriate "code" and press the "ENTER" key on your keyboard. If your organization does not appear, you may "query" the system by pressing the F3 key, as instructed on the very bottom information line.

The screen will clear, and a new screen will appear. This screen is identical to the previous screen except there is no information listed under "Code" or "Organization" and you will note, the very bottom information line has changed. You may now enter a query and execute, or escape. To enter a query, press the "ENTER" key. You will see the cursor jump to the next field, "Organization". Remember, you don't know your Affiliation Code, but you do know that you are (for the purpose of this example) in the Office of Nuclear Reactor Regulation. Using the wild card feature of the system (%), type %nuclear reactor regulation% and press the F4 key to execute. The system will then print out the Affiliation Code "NRR" and list the organization as "Office of Nuclear Reactor Regulation."

By pressing the "ENTER" key, the system will automatically return to



the Sign-On Screen and insert "NRR" in the AFFILIATION CODE field.

At this point, based on the office and branch for which you work, the cursor may move to a blank space beneath the AFFILIATION CODE just entered. If this should occur, notice the very bottom information line. It is now asking for your division/branch code. Again, press the F2 key to obtain a listing. You will note that only those organizations under your office will appear, and the very top information line states "Sign-On Affiliations (Division/Branch)". The selection/query process is the same as described above.

Remember, if at some point you are unsure what to do next, there are help/instruction lines and screens throughout the system to assist you in navigating from one screen to another, and as always we have personnel manning the "Hotline" should you need us. The NUDOCs/AD Hotline may be called at FTS 492-8603 from 8:00 a.m. to 5:00 p.m., Monday through Friday.

## What's a Protocol Converter? What's a RENEX?

By Brian Brownell, IBM

A communications protocol is a set of rules governing the flow of information in a data communications link, network, or system. A protocol converter is a device that translates these rules that govern the interactions of processes or applications between differing computer systems and allows communications to take place. For example, a common protocol converter in use at NRC is the RENEX. This is a low-cost substitute for remote terminal control units used in IBM's 3270 Information Display Systems. These protocol converters allow asynchronous display terminals and PCs to be used as IBM 3270-type devices; they generally provide this capability through emulation of the major functions of the IBM 3274 Control Unit. In other words, a RENEX is one way of allowing an IBM PC to communicate with an

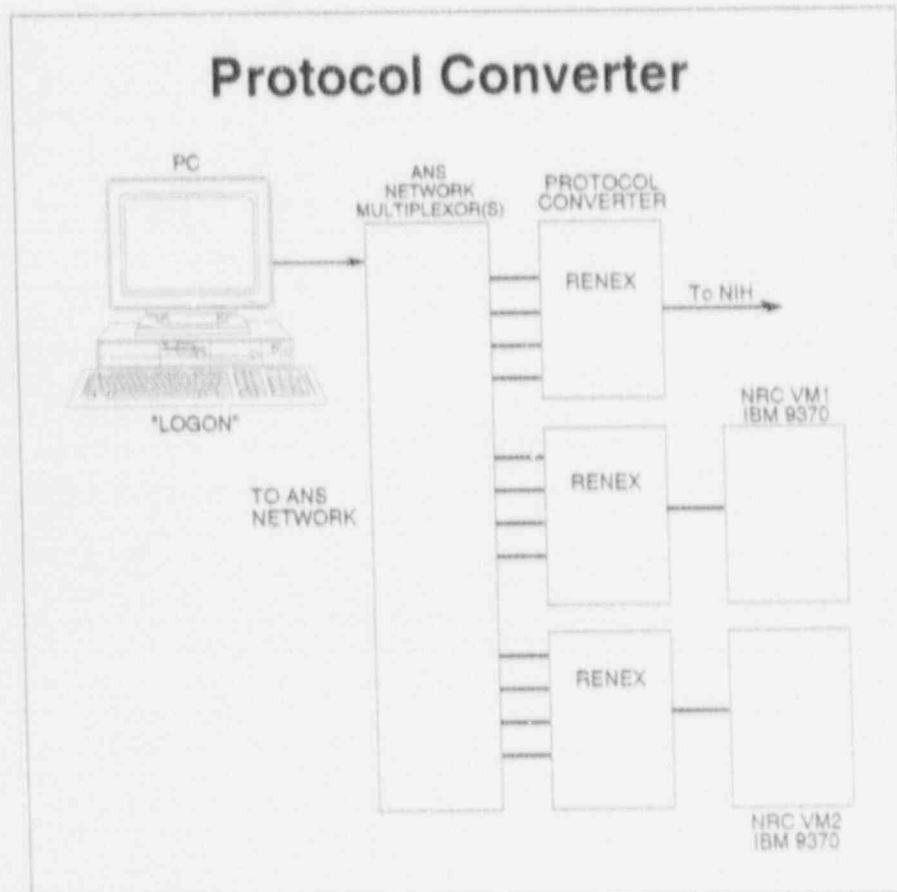
IBM mainframe computer system.

At the NRC, protocol converters provide asynchronous terminal users a gateway to the IBM mainframe and minicomputer world. Protocol converters also serve IBM users by providing an economical method of system growth without requiring major changes to existing host hardware or software. Protocol converters allow remote dial-up access via modem connections, data switches, or asynchronous data communication networks such as the Autodialing Network System (ANS). In fact, the NRC's protocol converters are installed as designations on the ANS; this has certain advantages such as monitoring contention, the ability to collect statistics, and the ability to perform diagnostic tests.

There are three protocol converters in use on the ANS. All three converters are the same model and made by the same manufacturer. One is connected to the National Institutes of Health Computer Facility, and the other two connect to the two NRC IBM 9370 computers located at One White Flint North.

NRC's Shared Information Network (SINET) users connect to the ANS, type their destination, "RENEX," followed by a carriage return, while users of the IBM 9370 machines type either "NRCVM1" or "NRCVM2" followed by a carriage return, depending on the IBM 9370 model they are accessing. The user is then prompted to "ENTER TERMINAL TYPE" or "M for MENU." This prompt is generated from the protocol converter, which must know what type of terminal is being used in order to properly perform its conversion function. The user enters the correct terminal type and then sees the banner (logo) from whatever host that has been selected.

Clearly, the use of protocol converters and microcomputers, rather than purchasing all the terminal types necessary for interaction with varied mainframe and minicomputer hosts, is more cost efficient. It is also far easier for the user than moving to a unique terminal type for each process he/she wishes to perform which requires connection to a host computer. If you have any questions concerning this article, please call Brian Brownell on 492-7927.



NRC's method of protocol conversion.



# TRAINING LAB NEWS

## ITS LAB Offers Three New Courses

In December, the ITS Lab expanded its graphics curriculum with "Introduction to Harvard Graphics," a one-day course designed for new users of Harvard Graphics software. Harvard Graphics is an easy to learn presentation graphics package. With it, NRC end users can produce a variety of charts in several media: 35 mm slides, overhead transparencies, and paper output for handouts or reports.

Janet Thor-Thompson, Chief of NRC's Automated Graphics Section, opens the class by providing participants with visual communication guidelines and an automated ScreenShow of chart templates she designed in Harvard Graphics using agency visual standards. ScreenShow is a feature of Harvard Graphics well suited to electronic presentations from a computer terminal for small meetings or full running displays and demos. She also provides each class member with the following job aids: diskettes containing a set of master design templates for more than 40 chart forms, documentation for these templates, and template worksheets for preparing charts that visually communicate and meet agency standards.

Participants then apply these visual communication principles in class. They learn how to create bar, line, area, pie, and text charts from an NRC template and also from scratch. Participants learn to annotate a chart by adding text, boxes, lines, and one of Harvard Graphics' pre-drawn symbols to enhance the chart's visual communication. Printing the chart and then preparing the chart for export to WordPerfect are the next class

activities. The class concludes with a student workshop. Teri Murphy is the developer and lead instructor for this training course.

The second new ITS Lab training opportunity is "Local Area Network (LAN) Orientation." This is an informative, lively 3-hour workshop on Local Area Networks. The workshop is conducted in a conference room, either at One White Flint North or in the NRC Training Complex in the Woodmont Building.

The course developer/instructor, Peggy Bree, explains LAN concepts and terms in a clear, non-technical manner. Drawing on participants' experience with the IBM 5520, NIH timeshare systems, and standalone PCs, she demonstrates how users can benefit from working on a LAN. She augments the presentation with selected highlights from a videotape, "Introduction to Local Area Networks."

An IRM representative is available to answer questions during each workshop session.

The third new course, "WordPerfect 5.1 for Users of 5.0," is a half-day session designed to train current WordPerfect 5.0 users in the major new products available with version 5.1. These include: tables, spreadsheets imported from other software packages such as LOTUS 1-2-3, and equations. This transition course offers both instructor demonstration of version differences and student hands-on exercises developing products available only in 5.1.

Teri Murphy is the developer and lead instructor for this new WordPerfect course.

## Introduction to End-User Computing Course Upgraded

As an outcome of its recent PC Curriculum Redesign, the ITS Lab has upgraded the entry-level user course required for all ITS Lab courses. The revised course is called "Introduction to Computer Resources." It replaces "Introduction to End-User Computing at NRC for Novices."

The revised course is a one-day presentation that acquaints participants with the microcomputer equipment and supported software available at the NRC. The instructor presents basic computer terminology in easily understood terms and shows students the hardware components that make up a computer workstation. Next, the instructor demonstrates typical work products created with NRC's word processing, database, spreadsheet, graphics, and telecommunications software.

In the hands-on portion of the course, participants use WordPerfect 5.0 to create, revise, spell check, and print a one-page document. They then learn to use 4 basic PC-DOS commands: FORMAT, DIR, COPY, and ERASE to manage their WordPerfect file. Students also receive a PC-DOS job aid to take back to their office workstations.

In the afternoon session, students attend a presentation on Computer Security, supplemented by a 15-minute videotape, "Computer Security-Make the Commitment."

Participants next receive assistance in planning their future computer education at NRC. They take a tour of the NRC's Individualized Learning Center (ILC) to become familiar

with self-paced study opportunities. The instructor then guides them through "Training Paths for Computer Education at the NRC." This document, included with the course materials, assists students in planning their further computer education by describing and illustrating training paths. A training path is a sequenced combination of classroom and self-study courses, with practice time allotted, for a major content area: (database management, for instance). Easy-to-read flowcharts illustrate each training path. Both employees and their supervisors will find this planning material helpful.

Arenda Holladay is the course developer and lead instructor for "Introduction to Computer Resources."

**NOTE:** Students who previously completed "Introduction to End-User Computing at NRC for Novices" have met their prerequisite for further ITS Lab training.

### Wizards in Computer History

Before John von Neumann turned to computers, he was already a world renown mathematician, with the rare ability for instant recall and mental calculation of complicated equations. A problem that took a better-than-average mathematician, with desk calculator, all night to calculate, took Von Neumann six minutes. He became intrigued with computers when he encountered the two ENIAC accumulators that could calculate faster than he could. He designed the EDVAC with 4000 vacuum tubes and 10,000 crystal diodes which was completed in 1952 and used until 1952. Many early computers were called "von Neumann machines," described as "very high speed automatic digital computing systems with a store programmable memory. A workaholic and careful dresser, von Neumann collected gadgets and loved to tell racy limericks.

## NRC-Developed System Codes Now Running on PCs

By George P. Marino, RES

For the past 30 years, the government and the nuclear industry have invested hundreds of millions of dollars for research and technical assistance programs to better understand how nuclear power reactors behave under normal, off-normal, and severe accident conditions. Most of the knowledge acquired from these programs has been assimilated into major computer codes that describe nuclear reactor behavior and accident consequences under various scenarios. Until very recently, most of these codes were too large and complex to run effectively on anything other than mainframe systems such as the CRAY and Control Data Corporation's CDC 7600. As a result, whenever the staff members needed to get information from these codes, they had to use the codes on a mainframe computer system operated by outside contractors. This has resulted in unfavorable and costly consequences to the agency, such as:

1. High cost and long waiting times for results of requested computer runs;
2. Restriction of runs to major problems with no allowance for multiple "what if" runs to help the staff analyze multiple accident scenarios;
3. Isolation of the staff from the intimate physical and mathematical details of the codes required to familiarize themselves with the codes' strengths and weaknesses; and
4. Overreliance on the contractor for evaluation of the results.

Now, however, the above situation is changing rapidly. The swift advances in personal computer

technology are making it possible for NRC staff to exercise many of the computer codes developed by the agency using PCs (with standard enhancements) at their workplace. To take advantage of this improving state of affairs, the Office of Research (RES) has recently contracted through the Small Business Innovative Research (SBIR) program for the development of PC-based full-scale versions of many NRC codes complete with plotting packages and a user-friendly interface program. The contractor, Risk Management Associates, Inc. (RMA) also supplied the source codes as well as a compilation system on five "enhanced" PCs. The staff can, therefore, not only run these codes on site, but can also examine, modify, and recompile the original source code, if necessary, for specialized scenarios or "what if" problems.

Compiled versions of these codes can be run on an IBM PC-compatible desktop computer with an Intel 80386 main CPU (central processing unit), an Intel 80387 math coprocessor, and 7 megabytes of extended RAM (random access memory). Some codes, such as CORCON, FRAPCON, MINET, and PRAMIS require less RAM, but any code can be executed if sufficient RAM is available. As stated earlier, the source codes are also available along with the compilation tools required to allow users to modify the code on the five special PCs supplied by RMA.

Future modifications to the five RMA-supplied PCs (soon there will be an additional machine in Nicholson Lane/North) are expected to decrease, by an order of magnitude, the execution times for typical problems by using the new Reduced Instruction Set Chip (RISC) processor running in the background under the new Windows 3.0 environment. Thus, users of the RMA machines can have full use of their PCs for other tasks while simultaneously executing long-running MELCOR or RELAP5 problems on the RISC chip board.



In addition to the RMA-supplied codes listed above, RES also has PC versions of other codes of use to the NRC staff. The IRRAS and SARA codes (described in the Spring 1989 issue) can be used to do fault tree analyses and front-end PRA computations. Finally, RES has recently developed and obtained computer codes for analysis of toxic gases and radionuclides in reactor control rooms as part of the resolution of Generic Issue 83, "Control Room Habitability." These codes have been named CRH, EXTRAN, and FRFP and are being tested by both RES (SAIB) and NRR.

It should be noted that running some of the more complex codes such as RELAP5, MELCOR, and SCDAP/RELAP requires (a) expertise in understanding the underlying principles used in each code, (b) familiarization with, and access to, input data, and (c) proper interpretation and usage of the output files. Thus, the user should have access to user manuals for the codes and preferably, some formal training and guidance.

In conclusion, RES developed a PC-based calculational capability whereby the NRC staff can perform in-house analyses using codes developed by the agency over the past 25 to 30 years. This capability does not eliminate the need for contractual projects; however, it does allow the staff to expend agency funds more efficiently and gain a better understanding of the strengths and weaknesses of our current analysis packages. If you have any questions, please call Dr. George Marino on 492-3986.

Contribute  
to  
ITS News!

Call 492-8309

The 16 codes currently (or soon to be) on site at Nicholson Lane/South include (an asterisk indicates codes currently available):

**MELCOR\***

A severe accident code for core, containment, and fission product behavior used in PRO (probabilistic risk assessment) analyses.

**RELAP5\***

A thermal-hydraulic systems code for both PWR and BWR general systems applications.

**MACCS\***

A consequence analysis code for radiological effects of fission product release scenarios.

**CONTAIN\***

A general containment behavior code, most of which is imbedded in MELCOR.

**STCP\***

The Source Term Code Package is a group of severe accident codes with a function similar to MELCOR but made up of earlier codes such as MARCH, TRAP/MELT, and CORCON (see below).

**CORCON\***

A code describing the behavior of liquid corium and concrete interactions.

**ORIGEN2\***

A code that computes the core inventory of fission products.

**BWRSAR\***

A core behavior code for severe accidents in BWRs (some modules are being incorporated into MELCOR).

**EVNTREE**

A code that processes event trees in PRAs to calculate their frequencies of occurrence (used in NUREG-1150).

**PRAMIS**

A code that computes risk, given sequence frequencies and consequence analyses (used in NUREG-1150).

**XSOR**

A parametric code for computing source terms for various scenarios. Given a specific source term via a MELCOR or STCP calculation, XSOR approximates the total source term (used in NUREG-1150).

**FRAPCON**

A steady-state operation fuel element behavior code.

**FRAP-T6**

A transient (LOCA, ATWA, and etc.) fuel element behavior code.

**MARCH\***

An early severe accident core behavior code used in STCP.

**MINET\***

A thermal-hydraulic behavior code for analyzing transients in liquid metal reactors.

**SCDAP/RELAP**

A highly detailed core and thermal-hydraulic behavior code for severe accident and accident management analyses.

## Software Quality Assurance (SQA) Seminar

By Emily Robinson, IRM

Software Quality Assurance (SQA) continues to be an interesting topic according to comments from the attendees at the SQA Seminar on January 9, 1990. Eileen McKenna gave the welcoming remarks. Peter Barletto, Niagara Mohawk Power Corporation and present Chairman of the Nuclear Utilities Software Management Group (NUSMG) gave a talk entitled, "Addressing the Emerging Issue of SQA." He spoke about the need for SQA and shared some first-hand accounts of how to implement a total SQA program. He informed attendees of the purpose and membership of NUSMG, and explained what this group is doing to improve software quality in the nuclear industry.



# TECH NOTES

This section of the newsletter provides tips and technical information of interest to NRC computer users. If you have any questions regarding "TechNotes" or if you wish to contribute an item, contact the ITS Support Centers: For PC and NIH items, call 492-4160 or 492-0353; for INEL items, call 492-3490 and for DG items, call 492-3491. You may also drop by and visit in OWEN 3C-12.

## Personal Computers

### HARDCARD ALERT

When transitioning from a dual floppy diskette drive to a hard drive PC, the HARDCARD has been identified as an interim solution. However, quickly accumulating evidence warns USER BEWARE. An unusually high incidence of HARDCARD failure prompts the ITS Support Center to provide the following warning and advice:

- (1) Only vendor or application software should reside on the HARDCARD.
- (2) Data should be created and maintained on floppy diskettes.
- (3) Backup copies of all data should be maintained on floppy diskettes.

HARDCARDS have failed within six months of installation. When a HARDCARD dies, there is no recovery procedure. Don't let a HARDCARD failure ruin your day. Practice safe computing by backing up your data on floppy diskettes.

### ACCIDENTAL FILE ERASE

If you accidentally erase a file, "Who you gonna call?" Definitely not Ghost Busters, but do call the ITS Support Center on 492-4160 or 492-0353. DO NOT LET ANYONE USE YOUR MACHINE. SPECIFICALLY, DO NOT SAVE A FILE. There is a good possibility

that through a software utility program, the ITS Support Center will be able to recover your lost file(s).

### ITS ADP LIBRARY UPDATE

The ITS ADP LIBRARY has added LASERJET JOURNAL and WORDPERFECT MAGAZINE, which are monthly publications, to its inventory of reference materials.

### SENDING LOTUS 1-2-3 DATA TO dBASE:

#### AN ALTERNATIVE TO "TRANSLATE"

The traditional and documented way of sending LOTUS 1-2-3 data to dBase III Plus is by utilizing the TRANSLATE feature within LOTUS 1-2-3. However, a frequent client of the IRM Hotline has shared the following alternative procedure with the ITS Support Center. After review and evaluation, we would like to share it with the NRC's LOTUS and dBase communities. Thanks Duane Kidd, ADM/DSEC, for your suggestion.

#### PREPARE DATA:

1. In the event that all does not go smoothly the first time around, practice safe computing by creating a backup copy of the appropriate 1-2-3 and dBase files (preferably on a floppy diskette).
2. The name of each 1-2-3 column must match the dBase field name. NOTE: A 1-2-3 row equates to a dBase record.
3. There should be no breaks between rows or columns.
4. There can be no extra data, macros or blanked spaces in the spreadsheet.

5. If necessary, use /Range Erase to erase all columns to the right of the data and all rows below the data.
6. Check the spreadsheet before erasing.

#### INCORPORATE DATA:

1. Save the 1-2-3 file in the dBase subdirectory.
2. Invoke dBase.
3. At the Dot Prompt, USE your database.
4. Type GO BOTTOM and press ENTER.
5. Type APPEND FROM FILENAME.WK? TYPE WKS and press ENTER (where "?" equals "1" or "S" depending on the extension given to it by 1-2-3).
6. Upon completion, BROWSE the database and check to be certain that the transfer worked properly.
7. Press CTRL. W to exit from BROWSE.

### EXPORTING A HARVARD GRAPHICS GRAPH TO WORDPERFECT 5.0

To use a graphic from Harvard Graphics (HG) in a WordPerfect 5.0 (WP) document, convert the graphic to CGM (Computer Graphics Metafile) while still in HG. Video Display Interface (VDI) files must exist to accomplish the transfer. If the error message "VDI is not installed" appears during the export process, please call the IRM Hotline on 492-4160 for software installation assistance.

#### HG:

1. Invoke HG.
2. Create your graphic as usual.
3. Save the file and return to the HG MAIN MENU.
4. Select 5 IMPORT/EXPORT.
5. Select 7 for COMPUTER GRAPHICS METAFIELD.



# TECH NOTES

6. Type in the path where you want the new file to be stored (use up arrow for screen navigation), e.g.,  
DIRECTORY:  
CA\WP\WPDOCS or  
CA\HGDATA.
7. Press ENTER.
8. Type METAFILE NAME (name of the HG graph); then press ENTER. A ".CGM" file extension will be added.
9. Reply "NO" to Use Harvard Graphics font.
10. Press F10 to export the chart as a Metafile.
11. The messages "SAVING" and "PROCESSING" will be displayed.
12. Once completed, exit HG.

#### WP:

1. Invoke WP.
2. Retrieve the WP document into which you want to import the graphic.
3. Position your cursor at the location where you want to import the graphic.
4. Press ALT F9 (GRAPHICS).
5. Select 4 for USER-DEFINED BOX.
6. Select 1 for CREATE.
7. Select 1 for FILENAME.
8. Type in the (Metafile) name of the Harvard graphic you wish to import; include the new extension ".CGM". If the file does not exist within the current directory, be sure to include the full path name to tell WP where to look for the graphic.
9. As desired, use other (Edit) options of the WP GRAPHICS menu to manipulate the graph.
10. Press SHIFT F7, Select 6 to VIEW and verify that the graph is in place.
11. Press F10 to SAVE the document AND CONTINUE, or press F7 to SAVE AND EXIT the document.

Additional information may be gained by reading the GRAPHICS discussion found in the REFERENCE section of the WP documentation, and GRAPHING DATA - IMPORTING/EXPORTING in the HG documentation. Hands-on training of this capability is available through a new course offered by the ITS Training Laboratory, titled, "WordPerfect 5.0, Module 3: "Fonts, Graphics, and Viewgraphs."

### USE SIDEKICK WITH CAUTION

TSR stands for TERMINATE and STAY RESIDENT. SIDEKICK is a TSR. Normally in the DOS environment a program is loaded into memory, used, and then is 'erased' from memory upon exiting. TSRs are not erased; they stay in memory, running in the background, ready to pop up at the press of a key or two (known as hot-keys). It is this ability that makes them so wonderful. One may be using WORDPERFECT and still have access to other programs without leaving the original.

The **problem** with TSRs is that the operating system (DOS) was not designed to run more than one program at a time (multi-tasking). Getting a program to stay resident and active yet transparent is a complex process, requiring the programmer to use a number of exotic techniques in order to **force** the operating system into acceptable multi-tasking SIMULATION.

Between this and the fact that most applications (such as WORDPERFECT) now contain a DOS shell (SIMULATING the DOS environment WITHOUT leaving the application), the chances for collision between the TSR and the application are great. This collision

is probably known to you as: "Hey, why is my PC frozen?"

Once you load SIDEKICK into memory, you are not stuck with having it memory resident. SIDEKICK can USUALLY be removed from memory WITHOUT having to re-boot your PC. This procedure is documented on pages 11 and 12 of the version 1.5 user's manual. In other releases look for "HOW TO STOP SIDEKICK" in the table of contents.

The procedure is simple enough. To remove SIDEKICK from memory, press the CTRL+ALT keys simultaneously (or whatever you may have modified the "hot-keys" to be). The familiar SIDEKICK main menu will appear. This is the point where removal is manifested. With the main menu on the screen, hold down the CTRL key, and press HOME+END simultaneously. You will see an extra DOS prompt appear on the screen, and SIDEKICK is removed and the RAM regained.

Sometimes this procedure will result in nothing, or SIDEKICK will beep at you (SIDEKICK can be pretty stubborn at times). **Keep pressing and releasing the appropriate keys and SIDEKICK should eventually remove itself.** If this does not seem to work for you, you will have to reboot. It does NOT always work, generally because **something has been loaded AFTER SIDEKICK.**

In order for this command to work, a number of things must be taken into consideration. The best place to remove SIDEKICK is at the DOS prompt. Removal may only occur properly if SIDEKICK was the **LAST PROGRAM LOADED INTO MEMORY, TSR OR NOT.** The worst place to attempt removal is



when an application (WORDPERFECT, etc.) is running. Removal SOMETIMES does occur successfully, but more often than not it results in NOT returning the memory used. It is also known to lock up the keyboard, requiring a cold-boot.

SIDEKICK should be removed before running any application that uses GRAPHICS, is emulation oriented (5520), is TELECOMMUNICATION oriented (XTALK), or uses 384K of memory or more. Conflicts have been observed with all four of these types. Sometimes the application comes up, but does not operate properly. GRAPHICS programs can be a source of frustration.

In the SIDEKICK installation program, you are given the choice of popping-up over graphics. Even when replying "yes," popping over graphics can "blow up" the screen (sometimes it is repaired on closing SIDEKICK). Obviously, SIDEKICK should be removed before running anything with which you have experienced previous conflict.

## DISPLAYING AND HIDING COLUMNS IN LOTUS 1-2-3

A basic macro in LOTUS 1-2-3 is an automated succession of 1-2-3 menu keystrokes. This is accomplished by placing the exact keystrokes needed into the 1-2-3 worksheet just like data, and then supplying a name to the first cell of code.

The macro name syntax is as follows: It **must** begin with the backslash (\) character, and be followed by a **single** letter of the alphabet. The macro name **shares** a cell with the first line of code. The code will be visible in the cell, but the macro name will not. This is one of the more confusing aspects of 1-2-3. If

one wishes the macro code to begin in cell D22, cell D22 must also be "tagged" with the macro name, as well as containing the executable code. The macro is invoked by holding down the ALT key and simultaneously pressing the corresponding letter key (ALT P for example) of the macro name.

Since the macro we are contemplating here is basically a print macro that first displays, prints, and then rehides column(s) of sensitive data, it might be named \P, for Print. (NOTE: using the letter "P" for Print is known as MNEMONICS). To place the keystrokes in macro form, four simple concepts must be utilized.

1. Macro code execution begins at the named cell and continues downward, until a blank row is encountered at which time macro execution terminates. Each succession of keystrokes originating at the main menu should be in a cell by itself, as in this pseudo-code:

```
Display Column A
Print Cells A1 Through F20
Hide Column A
```

The macro entry for this pseudo-code would look like this:

```
'/WCDAL..A1~
'/PPRAL..F20~AGQ~
'/WCHAL..A1~
```

If one wished to hide/display other columns as well, the code entry might look like this:

```
'/WCDAL..A1~
'/WCDCL..F1~
'/PPRAL..F20~AGQ~
'/WCHAL..A1~
'/WCHCL..F1~
```

The pseudo-code for this second macro would look like this:

```
Display Column A
Display Columns C, D, E, & F
Print Cells A1 Through F20
Hide Column A
Hide Columns C, D, E, & F
```

2. If you type the slash key at the READY prompt, the main menu will "pop-up" as always. To enter menu choices in a cell as macro code, it is necessary to type the tick mark ('), also known as single quote, before typing the slash. This technique allows the entry of menu choices as 1-2-3 labels.

3. The symbol that 1-2-3 uses for a carriage return (pressing the ENTER key) is the tilde (~). Anywhere that you would be forced to enter a carriage return while using the menus must be accommodated within the macro code. Carriage returns must also be included at the end of most lines of macro code. If in doubt as to whether or not to conclude a line with a tilde, either do it or consult the manual. It generally does no harm to conclude a line with a tilde, even if the code does not require it.

4. One may hide or display **entire** columns. There are 8192 rows in a 1-2-3 worksheet. Therefore, if one hides column A, all of column A from A1 through (.. in Lotusese) A8192 will be hidden. When asked by 1-2-3 what to hide (which must be hard-coded in your macro) you may specify A1..A8192, or simply (A1..A1). In other words, specifying A1..A1 is exactly the same as specifying A1..A8192. (When doing this procedure manually, you will notice that it is necessary to press ENTER after entering the range. This is also true in the macro).

5. A quicker way to view hidden columns from anywhere in the worksheet, and an alternative to "/Worksheet Column Display", is to



## TECH NOTES

hit the plus sign <+> while in Ready mode. All hidden columns and their contents will be temporarily revealed, and you can use the cursor to move around the spreadsheet. Hitting <Esc> twice hides the columns again, removes the plus sign from the Control Panel's entry/edit line at the top of the worksheet, and takes you back to where you began.

As with all new things, the best way to begin is to manually go through the display, print, and hide procedures to ensure familiarity with the operation of the commands and the menu prompts. Reading the 1-2-3 manual can be illuminating as well. Once you feel confident, create a simple macro to build upon later. The macros noted in this article are a good starting point if you have never written a macro before.

### 101 SECRET TIPS

PC WORLD's January 1991 issue contains an excellent article providing 101 tips to unlock the power of 27 software packages, including: DOS, WP, Paradox, dBASE III+ & IV, LOTUS 1-2-3 2.2, Quattro Pro, HG, Xtalk XVI & Mk. 4, Procomm Plus, and more. Request your copy by calling the ITS Support Center on 492-4160 or 492-0353.

Please note that the IRM Hotline does not provide support for all software packages identified in this article. Reference the Fall 1990 ITS NEWS issue regarding IRM Hotline supported software packages.

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### INEL

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#### INEL CHARGES

Reminder! CRAY charges will remain at lower rates all through FY91. Take advantage of this chance to use the CRAY and do production runs.

#### HOT KEY ON UNIX

The UNIX system on the CRAY usually processes information one line at a time. This is a disadvantage to the programmer who wishes to have a program read input one character at a time. Fred McClurg at EG&G discovered an easy way to overcome this problem. His mini-routine is printed in entirety in the November Issue of INEL's "Exchange." If you wish a reprint, please call Emily Robinson on 492-3490.

# NUCLEAR REGULATORY COMMISSION

## ITS SUPPORT CENTER FACILITIES

### Locations:

**Phillips Building, Rm P-358**    **One White Flint North, 3C-12**  
7920 Norfolk Avenue,    11555 Rockville Pike,  
Bethesda, MD 20814    Rockville, MD 20852

**Phone:**  
(FTS) or (301)492-4160    (FTS) or (301)492-0353

### Center Hours:

7:30 a.m. - 4:15 p.m. M-F

### Services:

User Assistance (Telephone & Walk-in), Equipment and Software for Trial Use, Demonstrations, Technical Library, and Computer/Video-based Tutorials. Support Center Project Manager, Phyllis Smith; AMC1 Project Manager, Arthur Thomas.

## TRAINING LABORATORY FACILITY

**Location:**    3rd Floor Woodmont Building  
8120 Woodmont Avenue,  
Bethesda, MD 20814

**Phone:** (FTS) or (301)492-4744    **Mailstop:** W-306

**Laboratory Hours:** 7:30 a.m. - 4:30 p.m. M-F

**Class Hours:** 8:30 a.m. - 3:30 p.m.

### Services:

Three classrooms for formal ADP training including one equipped with eight IBM XT's, one with eight IBM PCs with Hardcards, and one with PS/2 Model 30 286. "Hands-on" instruction in the use of microcomputers and timesharing systems.

Note: The Training Laboratory is operated by the Graduate School, USDA under contract and managed by the Office of Personnel, to provide training in end-user computing for the NRC staff. Technical guidance is provided by IRM. NRC Project Manager, Carolyn Bassin; GS/USDA Training Manager, Kathy Beckman.

## NRC END-USER COMPUTING SERVICES DIRECTORY

### Microcomputer Hardware/Software Acquisition, Upgrades:

Please contact your local ADP Coordinator to initiate this action.  
John Burton, P-530, 492-4836

### Microcomputer, word processor, other ADP Relocation:

Please contact your local ADP Coordinator to initiate this action.  
Beth DeWoody, P-500, 492-4832 or 492-8310

### Microcomputer Hardware Installation:

Karen McEllyea, P-500, 492-8906

### Microcomputer Hardware Maintenance:

Karen McEllyea, P-500, 492-8906

### Microcomputer Software Installation:

Jennifer T'iberti, P-500, 492-8317

### Word Processor, Other ADP Maintenance:

Please contact your local ADP Coordinator to initiate this action.  
Beth DeWoody, P-500, 492-4832

### Modem and Data Line Problems:

Brian Brownell, P-500, 492-7927

### Modem and Data Line Acquisition:

Stan Wood, P-626, 492-7723

### Computer Room:

Phillips 492-7713  
White Flint 492-0885

### Computer Security:

Louis Grosman, MNBB-8720, 492-5019

### Timesharing Access/IDs:

Herb Parcover, MNBB-8720, 492-8699

### User Support for Hardware/Software (PC & NIH):

ITS Support Center, Phillips Bldg., P-358, 492-4160  
One White Flint North, 3C-12, 492-0353

### Data General and INEL User Support:

Pat Bell, 3C-16, 492-3491  
Emily Robinson, 3C-14, 492-3490

### SINET Hotline: 492-4222

NUDACS Hotline: 492-8603

LAN Hotline: 492-4243

### Data General Systems Problems:

Judy Secherman, P-612, 492-9687

**IBM PROFS/E-Mail Support:** Sharon Root, OWFN 3C12, 492-0256

### Electronic Records Support:

Brenda Shelton, MNBB-7714, 492-8132

**Graphics Support:** Janet Thot-Thompson, 2G-40, 492-0215

**Commercial Database Support:** Eileen Chen, 160, 492-8501

**Scientific Code Distribution - NESC:** Pat Bell, 3C-16, 492-3491

### Shared Information Network (SINET) Development:

Dick Hartfield, P-712, 492-4328

### Systems Development and Modification:

Bill Usilton, P-712, 492-8322

### Scheduling for ITS Training Laboratory

Kathy Beckman, W-306, 492-4744