

**TRACKING AIR COMPLIANCE PERMIT REVIEWS
USING SAS/AF* SOFTWARE
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INTRODUCTION

The Connecticut Department of Environmental Protection (DEP) Air Compliance Unit (ACU) has implemented a comprehensive, integrated Environmental Information System known as the EIS. The EIS is comprised of three (3) components – an Administrative Component, an Air Quality Component and a Technical Component. The EIS Administrative Component contains Task Tracking and Purchase Request/Budget Subsystems. The Air Quality Component contains an Air Quality Data Acquisition and Handling Subsystem. This Component handles all ambient air quality data as well as meteorological data collected at monitoring locations throughout the State. It operates on both a real-time basis as well as storing data for quality assurance editing and archiving. The Technical Component includes a Permit Review Subsystem, an Emissions Inventory Subsystem, Enforcement Compliance Subsystems, a Superfund Amendments and Reauthorization Act of 1986 (SARA) Right-to-know Subsystem and finally a Toxic Information Subsystem. The Emissions Inventory Subsystem is used to maintain a Statewide point and area source emissions inventory. The Enforcement Compliance Subsystems process all Notices of Violations, State Orders, and Civil Penalties issued by the ACU. The SARA Subsystem databases the Federally required hazardous materials information. The Toxic Information Subsystem contains toxic chemical information used by the ACU in conjunction with a comprehensive set of toxic regulations adopted by the State legislature in 1986. The ACU also maintains a database of almost ten thousand chemical synonyms and trade names. An outline of the ACU's EIS is presented in Figure 1.

All of these information systems (except for the real-time portion of the Air Quality Component) currently reside on the ACU's Data General (DG) AOS/VS Eclipse* MV/10000 mini-computer system. In 1987 the ACU installed a DG MV/15000 mini-computer alongside the MV/10000. For now the MV/15000 is only processing the real-time portion of the Air Quality Component. It is planned that upgrading the MV/15000 will allow it to accept more of the data processing load of the ACU.

All of these information systems are user friendly menu driven modules written in Version 5.04 base SAS*, SAS/AF*, SAS/FSP*, and SAS/OR* and include conversion programs used to interface with a number of EPA approved packages which must be run for EPA national database purposes. This paper will examine the Permit Review Subsystem which the ACU New Source Review Group uses to process applications for Permits to Construct and Operate new sources of air pollution as defined in the *Regulations of the Connecticut Department of Environmental Protection Concerning the Abatement of Air Pollution* (i.e., the *Air Regulations*).

BACKGROUND

The Technical Component of the EIS contains a number of databases which can be linked together to produce any number of data files containing specifically requested information from each major subsystem. The primary keys which are used to merge data from these subsystems are common identifiers known as the client, town, premise, and sequence numbers. The ACU Technical Services Section has been delegated the task of assigning keys, for use in all files, to ensure a unique identification of each record. Each subsystem is comprised of one or more files which are linked together by their own unique secondary keys.

Future information systems developed by other line Units within the Division of Environmental Quality (EQ) of DEP will be required to

contain the aforementioned identifiers so that data can be merged into a common EQ Information System for whatever purposes desired (e.g., when deciding whether to grant a particular company an air pollution construction permit, the Commissioner may want to see whether the DEP has any outstanding enforcement actions against this company for violations of other environmental statutes or regulations; this can be accomplished by merging the enforcement compliance history files of the appropriate line Units).

The Permit Review Subsystem (see Figure 2) contains information on those sources which were constructed after June, 1972 and, according to the *Air Regulations* were required to obtain ACU construction and operating permits from the DEP. Sources in existence in 1972 were not required to obtain permits but had to be registered with the DEP. These registered sources make up the bulk of the Emissions Inventory Subsystem point source dataset. Whether permitted or registered, all sources still must comply with all other portions of the *Air Regulations*.

As of June, 1987 the review of each permit application submitted by a Connecticut business is tracked by a Permit Engineer using the Permit Review Subsystem. The permit dataset contains information relating to all environmental aspects of a stationary source's operation including operating restrictions and other limitations placed upon a source as conditions for obtaining a permit. The permit dataset contains the client, town, premise, and sequence numbers. In addition the ACU New Source Review Group uses an 'EPE' log number which is assigned to the permit application when it is first submitted by a company. The 'EPE' log number is used as a secondary key by the New Source Review Group in the Permit Review Subsystem. Creation of a new observation on the permit dataset is performed by a data entry person who types in basic information about the company and the source to be reviewed, the 'EPE' number and the initials of the permit engineer assigned to review the application.

Each permit engineer's SAS/AF module calls up his/her own dataset of permit applications. Each permit engineer is responsible for processing between 25 and 45 permit applications at any one time. Although it might have been more convenient to keep all active data in one large dataset, Version 5.04 SAS software is restricted to allowing one user to edit a dataset at a time. Because of this limitation, it is necessary to run a master processing program overnight which merges the individual engineer's datasets into one, performs standardized record keeping routines on the merged dataset, and then redistributes the data records back to the individual permit engineer's datasets.

INTERACTIVE OPERATION

To begin the menu driven Permit Review Subsystem the engineer would type in the command 'UPDATE'. Before entering the master menu some housekeeping items are addressed. A listing of rejected requests for 'completed' observations and any observations containing duplicate 'EPE' log numbers on the master dataset (from the overnight processing discussed below) appears on the user's screen. This procedure alerts the user that one or more of his/her 'completed' observations were rejected due to missing data in a required field. Also, over time we have found that manipulating observations by the users have on occasion resulted in more than one observation containing the same 'EPE' log number. Since it is important that each record's 'EPE' log number remain unique, this second listing alerts the users to any duplication of 'EPE' log number.

Immediately following these listings a 'Master Menu' of options appears on the screen for the engineer. The major options from this Master Menu include: updating the 'active' application dataset; browsing the completed dataset; updating a correspondence log; processing a Best Available Control Technology/Lowest Achievable Emission Rate (BACT/LAER) report; and printing a report (several are available - status, summary, toxic, detailed). After choosing one of these major options a second screen usually appears asking for a more specific request (e.g. choose one or more of 8 possible reports). Typically the engineer would choose to update one or more of his/her active permit applications. After this selection is made their 'active' dataset is brought up in PROC FSEDIT for editing using 10 customized screens per observation. Figure 3 shows the first two data entry screens used in the Permit Subsystem. These two screens are concerned with administrative information while screens 3 through 10 cover stack parameters, control system parameters, operating parameters, maximum allowable emission limits, emission factors, and annual emission rates. Ten screens are required per observation because each one consists of over 500 data fields.

Depending on the type and size of the source being reviewed, the permit engineer may have to request information and approvals from other groups within the ACU. One important step is the approval of the source's emission impacts from the ACU Technical Services Modeling Group. Once the permit engineer has assessed the stack emissions expected from a source, he/she would prepare a memorandum requesting that an Ambient Air Quality Impact Review be performed by the Modeling Group. The preparation of this request memo is handled by the SAS program as follows. After the permit engineer sets the permit review status to 'TM' (standing for 'To Modeling') and ends his/her editing session of the active dataset, the SAS program searches for any records with a 'TM' status and brings them up in PROC FSEDIT on a second set of screens customized for the preparation of the modeling request. The information requested by these screens is filled in by the permit engineer. Any data needed for the Modeling request which was input by the permit engineer on the original 10 screens are carried over to these modeling request screens thereby minimizing duplication of effort. Once this is done the SAS program writes a custom report using this information and has the memo printed out on a laser printer. The memo is picked up by the permit engineer, any supplemental information, such as a plot plan, is attached and the memo is sent to his/her supervisor for approval and submittal to the Modeling Group (see Figure 4).

Immediately after the memo is prepared the SAS program stores the modeling information supplied by the permit engineer in a 'holding bin' dataset. Because the memo request approval typically takes 3 to 5 days (longer if questions arise), this holding bin allows the electronic transfer of data to the Modeling Group to keep pace with the memo. Only after the ACU Director has reviewed the request memo and approved it does the electronic record reach the ACU Modeling Group for use in their tracking system. The approval release is performed by the Director who calls up the holding bin dataset, finds the observation to be approved, and inputs the 'issue' date - releasing that record for the Modeling Group. It is anticipated that this process of automating memo requests will also be used with respect to source inspection requests from the ACU Permit Review Group in the future.

Another aspect of the permit engineer's review is to determine that there are no excessive ambient impacts of any toxic substances which may be used by the company's proposed source. By selecting another option through the menu system the engineer can bring up a PROC FSEDIT custom screen which concerns toxics. By inputting the requested data for each type of toxic substance involved in the review, the necessary calculations are performed after exiting the PROC FSEDIT screen. If the results are unacceptable, the permit engineer can do an iterative series of calculations by re-entering PROC FSEDIT to determine a scenario which would yield acceptable results.

In the case where a Best Available Control Technology/Lowest Achievable Emission Rate (BACT/LAER) report must be submitted to the EPA BACT/LAER Clearinghouse, the permit engineer chooses that option from the Master Menu. The SAS program prompts the engineer for the 'EPE' log number of the permit the engineer wants to report. After the request is made, the record is brought up on a PROC FSEDIT custom screen designed to meet the reporting requirements of EPA BACT/LAER. Assuming most of the information had been entered on the 10 screens regularly used by the permit engineer, that information is automatically brought into the BACT/LAER custom PROC FSEDIT screen. Therefore, only new information must be typed in to complete the screen. When this is done the SAS program prepares a custom report and the report is printed on a laser printer, much the same as the modeling request memo.

Another option on the Master Menu allows the permit engineer to create observations through PROC FSEDIT on all correspondence concerning each permit review being performed. This dataset contains the 'EPE' log number, the permit engineer's initials, the correspondents' names (to/from), and the date and subject of the letter.

The *Air Regulations* require that two permits be obtained from the ACU for each new source being installed. Although the bulk of the permit review is performed by the permit engineer for the first permit - the Permit to Construct, each new source must be reviewed for operational compliance with the *Air Regulations* in order for it to obtain a Permit to Operate. Therefore, the permit engineer has the ability to recall the Permit to Construct information from his/her archive dataset of completed reviews. If the permit in question is not available from the archive dataset (since this system only began in June, 1987), the permit engineer then has the option to search through the statewide Point Source Emissions Inventory (which has been in existence since 1972) and recall that information. Again, this ability reduces duplication of effort by staff members and points out the importance of having common key identifiers among the various datasets maintained in the DEP.

The permit engineer can request several types of reports ranging from full PROC PRINT detail reports for the active, toxic, and correspondence datasets to PROC PRINT reports showing the activity summaries for each permit engineer's active observations (see Figure 5). Another report is generated using SAS/OR showing a Gantt chart of the time elapsed during each stage of the permit review (see Figure 6).

OVERNIGHT PROCESSING

The following is a summary of what occurs in the overnight processing (refer to Figure 7). First, the SAS program merges all of the individual permit engineers' datasets into respective master datasets (e.g. a master 'active' dataset, a master 'complete' dataset, etc.). Then, all the observations in the merged 'active' dataset are scanned to see if a new status has been set by a permit engineer. During the course of a permit review there could be up to 12 distinct status changes made by the permit engineer. The statuses include 'Received', 'Incomplete', 'Complete/Notified', 'Approved/Notified', 'To Modeling', 'From Modeling', 'To Inspection', 'From Inspection', 'Card Drafted', 'Proposed Decision', 'Final Decision', and 'Complete/Filed'. A majority of these statuses key off time periods built into the *Air Regulations*. For example, the *Air Regulations* state the DEP is required to notify the applicant that the application is considered complete (i.e., all necessary information was supplied) within 45 days after receipt of the application. If a status change occurs, the date of the status change is recorded. The program has the ability to store status dates up to 5 layers deep (in case the permit review must be backed up several steps, the second, third, or fourth times the same status is reached, the new status data will be saved along with the old dates). This helps track the overall history of the permit review (see Figure 8).

When the 'Approved/Notified' status is reached (signifying that the permit engineer approves the application as having all the information needed to proceed with the review), a copy of that permit observation is sent to the ACU Technical Services Group in the form of a transaction dataset to make them aware that a new source is in the process of obtaining a permit. This initial notification is used by the ACU Technical Services Group for their ambient impact modeling reviews. Any observations which have been determined 'Complete' are checked by a quality assurance program to verify that all required fields have been filled in before the complete status is accepted. If data is found missing, a report is printed out explaining which fields were empty in that observation and the observation is kept in the engineer's active dataset (see Figure 9). If the completed record passes the quality assurance data check then the observation is culled out of the active dataset and archived in the permit engineer's complete dataset. This keeps the permit engineer's dataset up to date by keeping only active observations. A transaction dataset of the completed permit observations is also sent to the ACU Technical Services Group and the ACU Field Enforcement Group so that the new sources can be added to their respective databases. For all the active permit reviews an activity status report is generated for use by the engineers and their supervisor. Also a file is prepared for producing a SAS/OR Gantt chart for each permit review. Gantt charts are used to show the length of time the permit was at each review status. At the conclusion of processing the previous days changes to the data and updating of the various status reports, the final step of the overnight processing is to 'break

out' the individual engineer's datasets from the master datasets for use the next workday. Since this separation of data is done according to the engineer's initials stored on each observation, an added feature is that re-assignments of a permit review from one engineer to another is easily accomplished by changing the engineer's initials the day before.

CONCLUSION

Implementation of this comprehensive system of SAS programs known as the Permit Review Subsystem by the ACU has made the review of permit applications much more structured and consistent. Supervisors are realizing better planning capabilities and reduction in backlog, better accountability, and accuracy of data collected. This same approach is being used in other ACU Groups with similar SAS. It is hoped that more ACU activities can be handled using SAS.

ACKNOWLEDGEMENTS

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* SAS, SAS/FSP, SAS/AF, and SAS/OR are registered trademarks of SAS Institute Inc. Cary, NC, USA. AOS/VS ECLIPSE MV/10000 and MV/15000 are registered trademarks of Data General Corp.

FIGURE 1
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION
AIR COMPLIANCE UNIT
INTEGRATED ENVIRONMENTAL INFORMATION SYSTEM (EIS)

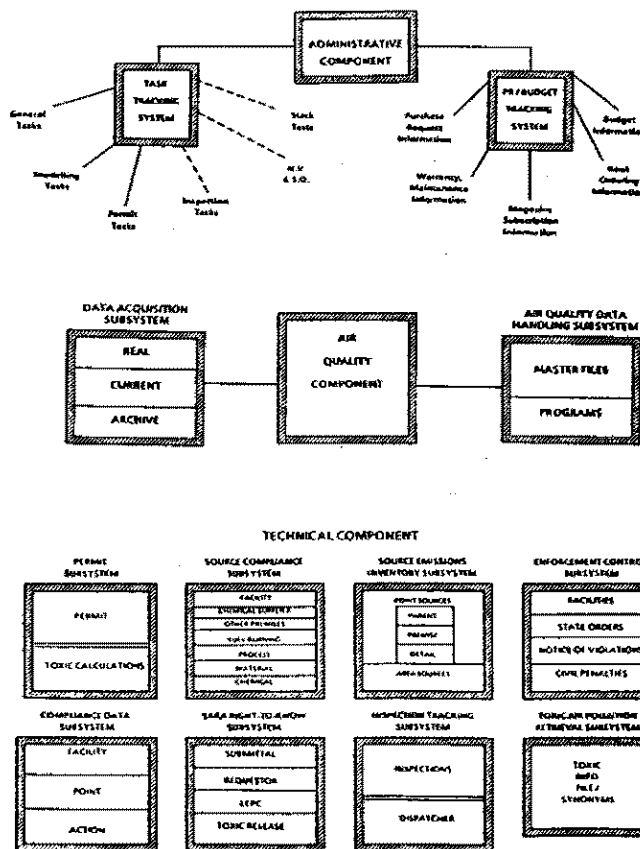


FIGURE 2

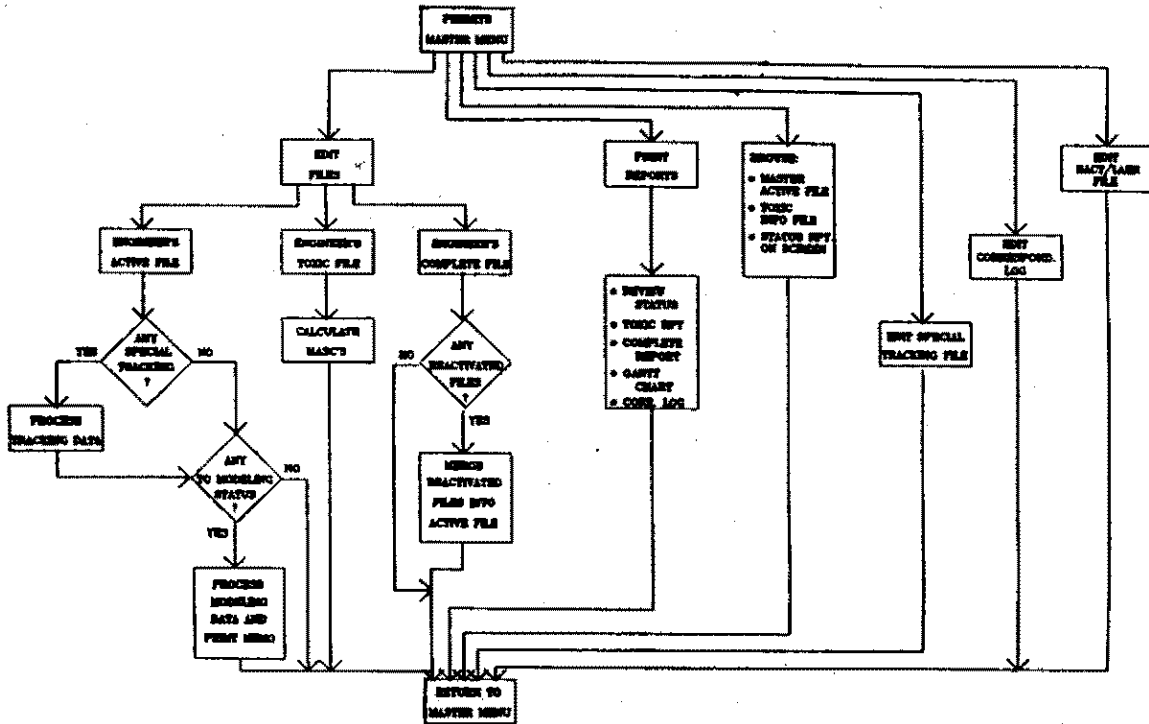


FIGURE 3
PERMIT SUBSYSTEM USER SCREEN

Edit SAS data set: PER.ACTIVE Screen 1
 New 26

Company #: _____ CLIENT: _____ SEQUENCE: _____ TERM: _____
 PREMISE: _____ PERMIT: _____ STACK: _____

REVISOR: _____ S.O. #: _____
 M.V. #: _____ FEE: _____

COMPANY NAME: _____
 COMPANY STREET: _____
 COMPANY TOWN: _____ ST: _____ ZIP: _____
 PREMISE STREET: _____ PREMISE TOWN: _____

SOURCE DESCRIPTION: _____ TANK CAPACITY(GAL): _____

CATEGORY: _____ (B = BOILER, C = DIESEL/PURBINE, S = INCINERATOR,
 P = PROCESS OR HOT MIX ASPHALT PLANT)

CONTACT: _____ TITLE: _____ PHONE: (____) _____

OWNER CODE: _____ (USE 1ST INITIAL - FEDERAL, STATE, LOCOM, PRIVATE, UTILITY)

APPLICATION DATE (MMDDYY): _____ ISSUE DATE: _____ EXPIRE DATE: _____
 COMMENCE CONSTRUCTION DATE (MMDDYY): _____ COMPLETED DATE: _____
 APPLY FOR PERMIT TO OPERATE DATE (MMDDYY): _____ COMPLETED DATE: _____
 STARTUP DATE (MMDDYY): _____

Screen 2
 New 26

PERMIT TYPE: _____ (CP - CONSTRUCTION OP - OPERATING (_____)
 CP/OP - CONSTRUCT/OPERATE SCP - CONSTRUCT RENEWAL
 MOD - MODIFICATION TOP - TEMPORARY OPERATE
 ISP - INDIRECT SOURCE TAX - TAX SET - SET VAR - VARIANCE)

PERMIT STATUS: _____ (2 - RECEIVED 1 - INCOMPLETE
 CN - COMPLETE NOTIFIED AP - NOTIFIED APPROVED
 TI - TO MODELING FI - FROM MODELING DC - CARD DRAFTED
 T1 - TO INSPECTION FI - FROM INSPECTION O - OTHER
 PD - PROPOSED DECISION FD - FINAL DECISION C - COMPLETE/FILED)

SPECIAL STATUS: _____ (CALL IN IF 'PERMIT STATUS' - OTHER)
 (S - STACK TEST REQUIRED ID - INTERNAL DECISION
 SO - STATE ORDER D - DENIED W - WITHDRAWN
 E - EXEMPTION P - PENDING FEDERAL APPROVAL)

PERMIT STATUS DATE (MMDDYY): _____ IS THIS A NEW STATUS? (Y/N): _____
 ANY SPECIAL REQUIREMENTS (E.O. CON PLAN, STACK TEST) TO BE MET? (Y OR BLANK): _____

SPECIAL CONSIDERATIONS: _____ (4 = OSM, CONVERSION, 6 = PSD, 2 = RESUMPS, 9 = NSPS)
 STANDBY PLAN: _____ (1 = NO, 2 = YES) CONFIDENTIAL: _____ (1 = YES, 2 = NO)

FIGURE 4
MODELING REQUEST

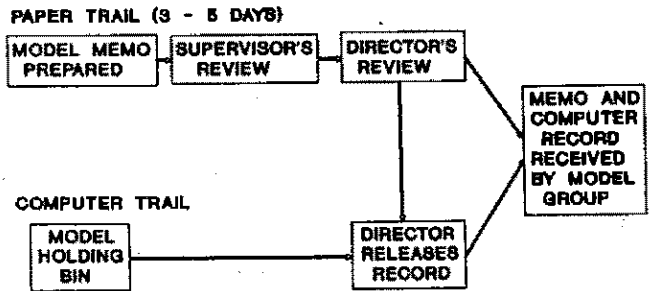


FIGURE 5
STATUS OF ACTIVE PERMITS

ENGINEER-ARM

APPLICANT	DESCRIPTION	EPE N.M.	APPL DATE	TYPE	R	I	C	N	A	P	T	M	F	M	D	C	P	D	FD	UP_DATE	
Addario Co.	Storage Tank	15818	03/31/78	OP	X	-	-	-	-	-	-	-	-	-	X	-	-	-	-	02/01/89	E
AmeryWay	Tenler Frame	15962	11/20/88	CP	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	02/19/88	
Hest Manag	Flare hndt-18	16388	04/11/88	CP	X	X	X	-	-	-	-	-	-	X	X	X	X	X	X	09/15/89	E
Wale Hoapl	Boiler	16382	04/25/88	OP	X	-	X	-	-	-	-	-	-	X	X	-	-	-	-	12/12/88	
Wale Hoapl	Emerg. Diesel	16353	04/25/88	OP	X	-	X	-	-	-	-	-	-	X	X	-	-	-	-	12/12/88	
Wale Hoapl	Emerg. Diesel	16354	04/25/88	OP	X	-	X	-	-	-	-	-	-	X	X	-	-	-	-	12/12/88	
Wale Hoapl	Emerg. Diesel	16367	04/25/88	OP	X	-	X	-	-	-	-	-	-	X	X	-	-	-	-	12/12/88	

FIGURE 5
REVIEW OF THE OHIO & SONS CO. APPLICATION
FOR A PERMIT TO CONSTRUCT
 THE PERMIT NUMBER IS 131 - 001 THE EPE NUMBER IS 9629

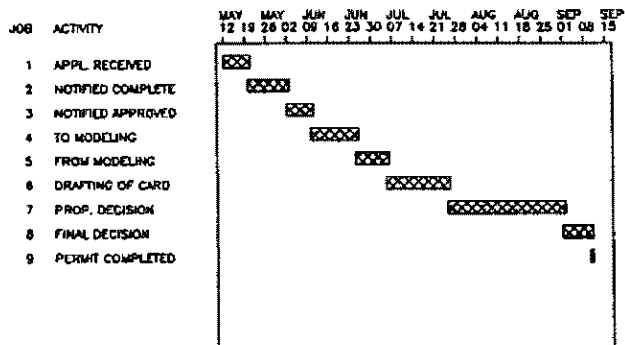


FIGURE 7
OVERNIGHT PROCESSING

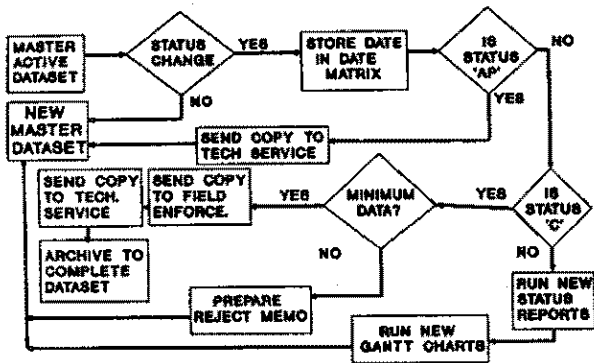


FIGURE 8

ON THIS SCREEN IS A LISTING OF THE STATUS DATES STORED BY THE 'UPDATE' PROGRAM AS YOU RECORDED THEM ON SCREEN 2 DURING THE REVIEW OF THIS PERMIT APPLICATION.

RECEIVED	02/24/88			
INCOMPLETE				
COMPLETE/MOTIFIED	02/01/88			
APPROVED/MOTIFIED	03/12/88			
TO MODELING	04/15/88	05/02/88		
FROM MODELING	05/02/88	05/24/88		
TO INSPECTION			06/16/88	
FROM INSPECTION			07/22/88	
CARD DRAFTED		08/13/88		
OTHER-STACK TEST				
OTHER-INTERNAL DECISION				
OTHER-STATE ORDER				
OTHER-DENIED				
OTHER-WITHDRAWN				
OTHER-EXEMPT				
OTHER-PEND. FEED. APPR.				
PROPOSED DECISION			08/03/88	
FINAL DECISION			09/10/88	
PERMIT COMPLETE			09/25/88	

FIGURE 9
 INTEROFFICE MEMORANDUM

MARCH 1, 1988

TO: PERMITS SUPERVISOR

FROM: MW10000 OVERNIGHT SERVICES

RE: INCOMPLETE REPORTS BEING ASSIGNED COMPLETE STATUS BY PERMIT ENGINEERS

THE FOLLOWING PERMITS WERE GIVEN A COMPLETED STATUS BY AN ENGINEER APPARENTLY WITHOUT MINIMUM DATA BEING CODED FOR THAT PERMIT. THEREFORE, THESE PERMITS HAVE BEEN RETURNED TO THE ENGINEER FOR FURTHER REVIEW.

EPE_NUM	NAME	DESCRIPTION	MISSING VARIABLE	END
18322	FLEXICAL CONST.	#1 OXATER THERM. OXIDIZER	STACK TEMPERATURE	JAC
18414	OHIO & SONS CO.	WEB OFFSET PRINTING PRESS	THRUPT WEIGHT/YEAR	ARM
18414	OHIO & SONS CO.	WEB OFFSET PRINTING PRESS	STACK HEIGHT	ARM