EPA SYSTEM PROFILE

FINAL REVISION I

PCS

Prepared for

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL DATA PROCESSING DIVISION

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PCS PROFILE

OUTLINE

1.0   System Overview

1.1   System Purpose

The purpose of the Permit Compliance System (PCS) is to track and monitor over 130,000 industrial and public works facilities in support of the National Pollutant Discharge Elimination System (NPDES). PCS tracks permit information issuance through expiration as well as additional data including : general permit information, government grants issued; appeals and hearing requested by the permittees and facility inspection data.

1.2   System Background

PCS was developed under the Office of Water Enforcement and Permits (OWEP) to support NPDES. The NPDES issues permits to facilities discharging pollutants into our nation's waterways. Each permit limits the amount of pollutants a facility may legally discharge. Actual measurement limits, for pollutants and beneficial elements are specified on a permit. Maximal limits are indicated for acceptable levels of a pollutant. Minimum limits are indicated for the minimal amount of beneficial elements that are required, such as oxygen.

One of the major functions of the NPDES program is to determine which facilities violate permit regulations. Depending upon the severity of the violations, action may be taken by the EPA to insure future compliance. These "enforcement actions" that the EPA issues may appear in many forms. The actions taken become more severe as the violations continue.

Another important aspect of the NPDES program concerns the maintenance of discharge limits on existing permits as a result of new laws requiring stricter regulation. These new laws may require revisions to existing permits, resulting in pollution discharge limits being lowered or raised significantly. The revised permit may contain instructions to build new filtering plants to comply with new regulations. If this is necessary the EPA will set a time schedule with completion date milestones for building new plants. These "compliance schedules" must be met within the time frame specified or enforcement actions will be applied.

Many reports are required by Congress to identify NPDES violators and the accompanying enforcement actions taken by the EPA. Both state and regional EPA employees use PCS as a tool to determine who is violating the Clean Water Act, to what extent,

and what prior action has been taken.

2.0   User Environment

The user community consists of the state and regional employees needing NPDES program information. Each regional office is responsible for their designated states. However, regions may contain interface states, who have developed their own tracking and compliance systems. Interface states must supply required NPDES information to the PCS data base (typically via a batch upload process).

User personnel include data entry operators, engineers, and managers. Engineers enter and access PCS inspection information, and managers monitor PCS for quality control purposes.

Contractors are employed to create and run retrieval requests.

2.1   User Support

A representative users group meets twice a year with Headquarters staff and technical staff to discuss PCS issues. The forum for these user conferences includes discussion of new policy decisions, and present and future enhancements. These conferences are attended on a volunteer basis.

Headquarters maintains a "status" dataset in TSO/SPF. This dataset contains the status of the update runs. Users may determine whether the update is still running or if any problems have occurred by browsing the status dataset. This dataset also contains scheduling information such as dates for future training and implementation dates for major enhancements.

2.2   User Training

Training is conducted by the Headquarters staff on a monthly basis. Generally, between ten and fifteen users need to request training before a training class is scheduled. Headquarters offers a two and a half day beginners seminar and a two day advanced course. Only one of the two courses is offered each month. Training is offered regionally and usually occurs onsite or in the vicinity of the requesting majority.

The PCS training program encompasses all aspects of using PCS however, the following items are not included ; references to PCS User Guides used in the field, a detailed overview of the NPDES application and TSO/SPF training (TSO/SPF is offered by the NCC).

3.0   <u>Technical Overview</u>

3.1   Hardware/Software Environment

The PCS computing environment uses the 3090 IBM mainframe computer at NDPD. This system has been built using COBOL, CICS and Natural utilizing the ADABAS DBMS. The specifics of the PCS environment are detailed in the following sections.

3.2   Subsystem Environments

3.2.1   Data Entry

      BATCH –   Programs are written in batch COBOL.

      PCSADE –   Data entry programs written in NATURAL, edit processing handled by CICS COBOL.

      PCENTRY – Data entry programs are written in DBASE III.

3.2.2   Data Edits

Data edits are performed during online data entry. Batch edit programs are written in COBOL and online edit programs are written CICS COBOL. Initial screen editing is written in ADABAS/NATURAL.

3.2.3   Updates

All regular updates are performed biweekly in a batch COBOL mode. A "Direct Call" COBOL program is used to apply transactions to the database. DIRECT CALL programs access the database at a lower level than Fourth Generation NATURAL. Lower level meaning "closer" to machine code. This software is more difficult to develop and maintain, but provides more efficient transaction processing.

Valid edits for records which are dependent upon the existence of other related records are performed during online editing and batch update processing. If the necessary records exist the record is added to the data base.

3.2.4   Retrieval

      GENERALIZED RETRIEVAL – A series of batch COBOL programs which generate NATURAL code to access database records.

      INQUIRY – CICS COBOL and Dynamic Source NATURAL code

are used in conjunction to generate NATURAL queries to the database.

3.3 PCS Data

Information retained in PCS is related to the events surrounding permit compliance activities. Data related to permit issuance and acceptance, site inspections, government grants issuance, scheduling, waste disposal monitoring, enforcement actions, identification of violations, permittee protests and regulations appeals are all part of the PCS data domain.

3.3.1 Data Base

ADABAS is used as the PCS data base. The data residing in the data base is stored in a relational structure and accessed in a hierarchical format.

PCS data base access is possible through the PCS primary key. The primary key or NPID as it is called internally is an identification number which uniquely identifies each facility. The NPID is included as part of the key in every PCS data base record.

The PCS data base contains approximately 8 million records.

3.3.2 Files

PCS uses approximately 8 different files called the Permit Facility, Effluent, Compliance, Inspection, Enforcement, Evidentiary Hearings, Grant and Permit Events.

Permit Facility data contains general facility information such as name, address and classification.

Effluent data includes three levels of data; pipe schedule (identifies currently monitored pipe), parameter limits (identifies pipe parameters being measured), and measurements (records the parameter measurements).

Compliance data tracks schedules for milestone events and scheduling violations.

Inspection data records the inspection date, type and inspector.

Enforcement data identifies actions taken and which violations occurred to provoke enforcement.

Evidentiary Hearings stores data related to permittee protests and regulations appeals.

The Grants file contains records of which publicly owned water treatment plants were issued government grants.

Permit Events data tracks the issuance and acceptance of the permits.

3.4 Hardware

3.4.1 Type

CPU .... IBM 3090 - 300 (SIERRA SERIES)

3.4.2 Peripherals

The peripherals used for PCS are IBM or IBM compatible personal computers, TTY line by line terminals, IBM 3278 full screen terminals and IBM 3279 full screen color monitor terminals.

The PCs use KERMIT or other compatible software to upload and download data to the mainframe.

TTY terminals have the ability to emulate full screen with protocol conversion software.

3.5 Software

PROGRAMMING
LANGUAGES ...... COBOL (Batch & CICS)
ADABAS/NATURAL (4GL)
DBASE III

3.5.1 Online

Natural is used for the online or screen programs. Screen edit programs for online data are written in CICS COBOL.

3.5.2 Batch

COBOL is used for PCS batch processing programs.

3.5.3 Communications

Users in the field access PCS through a modem or central controller.

4.0 System Functions

4.1   System Input

4.1.1   Data Input

        The PCS design provides three methods to enter data ;
1. card image processing, 2. PCSADE and 3. PCENTRY. These
processes are described in the following sections.

        1. Card image processing requires users to create 80
character card image data sets and submit them via a batch run.
Once the card is submitted and the batch run activated, the card
image data is edited by PCS and an edit report is generated. The
card image format as depicted below, identifies the record type,
transaction type (add, delete, change) and the data itself.

        ie: D-NMD0002323001A9......861231

        The first character 'D' identifies the transaction as a
        Delete transaction.
        The next two characters '-N' identifies the record type
        as a measurement.
        The remaining characters represent measurement data.

        Card Image processing requires extensive TSO/SPF
knowledge.

        2. PCSADE is an on-line, menu driven, full screen
system that allows users to add new records and display existing
records for deletion or change. PCSADE provides online editing
so data is edited as it is entered.

        PCSADE offers Add, Change and Delete transactions,
however a Browse or View option is not available. The Change
function does not immediately update the data base, it submits an
update transaction which takes effect when the Batch Update
process is run. PCSADE provides a Help function. The Help
function contains information about how to use PCSADE, it does
not include a list of any acceptable entry codes.

        3. PCENTRY allows users to enter data on a PC and
upload the data to the mainframe. This system is menu driven with
full screen access similar to PCSADE.

4.1.2   Updates

Although three ways to enter data exist, there is only one way to apply the transactions to the PCS database, ie... update the database. Due to the high volume of data entered, no data is updated online. All update transactions are processed by a standard Update Job run twice a week.

4.2   System Output

4.2.1   Ad-Hoc Data Retrieval

Once the data has been applied to the database it can be retrieved. Currently there are two ways to retrieve data. They are : Generalized Retrieval and INQUIRY.

Generalized Retrieval is the most widely used PCS tool. This facility allows users to set up batch retrieval statements in a manner similar to the card image data entry. The user submits these statements and receives either a "canned" report or a customized report. The following example conveys how Generalized Retrieval works.

```
ie:  10 STTE = MD
     10 SIC2 = 4952
     20 FAC-NAME
```

The numbers 10,20 identify the commands.
A 10 command indicates selection criteria
A 20 command indicates what is requested to be displayed
The first 10 command requests the state (STTE) of
Maryland(MD)
The second 10 command indicates the user requests all sewage
treatment plants(internally identified by code 4952)
The 20 command indicates the user requests the Facility name
(FAC-NAME) be displayed on the report.

The subsequent report produced would display the names of all the sewage treatment plants in Maryland. Although, widely used because of its tremendous flexibility, Generalized Retrieval has batch limitations similar to the batch data entry method.

The online "INQUIRY" system provides an interactive single query function. Each request must be followed by pressing the 'ENTER' key, after which another request may be made. INQUIRY has two separate modes, Prompt and Command. The Prompt mode is menu driven and the user selects from a series of "canned reports". Examples of "line by line" processing and Prompt and Command modes can be found in Appendix A. The reports produced by the INQUIRY system appear online.

5.0   Sxstem Maintenance

5.1   User Change Control Process

        The following scenario depicts the process which
expedites system changes.

-   User reports problem to PCS Headquarters hotline.

-   Reported problem is logged on the PCS User Request
    form.

-   Headquarters staff analyzes the problem.

-   Headquarters staff determines extent of problem.

-   Problem is assigned a priority by Headquarters staff
    according to effect on overall user community.

-   Headquarters management meets with technical
    management to determine if resolution requires a
    system enhancement or a software modification.

5.1.1   System Enhancement

        System enhancements are defined as system problems or
changes which require necessitate research before implementation.
First, an analysis of the enhancement is conducted. Once the
study is complete and the effects on the system are determined
the enhancement request is entered into the Enhancement Library.
Included in the library are ; date, description and status of the
request.

        A representative user group further prioritizes the
request and presents it to the technical staff, who initiate the
enhancement plan.

        When a batch card image data entry enhancement is made
all interface states must modify their conversion software to
accommodate the change.

5.1.2   System "Problems"

        System "problems" are classified as system
inadequacies or changes requiring no additional research. (A
system problem is less complicated than a system enhancement).
Once a modification request is made it is logged into the Problem
Library. The problem is assigned to a programmer, who upon
resolution of the problem updates the library status of the
problem from pending to complete.

5.2   Technical Change Control Process

The mechanics of the technical change control process are the same for system enhancements as they are for software "problems". Both types of approaches require existing software to be modified.

5.2.1   Change Control System Design

PCS incorporates two software environments, development and production thus adhering to standards set by NDPD. The production environment contains the actual software and data the user accesses. Controls have been implemented which restrict production updates outside of the regular update process. The development environment allows software modification and testing to be done on subsets of actual data. This dual system allows software maintenance and modification without interrupting the production system.

5.2.2   Change Control Documents

Documents involved in the change control process are the :

-   PCS User Request

-   PCS Cobol/Fortran Tracking Form

-   PCS Natural Program Tracking Form

-   Change/Enhancement Test and Acceptance Form for Natural Programs

-   PCS Program Update Log

5.2.3   Change Control Activity

After the software has been changed the programmer is responsible for testing the change.

Once testing is complete the original request form is updated to indicate a resolution for the problem is in effect. Additionally, the software tracking forms and change acceptance forms both online and bound copies are completed. All forms are reviewed by a senior project manager.

5.2.4   Change Control Testing

Testing is performed both by the programmer making the change and Headquarters personnel. The modifications must be tested and cleared by both parties before being passed to the National Computer Center (NCC).

5.2.5   Implementation of Changes

The NCC is responsible for moving a software change from development into production.

6.0   Documentation

PCS User's Guides

GENERALIZED RETRIEVAL
DATA ENTRY, EDIT and UPDATE (PCSADE, PCENTRY, Batch)
INQUIRY
DATA DICTIONARY

Technical Documentation

PCS Maintenance Manual
Production Control Guide

6.1   User Documentation

Users Guides exist for each PCS subsystem. Each guide contains an overview of the PCS data organization, as well as detailed procedures pertaining to accessing the subsystem, such as ; interactive sessions, screen displays, prompts and reports.

Users Guides are currently under revision. Headquarters plans to have these revised documents online sometime in fiscal year 89. Online manuals will benefit the users in that updates to the users guides will be more manageable, and the time consuming and costly process of mailing manuals will be eliminated.

6.2   Program Documentation

Maintenance Manuals - There is an extensive collection of program maintenance documentation on each of the PCS subsystems. These documents contain detailed program descriptions of the subsystem programs. For instance, the PCSADE document describes each data entry screen program (NATURAL) and all of the CICS COBOL editing programs. The description includes a general overview of each program and the input and output formats where appropriate. In addition, program flow diagrams are also contained in these documents.

The PCS project team also keeps a "hard copy" library of every program in the system filed by program name.

Production Control - The Production Control manual is an extensive document detailing the staffs responsibilities. This document contains listings of all update JCL jobs, the most common errors that may be encountered, and the appropriate responses to resolve them.

6.3   Data Dictionary

The PCS data dictionary information includes data element descriptions and formats.

Appendix I

System Function Sample Screens

Main Menu Screen

MAIN MENU SCREEN

SCREEN ID	SCREEN NAME	SCREEN ID	SCREEN NAME
FAC1	FACILITY DATA SCREEN 1	OFLG	OUTFALL GENERAL DATA
FAC2	FACILITY DATA SCREEN 2	OFLT	OUTFALL TREATMENT TYPE/COMMENTS
FACA	FACILITY ADDRESS	EVIO	EFFLUENT MEASUREMENTS/VIOLATIONS
FACO	OWNER/OPERATOR ADDRESS	CVIO	COMPLIANCE SCHEDULE VIOLATIONS
INSP	INSPECTIONS	SVIO	SINGLE EVENT VIOLATIONS
CSCH	COMPLIANCE SCHEDULES	PCI1	PRETREATMENT COMP INSP SCREEN 1
PTRK	PERMIT TRACKING	PCI2	PRETREATMENT COMP INSP SCREEN 2
EVHR	EVIDENTIARY HEARINGS	PAU1	PRETREATMENT AUDIT SCREEN 1
GRNT	GRANTS	PAU2	PRETREATMENT AUDIT SCREEN 2
LIMS	LIMITS	PAU3	PRETREATMENT AUDIT SCREEN 3
LIMM	LIMIT MODIFICATIONS	PPS1	PRETREATMENT SUMMARY
ENAC	ENFORCEMENT ACTION	TABS	PCS CODE TABLE MODIFICATIONS
EAKS	ENFORCEMENT ACTION KEYS	QUIT	** TERMINATES SESSION **

ENTER SCREEN ID: _____   DO YOU WANT THE CHANGE OPTION (Y/N)? N

PCS-ADE

Facility Owner/Operator Address Screen

PERMIT # _____ TRANS CODE _   OWNER/OPER ADDRESS SCREEN ID: FACO

- - - - FACILITY OWNER ADDRESS - - - -
FACILITY NAME (ONAM) _____
ADDRESS LINE1 (OST1) _____
ADDRESS LINE2 (OST2) _____
CITY (OCTY) _____ STATE (OSTT) __ ZIP (OZIP) _____
          TELEPHONE (OTEL) _____

- - - - FACILITY OPERATOR ADDRESS - - - -
FACILITY NAME (ENAM) _____
ADDRESS LINE1 (EST1) _____
ADDRESS LINE2 (EST2) _____
CITY (ECTY) _____ STATE (ESTT) __ ZIP (EZIP) _____
          TELEPHONE (ETEL) _____

ACCEPT? Y/N/M: Y

```
 SCREEN ID      SCREEN NAME           SCREEN ID    SCREEN NAME
::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
   FAC1     FACILITY DATA SCREEN 1    OFLG     OUTFALL GENERAL DATA
   FAC2     FACILITY DATA SCREEN 2    OFLT     OUTFALL TREATMENT TYPE/COMMENTS
   FACA     FACILITY ADDRESS          EDMR     EFFLUENT DMR PAGE
   FACO     OWNER/OPERATOR ADDRESS    EVIO     EFFLUENT MEASUREMENTS/VIOLATIONS
   INSP     INSPECTIONS               CVIO     COMPLIANCE SCHEDULE VIOLATIONS
   CSCH     COMPLIANCE SCHEDULES      SVIO     SINGLE EVENT VIOLATIONS
   PTRK     PERMIT TRACKING           PCI1     PRETREATMENT COMP INSP SCREEN 1
   EVHR     EVIDENTIARY HEARINGS      PCI2     PRETREATMENT COMP INSP SCREEN 2
   GRNT     GRANTS                    PAU1     PRETREATMENT AUDIT SCREEN 1
   LIMS     LIMITS                    PAU2     PRETREATMENT AUDIT SCREEN 2
   LIMM     LIMIT MODIFICATIONS       PAU3     PRETREATMENT AUDIT SCREEN 3
   ENAC     ENFORCEMENT ACTIONS       PPS1     PRETREATMENT SUMARY
   EAKS     ENFORCEMENT ACTIONS KEYS
  ENTER SCREEN ID:

ESC: End Data Entry Function;
-------------------------------------------------------------------------
```

FACILITY OVERVIEW REPORT

GENERAL INFORMATION

PERMIT NUMBER: CT0000086   FACILITY NAME: AMERICAN CYANAMIDE COMPANY

ACTIVITY STATUS   : ACTIVE   ACTIVITY DATE:
MAJOR/MINOR DISCHARGER   : MAJOR
TYPE OF OWNERSHIP   : PRIVATE
STD INDUSTRIAL CLASS(SIC): PLASTICS MATERIALS AND RESINS
INDUSTRIAL CLASS (INCL)   : PRIMARY   PRIMARY CATEGORY: PLAST

CITY : WALLINGFORD /T/   STATE : CONNECTICUT
COUNTY: NEW HAVEN   REGION: 01 SUB-REGION: 2

RIVER BASIN   : NE/PAWCATUCK   RIVER REACH:
RECEIVING WATERS: QUINNIPIAC RIV

    ENTER A CARRIAGE RETURN TO CONTINUE, OR
    ENTER 'SKIP' TO SKIP THE NEXT SECTION -- PERMIT INFORMATION

Appendix II

Documentation Matrix

PCS	SYSTEMS REQUIRING OIRM INVOLVEMENT	
	●	EEI-1 Mission Needs Analysis
	●	EEI-2 Preliminary Design and Options Analysis
	●	EEI-3 Project Management Plan
	●	EEI-4 System Implementation Plan
	●	EEI-5 Detailed Requirements Document
	●	EEI-6 Software Management Plan
	●	EEI-7 Software Test & Acceptance Plan
	●	EEI-8 Software Preliminary Design Document
	●	EEI-9 Software Detailed Design Document
●	●	EEI-10 Software Maintenance Document
●	●	EEI-11 Software Operations Document
●	●	EEI-12 Software User's Reference Guide
	●	EEI-13 System Integration Test Report