A MANAGERIAL APPROACH TO TRACKING STAFF ASSIGNMENTS
USING SAS/AF* AND SAS/FSP* SOFTWARE

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ABSTRACT
As any manager knows, keeping up to date on the progress of staff assignments is hopeless without using some organized approach to oversee that too many things aren't 'falling through the cracks'. This paper will describe a SAS/AF* menu driven application which tracked staff assignments in the Connecticut Department of Environmental Protection Air Compliance Unit.

The major features of this application include the use of SAS/FSP* PROC FSEDIT to input and update information pertaining to each individual assignment, the use of SAS/FSP* PROC FSLetter which enabled the Director to generate memos when new assignments were being issued or if returned assignments were considered incomplete, automatic generation of memos for assignments considered late based on assigned due dates, tracking of dates when the status of each assignment has been changed, and printing of various status reports and calendars which allow easy viewing of how the assigned due dates were distributed. In addition, because a number of groups within the Air Compliance Unit have already been automated using SAS* software, the Director could easily browse through their data sets containing the activity workload of each group for whatever up-to-date information he required.

INTRODUCTION
In 1985 the Connecticut Department of Environmental Protection (DEP) Air Compliance Unit (ACU) began implementation of an integrated Environmental Information System (EIS). In 1989 the DEP was reorganized and the Bureau of Air Management (BAM) was formed. The BAM includes the ACU and the Radiation and Noise Units. For the purposes of this discussion, the organizational structure that preceded the formation of the BAM i.e., the ACU, will be used since the subject software was developed for use by the ACU and its Director. This software can be easily modified to work in the new BAM organizational environment if so desired.

The EIS was designed to handle most of the Administrative, Technical and Air Quality data handling needs of the ACU (see Figure 1). The Technical and Air Quality components of the EIS were first developed. It then became apparent that computerization of the management activities to administer the ACU programs could easily be incorporated. While only a small portion of the Air Quality component was written in SAS software, both the entire Technical and Administrative components were written in SAS software Version 5.18 and run in a Data General Corporation AOS/VS computer environment.

In August, 1987 a comprehensive Task Tracking Information System (TTIS) was implemented (Figure 1). The purpose of the TTIS was to document each assignment issued by the Commissioner of the Department of Environmental Protection or the Deputy Commissioner of Environmental Quality to the ACU as well as each assignment issued by the ACU Director to the staff of the ACU. In addition, once any assignment was recorded, its progress toward completion could be tracked using a series of activity status fields (e.g., received, active, on-going, under review, late, complete). The date that each status was initiated was also recorded so a time history of the assignment could be developed. A variety of reports summarizing the data were also available to the user. Overall, this system was intended to improve efficiency and performance of the ACU's efforts to meet its statutory responsibilities to the people of Connecticut.

As it was the responsibility of the ACU Director to manage all of the ACU State and Federally funded programs, a majority of the assignments were recorded by and issued from the Office of the Director using the TTIS TASKS subsystem. In some cases, such as applications for permits to construct and operate sources of air pollution, the tasks were initiated by the Enforcement Control Group and then tracked by the Director's Office in the PERMITS subsystem. A MODELING subsystem, to track ambient impact modeling analyses, and a STATE ORDER subsystem, to track ACU Enforcement activities, were other modules contained in this system.

Typically, there were from 250 to 300 active tasks being tracked in the TASKS subsystem, from 200 to 250 active tasks being tracked in the PERMITS subsystem, some 150 to 230 active tasks being tracked in the STATE ORDER subsystem, and about 20 active tasks being tracked in the MODELING subsystem at any one time.

USING THE SYSTEM
The computer software package used to develop and run the TTIS is licensed from SAS Institute, Inc. To start the TTIS menu driven computer application, the user would type in the command 'TASKS' at the AOS/VS Command Line. An initial prompt on their terminal. This command invoked the SAS/FSP software using 'PROC DISPLAY'. The first screen that was brought up on the terminal was a master menu identifying the subsystems (see Figure 2) of the TTIS. To enter the TASKS subsystem, the user would type '1' on the 'Select Option' line. At this point a second screen appeared listing the operations available in the TASKS subsystem (see Figure 3). Options 1, 3, and 4 of this screen concerned editing and viewing the active and completed assignments. Option 2 contained all of the reports available to the user.

To edit on-going assignments and issue new assignments, the user would choose Option 1. The SAS program would then bring up a customized SAS/FSP software editing screen showing information about each assignment (see Figure 4). The variables contained in each record include: due date, name of the person responsible for the task; the status of the task; the status date; the status number; the task priority; the log number; the issue date; a short description of the task; comments; the estimated number of hours associated with each task; and the estimated cost of each task. The user could then type '1' to the 'Select Option' line. At this point a second screen appeared listing the operations available in the TASKS subsystem (see Figure 5). This data matrix is similar to the EIS PERMITS subsystem where up to 10 layers of data can be stored. This allowed the status to change back and forth according to need up to 10 times while tracing the time elapsed at each status. Also, since the assignments were prioritized, any changes in due dates could be traced.

Before ending the editing session, the user may want to prepare intraoffice memos to the staff concerned with their assignments. By typing in 'FORM' and 'SEND' commands on the FSEDIT 'Command Line', the SAS program will bring up one of several form memos which could then be completed and printed out on a laser printer. It should be pointed out that, although additional comments could be added at the bottom of each form memo, the SAS software package does not have the ability to save the comments by adding them to the dataset file.

At the end of each editing session, the SAS program processed
the newly edited data by running a standard record-keeping routine which stored new status dates, called out completed records and made available the updated files to the appropriate supervisors (this last step is included because all the supervisors were able to view their assignments independently). Using conditional IF statements, the program code first located the last date filled into the status date matrix, then it compared whether the new status indicated forward progress or back tracking in the task review. If forward progress was found, then the new status date was stored in the corresponding status date field. If back tracking had occurred, then the code forced a shift in matrix columns and stored the date in that status date field. This prohibited an original date for the same status from being over written, thereby showing a complete history of the task's status activity. Figure 5 shows an example of both progressive (column 1) and back tracking (shifts to columns 2 and 3).

An important automatic feature of the TTIS package was that it had the capability to generate intraoffice form memos whenever a task was found to be, 7, 14, 30 or 90 days past its due date. Four individual memos were designed into the system to accommodate varying degrees of urgency that a task was not being addressed. For example, if a task was 7 days past due, the form memo stated this fact and requested the staff to respond to completion of the task or to request an extension of the due date. Assuming this late memo was responded to, the task was either given a new due date or it was considered complete. If no response to the late memo was received, after 14 days a second late memo was generated asking for the task to be addressed. If no response was forthcoming after 30 days, the late memo generated expressed the Director's urgency that the task must be addressed as soon as possible. Similarly, at 90 days actions to be taken by the Director with regard to the specific task were expressed in memo form. For each late memo generated, the SAS program stored the appropriate dates in the date matrix and outputted a notation to that task's comment section thereby developing a history of activity concerning the progress of the task, e.g., see 02/22/90 reference on Figures 5 and 6.

The other modules of the TTIS were the PERMITS, MODELING, and STATE ORDER subsystems. These three subsystems can be discussed simultaneously because they were tracked by the Office of the Director in a similar manner. A majority of the PERMITS and STATE ORDER subsystem assignments were initiated by the Administrative Enforcement/New Source Review (AE/NSR) Section. Also, since the AE/NSR Section made requests of the Technical Services Modeling Group to perform ambient impact modeling, a majority of the MODELING subsystem assignments were initiated by the AE/NSR Section. For example, when a permit application was received, a new record was entered in the Permit Subsystem of the EIS. If the engineer processing the permit determined that modeling was necessary, then a modeling request was made by the AE/NSR and a new record was entered in the Modeling Subsystem of the EIS.

When the Director wished to see the active permit assignments, he would select option 2 of the Master Menu (Figure 2). The TTIS PERMITS subsystem program would then retrieve the latest information from the EIS Permit Subsystem and update the last known information the PERMITS subsystem had on the permit assignments. Likewise, when the Director requested to see the active modeling or active state order assignments (Option 3), the TTIS retrieved the latest information from the EIS Modeling or State Order Subsystems (see Figure 7). The intent of these three subsystems was to keep the Director up to date on the progress of those tasks. After choosing one of the subsystems, a second screen would come up allowing the Director to edit either his active or completed files of the subsystem he was in or to print out one or more reports from that subsystem.

When editing of the Permit file was requested, customized FEDIT screens similar to those shown in Figures 4, 5 and 6 were used. In each case only a few variables from each EIS subsystem (enough to identify the particular tasks and their data matrices) were copied into the Director's tracking data sets. The first of the Permit screens described the permit application being reviewed and the reviewing engineer's progress to date. The second, third, and fourth screens are used by the Director and the fifth screen showed the permit status data matrix. Editing of the Modeling files were similar except that the Modeling Group's tasks were divided into two groups (DEP modeling and Applicant modeling). The required use of an intermediate menu to select the desired group of screens. When reports concerning these files were needed, the Director would choose that option from either menu.

The MODELING subsystem contained one additional feature which allowed the Director to issue the modeling requests initiated by the AE/NSR Section. This feature was necessary because the electronic transfer of data between the EIS Permit and Modeling Subsystems were much quicker than the associated paperwork being transferred from AE/NSR Section to Technical Services (see Figure 8). When the Director received a memo from AE/NSR Section requesting that a modeling analysis be performed, he would choose Option 4 on the TTIS MODELING menu. This action brought up a holding bin of data files containing the requests recently made by the AE/NSR Section. He could then locate the record which matched the memo, release the electronic record by typing in the Issue Date of the memo and forward the memo to the Technical Services Modeling Group. Once released, that record was sent to the EIS Modeling Subsystem making it available to the Modeling Group.

Within each of the TTIS modules there were a variety of reports which could be selected. Generally, the reports included status summaries of active tasks, listings of tasks which were late or incomplete, listings of completed tasks, and PROC CALENDAR printouts of tasks by 'Due Date' (see Figure 9).

**CONCLUSIONS**

Prior to the development of the TTIS, the Director of the ACU delegated tasks to the staff thru a variety of media including intraoffice memos, directives stated at meetings, telephone conversations, and casual visits to staff workstations. Many of these tasks were completed on a timely basis, but there seemed to be a percentage that were consistently on 'back burners' or forgotten altogether. The TTIS was an effort to better organize the ACU's activities by formalizing both the identification of tasks and the communications needed to succeed in completion of the ACU's active workload.

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* SAS, SAS/AF, and SAS/FRP are registered trademarks of SAS Institute, Inc., Cary, NC, USA.
Figure 1
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION
AIR COMPLIANCE UNIT
INTEGRATED ENVIRONMENTAL INFORMATION SYSTEM (EISI
PURCHASING AND BUDGET SYSTEM
ADMINISTRATIVE COMPONENT
TECHNICAL COMPONENT
AIR QUALITY COMPONENT
PURCHASING AND BUDGET SYSTEM
TASK TRACKING SYSTEM

Figure 2
MASTER MENU

1. GENERAL SUBSYSTEM
2. PERMITS SUBSYSTEM
3. MODEL SUBSYSTEM
4. ENFORCEMENT SUBSYSTEM
5. FIELD INSPECTION SUBSYSTEM (Future)
6. STACK TESTING SUBSYSTEM (Future)

Figure 3
GENERAL TASK TRACKING
MASTER MENU

1. EDIT ACTIVE TASKS
2. PRINT REPORTS
3. VIEW ACTIVE TASK LOG
4. EDIT COMPLETED TASKS

Figure 4
EDIT GENERAL TASKS DATA SET

SCREEN 1
DUE DATE: 03/15/90 NEW DATE (Y/N): NAME: W. SIMPSON
STATUS: ACTIVE PRIORITY: 3 CABINET ID:
STATUS UPDATE: 02/24/90 NEW STATUS (Y/N):
LOG NUMBER: WFS-12 DATE ISSUED: 01/05/90
ASSIGNMENT: PREPARE USER GUIDE
COMMENTS: MEET WITH USER GROUP TO OUTLINE SYSTEM
GRANT NUMBER: ESTIMATED MAN HOURS: 15
DATE COMPLETED: ACTUAL MAN HOURS:

Figure 5
EDIT GENERAL TASKS DATA SET

SCREEN 2
NAME: WFS TASK: PREPARE USERS GUIDE
DATE: COMMENTS:
02/04/90 RETURNED TO INCLUDE MORE FLOW CHARTS
02/22/90 FIRST LATE MEMO SENT
02/24/90 REQUEST FOR EXTENSION OF DUE DATE GRANTED

Figure 6
EDIT GENERAL TASKS DATA SET

SCREEN 5
STATUS DATA TRACKING MATRIX:
ACTIVE 01/05/90 02/05/90 02/24/90
LATE 02/22/90
UNDER REVIEW 02/01/90
INCOMPLETE 02/04/90
COMPLETE 03/10/90
DUE DATE 02/15/90 03/15/90

1484
Figure 7
EDIT ACTIVE PERMIT TASKS

Figure 8
PERMIT MODELING REQUEST PROCESSING

Figure 9
GENERAL TASK PRINT PROGRAM

CHOOSE ONE OR MORE BY TYPING 'Y':

- STATUS REPORT SORTED BY PERSON AND DUE DATE
- GRANT RELATED TASKS
- LATE TASKS
- COMPLETED TASKS
- CALENDAR OF TASKS' DUE DATES

CHOOSE A PRINTER:  A  B  C