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

April 4, 1997

MEMORANDUM TO: John J. Surmeier, Deputy Director
Program Management, Policy Development
and Analysis Staff, NMSS

Frederick C. Combs, Deputy Director
Division of Industrial and Medical
Nuclear Safety, NMSS

E. William Brach, Deputy Director
Division of Fuel Cycle Safety
and Safeguards, NMSS

Charles J. Haughney, Deputy Director
Spent Fuel Project Office, NMSS

FROM: Margaret V. Federline, Deputy Director
Division of Waste Management, NMSS

SUBJECT: OFFICE WIDE IMPLEMENTATION OF MS PROJECT SOFTWARE

As you are aware, Dr. Paperiello has expressed the desire to improve project management throughout the Office by using a consistent set of project management tools to schedule and manage various "projects." The term "project" in this case should be broadly interpreted and would include such diverse activities as the management of a site license or a contract. As part of a phased approach for improving project management Office-wide, staff and management would initially become familiar with software currently available to plan and track project status. The next phase would involve the development of Office-wide procedures to promote consistency in the application of this project management software. Late last year, I was assigned the task of evaluating various project management software packages for use as an Office standard. Assisted by a task force consisting of representatives from each of the Divisions, I recommended the use of Microsoft (MS) Project software (see attachment). Based on this recommendation, Dr. Paperiello has approved the purchasing of MS Project for all project managers and personnel who serve in similar functions in the Office. The expectation is that we will use this software to support Office level presentations. I am working with PMDA to arrange purchase of the software and appropriate training. However, I need a list of those in your Division who should receive the software. Please provide me a prioritized list by April 15, 1997, of project managers or staff in your Division who perform similar functions. If you have any specific questions about this request, please contact me or John Thoma.

Attachment: As stated

CONTACT: John O. Thoma, NMSS/DWM
415-7293

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CONTACT: John O. Thoma, NMSS/DWM
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CONTACT: John O. Thoma, NMSS/DWM
415-7293

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415-7293

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Attachment

January [illegible], 1997

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

FROM: Margaret V. Federline, Deputy Director
Division of Waste Management, NMSS

SUBJECT: RECOMMENDATIONS FOR THE SELECTION AND IMPLEMENTATION OF PROJECT MANAGEMENT SOFTWARE FOR NMSS APPLICATIONS

As requested during the NMSS retreat held October 1-3, 1996, the attached report contains recommendations for the selection and implementation of project management software for NMSS applications. The recommendations are based on the research and evaluation of project management tools by a nine-member NMSS team, chaired by John Thoma, Section Leader in the Division of Waste Management's Performance Assessment & HLW Integration Branch. Based on an action plan which Mr. Thoma and I discussed with you in November 1996, the team evaluated the Management Software (MS) Project, as well as researching the attributes of other project management tools. In addition, the experiences of other NRC offices and the availability of training were considered in the development of our recommendations.

As discussed in the attached report and its enclosures, we recommend the adoption of MS Project as an office-wide standard as a first step to improve scheduling and tracking. In order to further improve project management so that schedules are more realistic and budget projections are more accurate, a phased-approach is recommended for implementing use of the software. We believe the phased-approach we are recommending will greatly improve staff accountability for project management, but will require a commitment of management attention and time to fully implement improved project management techniques.

Attachment: As stated

Contact: Margaret Federline, NMSS
415-6708

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EVALUATION OF PROJECT MANAGEMENT SOFTWARE

I. Objective: To identify the objectives for the potential use of project management software for standard office-wide use and to evaluate the specific ability of Management Software (MS) Project, and other project management tools, to satisfy these objectives.

II. Method

A. A team was assembled from NMSS staff to (1) identify objectives for the potential use of project management software on an office-wide basis and (2) to evaluate MS Project software, and other project management tools, in meeting these objectives. The team was composed of nine Project Managers and Administrative personnel representing all NMSS Divisions. MS Project software was provided to all team members. The Office of Personnel arranged for a one-day training course and a half-day consultation session to answer specific questions about the software.

B. An Action Plan was developed and the team met on almost a weekly basis. Enclosure 1 contains the Action Plan and the list of team members. Although some activities were not totally completed as a result of time constraints, the primary objectives were completed. One element of the Action Plan was to contact representatives from NRR, RES, and IRM concerning their experiences in developing, implementing and using software for project management functions. Enclosures 2, 3, and 4 provide a summary of the results of discussions with representatives from NRR, RES, and IRM, respectively. Any opinions expressed in this report are solely the opinions of the individuals interviewed and are not the official office decisions or opinions. Additional recommendations about project management in general are expressed in Enclosure 5, along with background material on MS Project software.

III. Results

A. Several PC-based software packages on the market today facilitate some level of project management. The software packages investigated by the team include Timeline, MS Project, Harvard Project Manager, and SuperProject Plus. For these software packages, approximately 70 percent of the functions are the same. Whether-or-not one of these software packages is better than the rest depends on the specific application for which the software is used and the skill of the personnel assigned to do the task.

B. Several individuals interviewed indicated difficulty in using Timeline, particularly when multiple staff were involved who were infrequent users of the software. The team did not have a current version of SuperProject Plus, but earlier versions of this software were more difficult to use than the available MS Project software. For both of these products, perhaps more training would overcome the problem; but the extent of the necessary training is unknown at this time. Harvard Project Manager may or may not be on a par with MS Project, but that is a debatable point and only one team member had direct access to this software. However, several individuals using Harvard Project Manager were interviewed and all were using the software solely for single projects. No person the team contacted was using Harvard Project Manager as a basis for developing branch, division, or office level reports summarizing multiple projects.

Attachment

C. MS Project software proved to have several advantages. First and foremost, the software was user friendly and yet fairly powerful at the same time. All nine personnel assigned to the evaluation team could quickly load data on individual projects. The program allowed planning, tracking progress, evaluating impacts of resource changes, and correlating contract milestones and commitments, obligations, and expenditure of funds. It allows for maintaining a baseline and a revised schedule and can easily display projected expenditures with actual expenditures, if the resource numbers are available. All of the project management software have a weakness in rolling multiple projects into a single report at the branch, division, or office level. However, NRR is working with a contractor to specifically improve MS Project software in doing roll-up reports and NMSS could benefit from this activity. In addition, in-house training on the software is readily available within existing training budgets. Enclosure 5 discusses other advantages of MS Project.

IV. Recommendations

A. As a first step to improving scheduling and tracking through automation, MS Project is recommended as the office-wide standard for project management software.

B. In order to further improve project management so that schedules are more realistic and defendable and budget projections are more accurate, the following phased-approach is recommended for implementing use of the software. The first phase would consist of making available the MS Project software to all appropriate personnel, which would include, as a minimum, all project managers and their supervisors and perhaps technical section leaders. At this stage, the branch would determine the standard minimum data to be entered on all projects. During the second stage, standard project management procedures and techniques should be adopted to ensure that consistent data is being tracked throughout the office. The third stage, which will require contractor assistance, would develop techniques of rolling the data into higher order reports for management to monitor progress. A fourth stage would be accomplished in parallel with the other three stages and involves training for both supervisors and staff on project management techniques and the use of MS Project software. Costs associated with all stages include procurement of software and documentation, training, and contractor assistance. In addition, the highest cost component is a consistent and universal commitment of management's attention and time to make the system work.

C. A specific management entity should be designated to plan and monitor all four stages described above.

Enclosures:
1. MS Project Evaluation Plan of Action
2. Discussions with NRR Concerning Project Manager Software
3. Discussions with RES Concerning Project Manager Software
4. Discussions with IRM Concerning Project Manager Software
5. Background Information on MS Project Software and Recommendations for Improving Project Management Within NMSS

MS PROJECT EVALUATION
PLAN OF ACTION

- Office representatives

  FCSS: Joan Higdon, Tom Cox
  IMNS: Cheryl Barnes
  SFPO: Mike Raddatz
  PMDA: David Titinsky
  DWM: Mike Fliegel, Jim Shepherd, Sandra Wastler, John Thoma

- Work with assigned office representatives to identify objectives for use of software. Potential objectives could be:

  1. Plan projects
  2. Track project progress
  3. Evaluate impacts of timing and resource changes on projects
  4. Correlate budget expenditures with project milestones
  5. Trace contract milestones and commitments, obligation, and expenditure of funds
  6. Section leaders/management assignments for project managers and technical resources based on project milestones and workload
  7. Section Leaders/Branch Chiefs use as a management tool to track interim status and project completion
  8. Office management tool to evaluate resource and staff shifts between Divisions
  9. Ease or user friendliness of the software package

- Simultaneously with the office representatives, ask Office Director, Deputy Director, and Division Directors for additional objectives based on the needs of management **(not accomplished)**

- Prioritize the objectives received **(not accomplished)**

- Have office representatives evaluate MS Project software against the objectives identified

- Meet with IRM, NRR, and RES to identify other candidate software and the results of any evaluations they might have done

- Based on comments received, contact appropriate vendor representatives to try and address concerns identified

- If MS Project found not to meet priority objectives, consider other software packages

- Identify purchasing costs and training needs for software

Enclosure 1

DISCUSSIONS WITH NRR CONCERNING
PROJECT MANAGER SOFTWARE

I. Personnel contacted/areas discussed: Three personnel from NRR were contacted to discuss NRR's Workload Information System Program (WISP), Reactor Program System (RPS) under development by NRR, and lessons learned from developing these two systems. The following contains a summary of the discussions in each area.

II. Workload Information System Program (WISP)

A. WISP is the principal scheduling tool used by NRR over the last few years.

B. It is a simple scheduling tool that allows tracking individual tasks and resource loading. It is directly updated from RITS to track and report actual resource application. Although it is a simple scheduling tool, it is a complex system that is fairly labor intensive to implement.

C. WISP does not have full project management software capabilities. For example, all technical reviews are considered to be done in parallel: consequently tasks cannot be linked. However, the first line supervisor can determine when a specific resource (person) is or is going to be over-allocated (more than 40 hours per week).

D. Because WISP does not have full project management software capabilities, NRR is developing a method to download WISP files into MS Project. WISP will serve as the database repository; MS Project will serve as a project planning tool. This transfer of data is not a simple task and requires a contractor to do some programming to complete. The development effort is near completion and ready for implementation.

E. Why did NRR choose MS Project software? First, two persons were identified. After trying Timeline, they had extreme difficulty transferring WISP data to Timeline and eventually ceased their efforts. The transfer of data from WISP to MS Project had problems of its own but was much easier to accomplish. Second, NRR believes IRM is going to the MS suite as the standard Agency softwa . Upon further questioning, NRR admitted that IRM rarely declares software as the "Agency standard," but most of the training courses and software purchased indicate a trend towards MS products, in general. NRR did receive from IRM a write-up for a sole source justification for the use of MS Project for the RPS system (discussed in III.F below) which factored into NRR's decision to use MS Project for the WISP application.

III. RPS (Reactor Program System)

A. RPS is a new system being developed by NRR to plan reactor inspections. It is attempting to combine a number of systems (about ten different systems) into one system for planning purposes.

B. The input from the Regions will be from MS Access and at Headquarters it will be integrated into MS Project It will also have direct input from RITS. The moving of data between Access and MS Project has required the use of a contractor to do some programming. Additionally, NRR received IRM input to develop a sole source justification for the purchase of MS Project which read as follows:

SOLE SOURCE JUSTIFICATION FOR PROCUREMENT OF MICROSOFT PROJECT SOFTWARE FOR THE REACTOR PROGRAMS SYSTEM

The Reactor Programs System requires an integrated set of client-server software to effectively manage inspection-related activities at nuclear power plants. A major system requirement is the implementation of a fully integrated and cost effective Commercial Off the Shelf project management software package to manage all inspection resources and activities. The criteria for selection were: 1) client-server architecture; 2) windows compatibility; 3) UNIX (AIX) compatible; 4) programmable API; 5) integrated resource planning module; and 6) cost effective.

In September 1995, IRM performed an extensive review of several major project management packages, matching capabilities against the above criteria. The results of the review are listed below:

Autoplan by Digital Tools - cost prohibitive
Artemis by Lucas management - no integration resource planning module
Micro Planner by Micro Planning Intl - not client-server architecture
Interplan by Interplan Systems - character based, not windows
CA-Super Project by CA Intl - not UNIX (AIX) compatible
CATII by Robbins-Gioia Inc - no API kit
MS Project by Microsoft - meets all criteria

As a result of the above review, MS Project was selected and successfully integrated into the RPS system prototype. Additional client copies are required to implement RPS into production for Headquarters and regional system users.

C. The system is near completion, but has not yet been implemented.

IV. To put the software on the LAN, NRR purchased a general license for 50 people. A total of more than 50 people will be using the software for both the RPS and WISP applications, but the logic is that no more than 50 people will be using the software at the same time. Therefore, NRR does not need to purchase a license for every individual who may be potentially using the software. However, this is somewhat on the honor system because there will be no counter on the system to indicate how many staff members are using the software at any given instance. IRM worked with NRR in obtaining approval for this purchase.

V. Lessons Learned: The following summarizes staff personal, candid observations and should not be considered NRR official office level comments.

A. If you want to implement office-wide project management software, start simple. NRR attempted to implement a full system involving all aspects of project management (scheduling, resource loading, etc.) all at once. The project was initiated with great intentions, but one of the project weaknesses was that the developers did not evaluate the absolute minimum data set necessary to achieve management goals. As each contributor developed an idea for data collection, it was added to the system. The end result is a fairly complex system that requires a great deal of data to be entered by a multitude of people. If any branch or section fails to properly enter data, the system has inadequate data to function properly. Instead of focusing on scheduling, some staff members feel they focus on data entry.

B. The current project manager software appears to work well at an individual project level. Problems develop attempting to roll-up data at the branch, division, or office level and entering other outside sources of data, such as RITS. As more levels of reporting are added, the amount of data necessary to support the system increases fairly rapidly and the system slows down. That is why it is very important to define the minimum data set necessary to achieve whatever is defined as the ultimate goal.

C. To really implement traditional project manager functions requires fairly strong management oversight and commitment. For example, for the software, NRR has found a fairly high level of direct management involvement required just to make sure the data is constantly updated. To be effective, management buy-off on the needs and goals of the program and management support for full implementation must be almost universal.

D. Be sensitive to the needs of all levels. The people inputting the data (specifically the project managers and reviewers) need to see a tangible and direct beneficial result to their efforts. Otherwise, an attitude or perception will develop in the staff that they are inputting data solely so that management can receive reports, but has no value at the staff level. This counteracts a major objective which is to achieve accountability for project management at the staff level.

E. Recognize that each staff member has his own style of managing projects and any overall scheduling system developed should have some flexibility and not be too complicated to implement. By the same token, some ground rules should be clearly established to form the minimum data set. For example, for each task in the system, NRR requires either a TAC number or an inspection number as a way of connecting data from different data sets together.

F. Any system developed should have a feedback mechanism built in so that personnel are informed immediately that certain data entered does not appear to be correct or critical fields are blank. In addition, some type of timely reports need to be made to management to ensure corrective action can be taken in a prompt manner, particularly for inadequate data entry.

DISCUSSIONS WITH RES CONCERNING
PROJECT MANAGER SOFTWARE

I. Personnel contacted/areas discussed: Two personnel from RES (Research) were contacted to discuss the office experience with the use of project management software and the Research Information Management System (RIMS). The following contains a summary of the discussions in each area.

II. Project Management Software Experience

A. Research chose to put Timeline on the network but it proved to be too difficult for a significant number of the staff to use on an infrequent basis. The specifics of the difficulties were not discussed.

B. Research is now purchasing copies of MS Project on an as requested basis for individual project managers who are finding the software more easy to use.

III. Research Information Management System (RIMS)

A. Three years ago, Research developed RIMS to manage all aspects of research projects. It is a fairly complex system which monitors major milestones, tracks budget issues, compares results to goals, and generates certain standard contract documents (such as 173's).

B. As RIMS currently exists, project managers input data about once a year on individual project milestones. Then the Research support group uses RIMS to complete contracts, do budget exercises, monitor status, etc. The project managers have had some difficulty inputting project data (because they only do it once a year) but are getting better (since this is the third year). The support group, which uses the software frequently, has no serious problems with the software.

C. Eventually, Research plans for project managers to enter data more frequently than once a year.

D. Team members observed that RIMS is not really a project management tool. RIMS is more related to a tracking and reporting tool. RIMS apparently is used for fairly static projects which only need to be updated once a year. It is noted that individual project managers are requesting MS Project to manage their specific assignments.

Enclosure 3

DISCUSSIONS WITH IRM CONCERNING
PROJECT MANAGER SOFTWARE

I. Personnel contacted/areas discussed: Two personnel from IRM were contacted to discuss the office experience with the use of project management software and the costs associated with purchasing software. The following contains a summary of the discussions in each area.

II. Project Management Software

A. IRM has not specifically evaluated project manager software for generic application in the Agency, but is aware of a number of alternative project manager software packages. In general, IRM does not designate any software as the Agency standard for project management software. Obviously, based on discussions held with NRR (refer to enclosure 2), IRM will and has evaluated software for a specific application.

B. IRM is attempting to obtain write-ups from the vendors for software for four specific packages requested by the team: MS Project, Timeline, Harvard Project Manager, and Super Project Plus. These write ups have not been received as of 01/02/97.

II. Software Purchasing

The team was not able to contact the person responsible for obtaining large numbers of software packages. If NMSS decides to purchase a general license for the software, whoever negotiates the contract will need to work with IRM.

BACKGROUND INFORMATION

I. MS Project is recommended as the office-wide standard for project management software for the following reasons:

A. It is user friendly software. After a one-day introductory course, staff could immediately perform some basic project management functions, such as developing project plans and presentations in Gantt Chart format. The Atlas Project Manager was able to program the technical review for licensing of the site as well as the environmental review and use the program to calculate critical paths. As another example, the NFS Project Manager designed and input an NFS license renewal project in about 15 hours of effort. Both Project Managers now have a database that can be easily modified to plan future activities. Additionally, the contract trainer brought in to familiarize the team with MS Project was of the opinion that the software was the easiest to use and best of the currently available software packages available for project management. She also said the MS Project software was highly rated in the computer magazine evaluations.

B. It has many features for advanced users. It is flexible enough that both the novice and experienced user can gain benefit from the program.

C. NRR is planning on using MS Project as a baseline for planning and monitoring multiple projects. NMSS can learn from their experience. For example, in developing branch, division, and office level reports and perhaps in some aspects of contract management, it may be necessary to maintain data in some type of database management software (such as Microsoft Access or Ashton-Tate dBASE III Plus). In addition, much data is already stored in some type of data management software. But, almost none of the project management software will fully and easily transfer data back and forth with database management programs. Individual fields can be transferred fairly easily, but transferring linked fields is difficult. However, NRR is already working with a contractor developing a program to link MS Project with MS Access and we can gain from their experience.

D. In-house training for MS Project software is readily available. The Office of Personnel already has contract trainers capable of conducting training on MS Project and has the software installed on their training computers. All NMSS would need to do is to negotiate a schedule and level of detail for the training. The team would recommend a one day introductory course for staff and then more advanced classes as appropriate to learn about resource management capabilities and special reports.

E. A general license can be purchased to put the software on the LAN (this is probably true of the other packages as well but NRR has already obtained a general license for 50 people). However, group licenses generally do not provide a manual for every person. Although the software is relatively user friendly, a reference manual is necessary to facilitate use of the software at more than a fundamental level. If this option is chosen, it is recommended that after-market manuals (such as those published by the Que publishing company) be purchased for every person using the software. The cost of such manuals is roughly $30 per copy; but a bulk discount may be possible.

F. Microsoft Corporation is a major software developer with a reputation for transferring knowledge across its products. If a user is familiar with one Microsoft product, learning a second product is easier. In addition, Microsoft recognizes the popularity of its MS Project software and the desire to use software to track and monitor projects at a higher level. Recently, Microsoft distributed new software titled Team Manager 97, a project and team organizer which tracks and monitors workloads of individual employees and enables managers to assign tasks, set priorities, and establish deadlines. It differs from MS Project in that it emphasizes and integrates the workgroup and workflow aspects of tasks and goals. Team Management 97 is designed for the forthcoming Office 97 suite by Microsoft. If IRM chooses Microsoft as the standard office suite in the future, which is under consideration, NMSS may want to investigate Team Manager 97 further as a commercial off-the-shelf alternative to systems such as those under development by NRR.

II. Recommendations for improving project management within NMSS.

A. Project management science has been around for many years but the NRC does not use many aspects of this technology. To transfer from the current, almost ad-hoc, system to more traditional project management techniques for scheduling and resource management would require a change in the manner in which both the staff and management conduct business. Tracking and monitoring of existing projects is an appropriate first step. But ultimately the goal should be to implement proactive project management. Proactive project management requires real-time knowledge of resource expenditures versus time allotted for individual tasks and a system for management to immediately understand the impact of decisions on overall resources. To change the current mode of operation would require a significant and consistent commitment by management. Data collection, data entry, and acting on the revealed trends of project events should be a natural extension of the work and not a task perceived as collecting data solely to make reports for management.

B. As NRR has demonstrated (see enclosure 2), proper planning and scheduling can be a significant impact on staff resources, particularly the initial data input. Instead of having an outside group or a management group unilaterally decide what the overall structure of the project management tool should be, NMSS should start at the individual project level and work our way up the management chain in developing system requirements. Purchasing MS Project for project managers and some technical staff (say technical Section Leaders) may be a good first start. Based on actual data necessary to support the goals of each branch, decisions could be made about eventual roll-up of data for reports at the branch, division, and office level. Development of the roll-up reports will require the assistance of an outside contractor because of limitations in the software. Data entries designated as the minimum subset required to be entered must be diligently challenged to ensure that it is the absolute minimum data required. Once so designated, management needs to consistently require at least the minimum data be entered by all assigned personnel in a timely fashion.

C. NMSS should investigate further, perhaps by simply observing NRR's RPS system development, the connection between MS Access and MS Project. For some activities (perhaps contract management), Access may be the better tool for tracking and reporting status because dates are set values and project

management software tools are best used when dates are variables which can be manipulated by the software. If we can eventually shift back and forth with Access, MS Project could be used as a report generator for those activities. Conversely, we may need to evaluate the manner in which we currently manage contracts to see if we can better utilize the power of MS Project.

D. Management should consider sponsoring specific training, for both staff and management, on project management and actively ensure that the techniques taught in the course are used at the NRC.

1. This training should be directly related to the tasks assigned and taught in terms of actual projects managed by the NRC. Elements of this training should include: (1) how to define the elements of a project; (2) how to define the relationship among the elements -- which are dependent on others and which can be done in parallel; (3) how to identify and schedule resources to perform each element; (4) how to understand, determine, and track project costs; and (5) how to determine critical paths. There is somewhat of a perception in the staff that the NRC is not concerned with costs because it is not a business. This perception does not recognize that there are resource limitations which are, in effect, a cost limitation that should be understood and tracked.

2. There are several available courses, which if modified as described above, may possibly satisfy the training objectives. Two such courses are (1) the USDA Project Management Course, and (2) the Keptner-Trego Project Management Course (this is not the KT course currently taught at the NRC on decision making). August Spector, OP, is bringing the Keptner-Trego course to the NRC and roughly estimates that it could be done within existing training budgets at a cost of $15,000 per course or less. Dr. Spector's efforts in this area are related to, but totally independent from this team's efforts to evaluate project management software.