Failure/Maintenance Data Base for the Tritium Systems Test Assembly

Kathleen M. Gruetzmacher

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FUSION TECHNOLOGY INSTITUTE

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INTRODUCTION

The reliability and availability of future fusion power plants depends on the reliability and availability of the systems which make up the plants. A study was undertaken at Los Alamos National Laboratory as part of an effort to begin collecting coherent data on fusion systems for reliability and availability analysis. The major goal of the study was to determine the feasibility of using CREDO, a component-oriented data base, to collect and analyze data on fusion systems. For purposes of this study, CREDO was adapted for use on an IBM PC using the Tritium Waste Treatment System of the Tritium Systems Test Assembly at Los Alamos as a test case.

I. CREDO

The Fusion Data System at the Tritium Systems Test Assembly is based on that of the Centralized Reliability Data Organization (CREDO) at Oak Ridge National Laboratory.[1] CREDO is funded by the Department of Energy and began development at Oak Ridge in 1978. It was designed as a national reliability data base and data analysis center for advanced fission reactors in response to the 1975 National Advanced Reactor Reliability Data System Meeting. Data is currently being input to CREDO from such sources as the Fast Flux Test Facility (FFTF) at Hanford, the Experimental Breeder Reactor 2 (EBRII) at Argonne and test loops of the Energy Technology Engineering Center (ETEC) at General Electric and at Westinghouse (WAESD). In addition, data collection has been initiated at JOYO and four Japanese test loops.

The CREDO data base methodology calls for collection of three types of data: engineering data, event data and operating data. The engineering data describes each component of a system as fully as possible. It involves a one-time submission of data on a component, with a unique identifying number which

tracks that component through its lifetime. The event data is a description of each failure or reportable event in a system. A reportable event includes unscheduled repair or maintenance, necessary repair or replacement during scheduled maintenance and any unanticipated change in normal operating conditions because of a component failure. The last element of the data base, the operating data, is a quarterly report showing operating time for the entire facility.

At this time, CREDO's main function at Oak Ridge is the collection and dissemination of the data described above. Data is collected and sent to CREDO on forms such as those shown in Appendix A. CREDO provides services to users such as organized data for computations, and statistics on events and failures. For the project at TSTA, a data collection system very similar to CREDO's was put on an IBM PC using a commercial data base manager called KMan.

II. KMAN

Knowledge Manager (KMan) is a commercial software package from Micro Data Base Systems, Inc. KMan is a relational data base manager which is very flexible and can be customized to the user's needs. That is, it is programmable and includes such features as if-then-else statements, while-do statements and function calls. Data in KMan is organized into tables and can be retrieved in a variety of ways, e.g., a listing of selected data or a printed form.

KMan is currently available in both PC and VAX versions. The IBM PC version of KMan is currently being used at Los Alamos, EG&G Idaho and Wisconsin to collect fusion data. This data can be traded between locations easily using floppy disks.

III. TWT

The Tritium Waste Treatment System (TWT) is part of the Tritium Systems Test Assembly (TSTA) at the Los Alamos National Laboratory. TSTA is a facility designed to demonstrate the processes and equipment for handling the fuel and exhaust from a magnetic fusion reactor which uses deuterium and tritium as fuel. TSTA became operational in 1982 and has been in the process of testing and evaluation of its subsystems since then. The Tritium Waste Treatment System began testing in February, 1984 and has been in almost continuous operation since that time.[2]

The main process loop of TSTA is shown in Fig. 1.[3] Gases which simulate the effluent gases from a magnetic fusion reactor are sent through the vacuum system to be processed in the fuel cleanup unit and the isotope separation system. Nonusable gases from this cleanup process are sent to the Tritium Waste Treatment System. Effluent gases from experimental contamination studies (e.g., glove box atmosphere) are also handled by the Tritium Waste Treatment System.

The main components of the Tritium Waste Treatment System are shown in Fig. 2. The effluent gases enter this system through two filters, an oil separator filter and a charcoal filter. From there, the gases are processed through a catalyst bed and molecular sieve beds. Tritiated water from this processing is put into drums and sent to be buried. The cleaned gas is sent through final radiation monitoring and released to the stack. All of the major components of the TWT are redundant except the catalyst bed.

IV. ADAPTING CREDO TO FUSION SYSTEMS

The objectives of the CREDO project at TSTA included adapting CREDO for use in fusion, programming the data base on the IBM PC with KMan software,

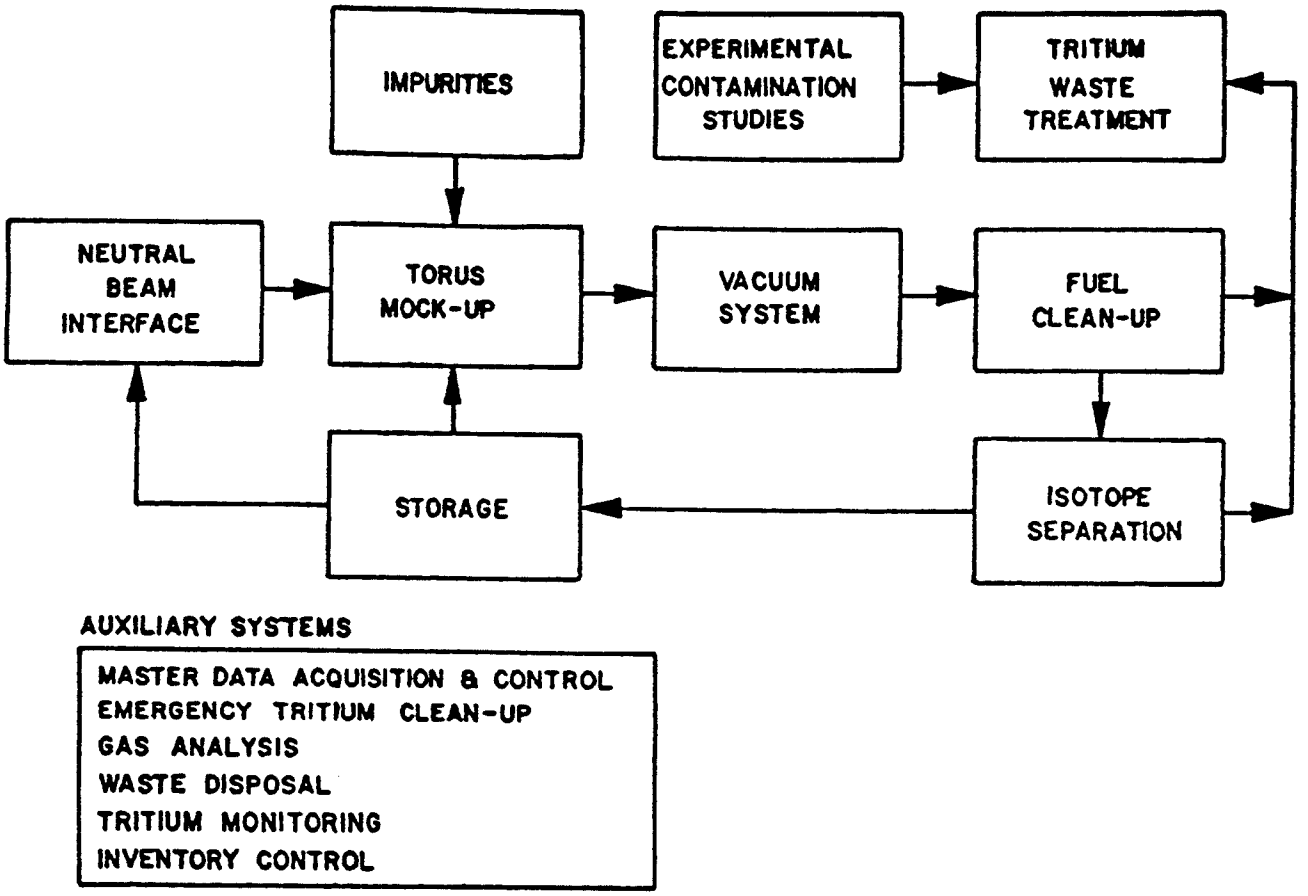

Fig. 1. The Tritium Systems Test Assembly process loop.

Fig. 2

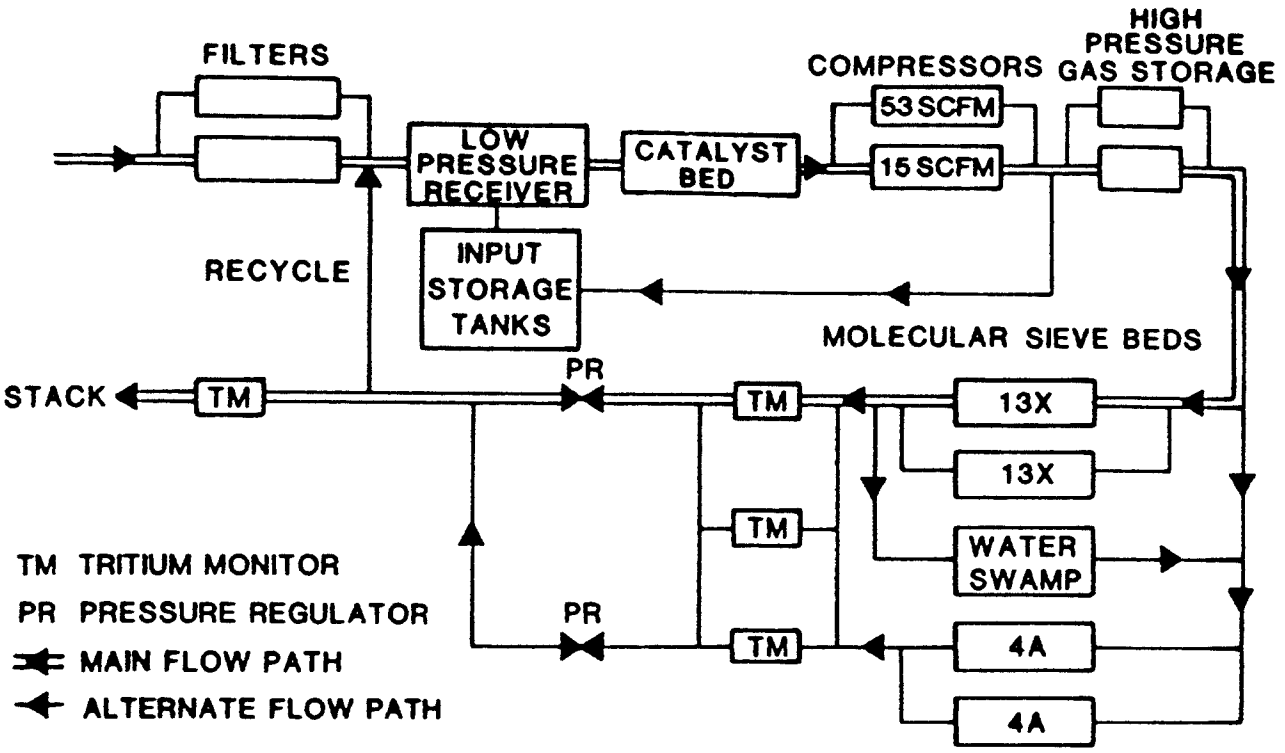

Fig. 2. Major components of the Tritium Waste Treatment System.

collecting the appropriate data on the TWT, and testing the adapted data base with the TWT data. The data collected on the Tritium Waste Treatment System will also be used as test data for another type of fusion data base currently being developed by Professor Charles Maynard at the University of Wisconsin.[4] These objectives have substantially been met. Adapting the CREDO methodology of data collection for use in fusion systems involved only a few changes in the data collection forms themselves. These adapted forms are included in Appendix B.

Putting the data base on the IBM PC involved determining what data was needed to fit the CREDO data base structure, then constructing logical tables to hold the data and finally programming the PC for data input, changes and output. The data needed to fit the CREDO structure is that shown in the adapted forms included in this report as Appendix B. Each table holds a set of related data and each record in a table holds data for a particular component (in the case of engineering data), event (for event data) or operating period (for operating data).

The tables which were constructed to hold the data were defined in a slightly different way for each type of data. Again, the CREDO structure calls for 3 types of data: engineering data describing each component, event data describing each reportable event, and operating data describing the quarterly operating time for the entire facility. The engineering data, in turn, is split into base engineering data and supplemental engineering data. The base engineering data describes a component by its function, manufacturer, position in the system and so on. The supplemental engineering form categorizes the component into a particular class of components, for example, a motor's duty cycle is typed as either emergency only, continuous, or cyclic

and its phase is either poly or single. This supplemental form also includes the design parameters for the component (refer to the CREDO data forms in Appendix A for a sample of the supplemental forms).

The base engineering data is held in 7 tables. The table definitions and a completed sample for each are given in Appendix C. One of the fields in each table serves as a key to tie all of the information for a particular component together. In the case of the base engineering data, this key field is the CREDO identification number. Once the system and site names are known, this identification number uniquely identifies a component and tracks it throughout its lifetime.

The CREDO identification number is assigned at the system site and is in the form

rr-dddd-dd

where r means any character and d means digit. The characters are acronyms for the component type, e.g., EH for Electric Heater. The first four digits identify the component in the system, e.g., EH-0001 would identify one of the electric heaters in the system, EH-0002 another, etc. The last two digits identify which generation the component is, e.g., the original electric heater #1 would be identified as EH-0001-01. When this heater was replaced or substantially modified, the new version would become EH-0001-02 and new engineering data would be submitted to CREDO.

Another identification number, the TSTA parameter identification number, is also included for each component. This is an identification scheme which was already in place at TSTA when the CREDO project there was begun. This number is used in the master data acquisition and control (MDAC) system at TSTA and is not unique to each component. It is used here as the site ID

number. Each component is also identified by two names, the common name used at the site and the generic CREDO name for the component type.

The supplemental engineering data is arranged differently from the base engineering data. The key field for this set of data is also the CREDO ID number. This data is held in 12 tables, one for each generic component type. The CREDO data base at Oak Ridge uses 45 generic component types. It uses a different supplemental form for each component type (45 forms). A total of 200 components were identified in the Tritium Waste Treatment system at TSTA. These 200 components were categorized into 12 of the 45 generic component types. Only these 12 types were included in the data base at TSTA since memory space was limited and programming the forms and tables is simple but bulky.

Determination of how to split the Tritium Waste Treatment system into components was based on the physical layout of the TWT. Each well-defined unit on the system blueprint was identified as a component, e.g., the catalytic convertor is one component and the pressure relief valve between the tritium monitors is another component. Valves which would be used to isolate a tritium contaminated component in the event that the component had to be removed for repair or replacement were considered as part of the larger component rather than as separate components. Process piping into and out of the system and between components was not considered. Likewise, wiring and the Master Data Acquisition and Control system were not considered in this study. Further breakdown of this system can be done at a later time if appropriate.

The event data is held in 8 tables. These tables use an event specific key, the TSTA Event Report Number. A system for reporting failures has been in effect at TSTA for over a year. During that time, 125 reportable events

were recorded, 25 of which involved the Tritium Waste Treatment system. The TSTA failure reporting system was folded together with the CREDO event data forms to produce a hybrid which is specific to TSTA. This hybrid includes the capability to collect and produce data in the form familiar to TSTA personnel and also to output it on the CREDO data forms. Samples of the original and current TSTA Event Data Reporting forms are included in Appendix D. The general philosophy behind this part of the data collection was to require a minimum amount of information from the person originating the report (the portion above the asterisks on part I of the current forms) with the option of completing more information if it is known at the time of the report. Both parts I and II are then sent along with the component when it is repaired, or retained by the person responsible for following through on completion of the report. At TSTA, this person is the quality assurance engineer for TSTA, who works closely with the system designer to obtain complete information on the failure. Blank reporting forms are available in several convenient locations about the facility and initial reports of events are picked up periodically from these locations by the quality assurance engineer.

The operating data is held in one table. This quarterly report, along with the operating and duty factors in the engineering data, produces a crucial part of any availability or reliability analysis -- the actual time that a component has been in operation (and the number of cycles if appropriate). The actual time the entire facility was in full, degraded or shutdown operating during the quarter is multiplied by the corresponding operating or duty factor for the component to give a good estimate of the actual time the component was in operation without keeping a running total for each component.

Programs for producing blank and completed CREDO forms are included as Appendix E. This appendix also includes the programs used to print blank TSTA event data forms and programs which provide a menu structure for working with the data.

V. CONCLUSIONS

The fission industry collects and disseminates data on component usage and failures using such data bases as NPRDS (Nuclear Power Reliability Data System) and CREDO (for fast fission test facilities). Much of this fission data had to be collected in a retrospective sense by melding together data from many different systems already in use and from personal memory. It would be highly advantageous for the fusion industry to adopt a reliability and availability data base now, before the industry is completely mature. The CREDO component-oriented data base provides an appropriate structure for the collection and organized output of such data. The CREDO data base can be programmed on an IBM-PC with site specific requirements incorporated into the local data base. Usage of a PC is appropriate for a small scale operation such as a test facility. Data can be traded between facilities or sent to CREDO using floppy disks.

The question of whether to adopt CREDO for use in fusion will be considered at the next meeting of the Fusion Availability Working Group, scheduled for January 1986.

Acknowledgment

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References

1. "Centralized Reliability Data Organization (CREDO) Guide for Completing Data Input Forms," Oak Ridge National Laboratory, Oak Ridge, TN (1985).

2. R.V. Carlson, S.P. Cole, F.A. Damiano and W.A. Stone, "Early Operating Experience with the Tritium Systems Test Assembly Tritium Waste Treatment System," Proceedings of the Second National Topical Meeting on Tritium Technology in Fission, Fusion and Isotopic Applications, Dayton, OH (April 1985).

3. J.L. Anderson and J.R. Bartlit, "The Development of Tritium Technology at the Tritium Systems Test Assembly," Proceedings of the 12th Symposium on Fusion Technology, 527 (1982).

4. Z. Musicki, C.W. Maynard, Y. Watanabe, A. Bennethum, K. Gruetzmacher, "The Fusion Engineering Data Base," University of Wisconsin Fusion Technology Institute Report UWFDM-659 (November 1985).

Appendix A: Sample CREDO Forms

CREDO BASE ENGINEERING DATA FORM
(Use for All Components)

* * * * * * * * * PLEASE PRINT CLEARLY * * * * * * * * *

1. REPORT IDENTIFICATION

(a) Report I.D. No. _____ (CREDO Use Only)

(b) Site* YOURSITE (c) Unit* YOURUNIT

(d) Report Date (Mo./Da./Yr.) 04/11/29

(e) Report Status: ☒ New ☐ Change ☐ Delete (For CREDO Use Only)
If not "New", Date of Previous Report (Mo./Da./Yr.) __/__/__

2. COMPONENT IDENTIFICATION

(a) Name* VALVE___ (b) Site I.D. No. P38-V-0001 (c) PPS Yes ☐ No ☒

(d) CREDO I.D. No. _____ (CREDO Use Only) (e) Model No. MXP-33

(f) Manufacturer HAMMEL DAHL (Code) ____

(g) Spec./Standard No. RDT-E1-18T

(h) Safety/Quality Class(es) Class 1

(i) Drawing No(s). PID-X1-4073 (Rev. 1) ☐ Site ☒ Mfg.

(j) Date Installed 12/19/26 Mo. Da. Yr. Modified __/__/__ Mo. Da. Yr. Removed __/__/__ Mo. Da. Yr.

3. COMPONENT USE AND GENERAL DESIGN INFORMATION

(a) System* PRIMRXHT Critical System Yes ☒ No ☐

(b) Subsystem* MPRIHILP

(c) Design Function Remote operated sodium isolation valve.

(d) Application Hot leg isolation valve, primary loop A.

(e) Design Life 175,200 (Hrs.) 1000 (Cycles)

4. OPERATING FACTORS

Unit Status	Oper. Factor (%)
1. Power Operations	100
2. Hot Standby	100
3. Cold Shutdown	100

5. DUTY FACTORS

Unit Status	Cycling Rate (Per Hr.)
1. Power Operations	0
2. Hot Standby	0.05
3. Cold Shutdown	0.0056

6. MAINTENANCE AND INSPECTION/TEST DATA

(a) Maintenance Interval and Type Annual - Clean and lubricate operator gears. (MR-P-101).

(b) Inspection/Test Interval and Type Daily - Operator motor ground check (IR-P-7); Prior to Startup - Opening and closing operational and time check (IR-P-58).

7. RADIATION EXPOSURE

Neutron Flux Level _____ $N/cm^2 sec$

8. REMARKS, SPECIAL INFORMATION

1. Construction is not of the normal gate valve design (i.e., disc does not slide up or down). The disc is rotated or "opened" like a door by the operating shaft. When the disc is in the shut position a locking shaft may also be operated to ensure equal distribution of the forces placed on the seating surface.

2. Argon cover gas is supplied through the operating shaft.

3. Resistance heated

4. Seat material is No. 6 Stellite

5. The pressure drop across this valve for the operating parameters given is 0.1 psid.

6. Has a manual operator installed.

9. SIGNATURES	Last Name, Initials	Signature	Site Phone No.
Report	Doe, J. R.	J. R. Doe	5-6981
CREDO			

PLEASE CHECK TO BE SURE AN APPROPRIATE ENGINEERING DATA SUPPLEMENT HAS BEEN ATTACHED.

USE THE REVERSE SIDE OF THIS FORM TO ADD ANY ADDITIONAL ENGINEERING DATA OR DESCRIPTIVE INFORMATION DESIRED.

*These items must be completed using coded words.

CREDO ENGINEERING DATA SUPPLEMENT

COMPONENT DESCRIPTORS AND DESIGN DATA FOR

MOTORS (MOTOR)

COMPONENT DESCRIPTORS

Type

- ☐ Capacitor Start
- ☐ D.C. Commutator Single Speed
- ☐ D.C. Commutator Variable Speed
- ☐ Hydraulic
- ☐ Hysteresis/Synchronous
- ☐ Induction Repulsion Start
- ☐ Induction Slip Ring
- ☒ Induction Squirrel Cage
- ☐ Penumatic
- ☐ Split Phase
- ☐ Synchronous
- ☐ Other

Keyword _ _ _ _ _ _ _ _

Duty Cycle

- ☐ Emergency Only
- ☒ Continuous
- ☐ Cyclic

Keyword _ _ _ _ _ _ _ _

Phase

- ☒ Poly
- ☐ Single

Keyword _ _ _ _ _ _ _ _

	Design Parameters	Value	Units
1	Design Amperage	1500	AMPS
2	Design Power Rating	5000	HP
3	Design Temperature Rise	200	DEGF
4	Design Voltage	480	VOLTS
5	Driver Pressure (Hydraulic)		PSIG
6	Driver Pressure (Pneumatic)		PSIG
7	Fluid Flow (Hydraulic)		GPM
8	Gas Flow (Pneumatic)		FT3/HR
9	Nominal Ambient Temperature	75	DEGF
10	Nominal Rotational Speed	1700	RPM
11	Power Load at 100%	1250	KVA

EVENT DATA REPORTING FORM (CREDO-1, Rev. 1)

1. REPORT IDENTIFICATION (a) Report I.D. No. _____ (CREDO Use Only)

(b) Site* YOURSITE (c) Unit* YOURUNIT (d) Report Date 06/15/82 Mo. Da. Yr.

(e) Occurrence Title Primary Hot Leg Isolation Valve Stuck Open

(f) Report Status: ☒ New ☐ Chng (g) Previous Report Date __/__/__ Mo. Da. Yr.

(h) Related Reports: UOR YOUR-82-31 Other _____

(i) Event Date 06/09/82 Mo. Da. Yr. Event Time 1930 hrs.

2. EVENT NARRATIVE At 1930 the reactor operator attempted to shut Loop A HLIV as part of the precritical checkoff requirements. The open indication light remained on. The operator observed no changes in Loop A parameters. He

(Attach additional narrative on separate sheet as desired)

3. EVENT DETECTION/IMMEDIATE ACTION (a) Detection Date 06/09/82 Mo. Da. Yr. Time 1930 hrs.

(b) Method of Detection* TESTING (c) Time/Detection to Initial Action* 0

(d) Operating Status: Unit* COLDSD System* NORMOPS Subsystem* REDNORM

(e) Initial (Immediate) Action When it became obvious the open light would not go out, the operator began checking his indicators

4. COMPONENT FAILURE DATA

(a) Component Name* VALVE (b) CREDO I.D. No.* VA0001 00

(c) Site I.D. No.* P38-V-0001 (d) System* PRIMRXHI (e) Subsystem* MPRIHILP

(f) Component Description Motor operated, 28-inch, sodium, freeze seal, GATE VALVE

(g) Failure Type* MECH (h) Failure Mode* NOCLOSE

(i) Failure Cause* INCPART (j) ☒ Primary ☐ Secondary

(k) Failure Cause Narrative since this problem has occurred before practically every time the plant is in cold shutdown, it is felt a larger motor operator is required to break the freeze seal.

(Attach additional narrative on separate sheet as desired)

(l) Failure Effects: System MINIMUM OPERATING TEMP.-350° (Hours Lost = 1)

Unit MINIMUM OPERATING TEMP-350° (Hours Lost = 0)

Other Items Affected Steam System maintenance

(m) Critical Parts Valve operator motor.

5. CORRECTIVE ACTION (a) Maintenance Action NONE (b) Admin. Action OTHER
(c) Interim Continue operating above 350°F in the primary loops until a final course of action can be decided.
(d) Final Unknown at this time. Problem is under consideration. A design change is expected.

6. HUMAN INTERACTION DATA
(a) Human Initiator? Yes (No) If Yes, Explain _____
(b) Human Interaction/Engineering Potential Either design calculations were wrong or incorrectly interpreted for selecting the operator motor ratings necessary to do the job.

7. MAINTENANCE DATA
(a) Restoration Time (Hours/Manhours): (i) Total __/__ (ii) Administrative __/__
(iii) Logistics __/__ (iv) Indirect Repair __/__ (v) Direct Repair __/__
(vi) Retest __/__ (vii) Restart __/__
(b) Time Since Last (i) Maintenance 1848 (ii) Testing 9
(c) Maintenance Narrative Last maintenance was the annual clean and lubricate operator gears (MR-P-101). The last inspection/test was the daily ground check of the operator motor. (IR-P-1). This problem has occurred seven times before.

8. REMARKS:
Block 5.(b) - other - The problem is being considered. It is not yet known what action, if any, will be taken.

9. SIGNATURES:	Last Name, Initials	Signature	Site Phone No.
Report	Doe, J. R.	J. R. Doe	5-6981
CREDO			

*These items must be completed using coded words.

EVENT NARRATIVE (CONT') - Again tried to shut Loop A HLIV, AND the results were the SAME. The shift supervisor was notified. He sent an AUXILIARYMAN to investigate, and to attempt to manually shut the VALVE. The AUXILIARYMAN reported NO visible OR AUDIBLE signs of problem, however he could not shut the valve manually. Checks showed the motor operator was receiving power AS designed. It WAS concluded the freeze seal could not be broken. Since the heaters were already on, it WAS decided to increase PRIMARY temperature by increasing pump speeds. At 2030, after the temperature had been raised from 300°F to 350°F, Loop A pump WAS secured AND the VALVE operated PROPERLY. PRIMARY temperature was kept at 350°F, AND the precritical checks were allowed to continue.

INITIAL (IMMEDIATE) ACTION (CONT') - FOR ANY PARAMETER changes that might indicate the VALVE did in FACT close fully OR PARTIALLY.

FAILURE EFFECTS: OTHER ITEMS AFFECTED (CONT') - on components FOR which two VALVE protection is not possible can not be performed until the temperature can be lowered to 300°F, the secondary SODIUM dumping temperature. Otherwise Steam generator temperature will remain above 200°F, and thus steam will be produced.

OPERATING DATA REPORTING FORM (CREDO-3)

1. REPORT IDENTIFICATION — Report I.D. No. _____ (CREDO Use Only)

Site* YOURSITE Unit* YOURUNIT Report Date 04/11/80 (Mo. Da. Yr.)

Report Period Start Date 01/01/80 (Mo. Da. Yr.) Report Period End Date 03/31/80 (Mo. Da. Yr.)

2. OPERATING TIMES (HOURS)

MODE-1	Power Operations	720 Hour(s)
MODE-2	Hot Standby	960 Hour(s)
MODE-3	Cold Shutdown	480 Hour(s)

3. NUMBER CREDO EVENT REPORTS THIS REPORTING PERIOD FOR THIS UNIT: 7

4. FACILITY AVAILABILITY DATA

Design Output** 400 MWT Authorized Output This Report Period** 10 MWT

Report Period Total Output** 210 MWDT

Outages:	Number	Hours Expended
Scheduled	8	677
Unscheduled	5	763

Comments/Discussion Four unscheduled outages were the result of SCRAMS due to failures in protection instruments. the other resulted from operator error and component DAMAGE.

For Test Facilities:

Number of Transients or Cycles This Period _____

Total Hours at Transient of Cyclic Conditions _____

5. SIGNATURES:

	Last Name, Initials	Signature	Site Phone No.
Report	Doe, J.R.	J.R. Doe	5-6981
CREDO			

* These items must be completed using coded words.

** Output units depend on type of facility, and are specified by mutual agreement of CREDO and site staff.

Appendix B: Adapted CREDO Forms

CREDO BASE ENGINEERING DATA FORM

1. REPORT IDENTIFICATION (a) Report ID No. _____

(b) Site* LANL (c) Unit* TSTA

(d) Report Date (Mo./Da./Yr.) 1/01/01

(e) Report Status: x New _ Change _ Delete (CREDO use only)

If not "New", Date of Previous Report (Mo./Da./Yr.) 1/01/01

2. COMPONENT IDENTIFICATION

(a) Name* gasdryer (b) Site ID No. TWT-D-MSB (c) Plant Protection System x yes _ no

(d) CREDO ID No. BD-0004-01 (e) Model No.

(f) Manufacturer Henderson Engineering Co., Inc (Code) H153

(g) Spec./Standard No. TTA-SP-113-2,R1

(h) Safety/Quality Class(es) O

(i) Drawing No(s). C 3971 _ Site _ Mfg.

(j) Date Installed / / 0 Mo.Da.Yr. Modified / / 0 Mo.Da.Yr. Removed / / 0 Mo.Da.Yr.

3. COMPONENT USE AND GENERAL DESIGN INFORMATION

(a) System TRITIUM Critical System _ yes x no

(b) Subsystem TWT

(c) Design Function Gas Dryer

(d) Application Molecular Sieve Bed

(e) Design Life 0.00 (hrs.) 0.00 (cycles)

4. OPERATING FACTORS

	Unit Status	Oper. Factor (%)
1.	Normal Operation	0.0000
2.	Limited Operation	0.0000
3.	Shutdown Operation	0.0000

5. DUTY FACTORS

	Unit Status	Cycling Rate (Per Hr.)
1.	Normal Operation	0.0000
2.	Limited Operation	0.0000
3.	Shutdown Operation	0.0000

6. MAINTENANCE AND INSPECTION/TEST DATA

(a) Maintenance Interval and Type

(b) Inspection/Test Interval and Type

7. RADIATION EXPOSURE

Neutron Flux Level 0.0000

Tritium Environment 0.000

8. REMARKS, SPECIAL INFORMATION

9. SIGNATURES	Last Name, Initials	Signature	Site Phone No.
System Designer			
CREDO			

CREDO ENGINEERING DATA SUPPLEMENT

ELECTRIC HEATERS (EHEATER)

TYPE

1. Induction
2. Radiant
3. Resistance
4. Other

Keyword INDUCT

FUNCTION

1. Immersion
2. Space Heating
3. Trace Heating

Keyword IMMERS

HEATER FORM

1. Calrod Unit
2. Inductive Work Coil
3. Radiative Panel
4. Resistance Wire
5. Other

Keyword INDCOIL

ENTER OPTION NUMBER: 2

HIT RETURN TO CONTINUE

HEATER APPLICATION

1. Building
2. Cold Trap
3. Engine
4. Evaporator
5. Fuel Processing
6. Heat Exchanger
7. Instrumentation
8. Pipe
9. Plugging Meter
10. Process and Impurity Monitoring
11. Process Media
12. Pump
13. Room Cell
14. Steam Generator
15. Super Heater
16. Tank/Drum
17. Valve
18. Other

Keyword VALVE

HEAT DISTRIBUTION

1. Contact
2. Convective
3. Forced Draft
4. Radiative
5. Other

Keyword RADIANT

CONTROL

1. Auto Sensored
2. Manual

Keyword MANUAL

HIT RETURN TO CONTINUE

ENTER OPTION NUMBER: 2

POWER	DUTY CYCLE
1. Alt. Current	1. Continuous
2. Dir. Current	2. Cyclic
Keyword AC	Keyword CONTIN

ENTER OPTION NUMBER: 1

HIT RETURN TO CONTINUE

ELECTRIC HEATERS (EHEATER)

Design Parameters	Value	Units
1. Capacity Power Rating	12.00	KW
2. Design Current	1.00	AMP
3. Design Frequency	12.50	HZ
4. Design Resistance	144.70	OHM
5. Design Voltage	12V.00	VOLTS
6. Maximum Design Temperature	4.00	DEGF
7. Wiresize	4.00	AWG

CREDO EVENT DATA REPORTING FORM

1. REPORT IDENTIFICATION

(a) CREDO Report ID No. _____

(b) Site* LANL (c) Unit* TSTA (d) Report Date 1/01/01 Mo.Da.Yr.

(e) Occurrence Title

(f) Report Status: x New _ Change (g) Previous Report Date 1/01/01 Mo.Da.Yr.

(h) Related Reports: UOR Other

(i) Event Date 10/04/84 Mo.Da.Yr. Event Time : : 0 hrs.

2. EVENT NARRATIVE

INSTRUMENT IS UNSTABLE.

3. EVENT DETECTION/IMMEDIATE ACTION

(a) Det. Date (Mo./Da./Yr.) 10/04/84

Det. Time : : 0 hrs.

(b) Method of Detection*

(c) Time Detection to Initial Action 0

(d) Operating Status: Unit* System*

Subsystem*

(e) Initial (Immediate) Action

4. COMPONENT FAILURE DATA

(a) Component Name* eheater (b) CREDO ID No.* - -

(c) Site ID No.* (d) System* TRITIUM

(e) Subsystem* TWT

(f) Component Description RMA MONITOR

(g) Failure Type*

(h) Failure Mode*

(i) Failure Cause*

(j) x Primary _ Secondary

(k) Failure Cause Narrative

(l) Failure Effects: System (Hrs. Lost = 0)

Unit (Hrs. Lost = 0)

Other Items Affected

(m) Critical Parts

---

5. CORRECTIVE ACTION

(a) Maintenance Action

(b) Admin. Action

(c) Interim

(d) Final

---

6. HUMAN INTERACTION DATA

(a) Human Initiator? _ yes _ no If yes, explain _____

(b) Human Interaction/Engineering Potential _____

7. MAINTENANCE DATA

(a) Restoration Time (Hours/Manhours): (i) Total / 0

(ii) Administrative / 0 (iii) Logistics / 0

(iv) Indirect Repair / 0 (v) Direct Repair / 0

(vi) Retest / 0 (vii) Restart / 0

(b) Time Since Last (i) Maintenance (ii) Testing

(c) Maintenace Narrative

8. REMARKS

9. SIGNATURES:	Last Name, Initials	Signature	Site Phone No.
System Designer			
CREDO			

CREDO OPERATING DATA REPORTING FORM

1. REPORT IDENTIFICATION (a) CREDO Report ID No. _____

Site* _____ Unit* _____ Report Date ___/___/___ Mo. Da. Yr.

Report Period Start Date ___/___/___ Mo. Da. Yr. Report Period End Date ___/___/___ Mo. Da. Yr.

2. OPERATING TIMES (HOURS)

MODE-1	Normal Operations	_____
MODE-2	Limited Operations	_____
MODE-3	Shutdown Operations	_____

3. NUMBER CREDO EVENT REPORTS THIS REPORTING PERIOD FOR THIS UNIT: _____

4. FACILITY AVAILABILITY DATA

Design Output** _____ This Report Period** _____

Report Period Total Output** _____

Outages:	Number	Hours Expended
Scheduled	_____	_____
Unscheduled	_____	_____

Comments/Discussion _____

_____

For Test Facilities:

Number of Transients or Cycles This Period _____

Total Hours at Transient or Cyclic Conditions _____

5. SIGNATURES: Last Name, Initials Signature Site Phone No.

System Engineer _____ _____ _____

TPEMO _____ _____ _____

Form Operating Data Report Number _____

Appendix C: Table Definitions and Examples

1. Base Engineering Data

SUPPFORM.ITB

```
Table name    : SUPPFORM
File name     : A:SUPPFORM.ITB
Read  Access  : A.............
Write Access  : A.............$.
Creation Date      :  07/23/85
Modification Date  :  07/24/85
Number of Records  :       201

     ----------
Field : #MARK        LOGIC
Read  Access : A.............
Write Access : A.............
Picture :  (default)

     ----------
Field : COMPNAME     STR  30
Read  Access : A.............
Write Access : A.............
Picture : "rrrrrrrrrrrrrrrrrrrrrrrrrrrrrr"

     ----------
Field : SUPPFORM     STR  30
Read  Access : A.............
Write Access : A.............
Picture : "rrrrrrrrrrrrrrrrrrrrrrrrrrrrrr"

     ----------
Field : PARAMID#     STR  15
Read  Access : A.............
Write Access : A.............
Picture : "rrrrrrrrrrrrrr"

     ----------
Field : CREDOID#     STR  10
Read  Access : A.............
Write Access : A.............
Picture : "aa-dddd-dd"

     ----------
```

```
Record Number: 1

COMPNAME: HEATER 2
SUPPFORM: ELECTRIC HEATERS
PARAMID#: TWT-W-HTR2
CREDOID#: EH-0001-01
```

COMPSPEC ITB

```
Table name    : COMPSPEC
File name     : A:COMPSPEC.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  07/23/85
Modification Date :  07/29/85
Number of Records :       201

     ----------
Field : #MARK        LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : PPS          LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------     -
Field : MANUFACT     STR  30
Read  Access : A.................
Write Access : A.................
Picture : "%30r"

     ----------
Field : CODE         STR  4
Read  Access : A.................
Write Access : A.................
Picture : "cccc"

     ----------
Field : SPECSTNO     STR  16
Read  Access : A.................
Write Access : A.................
Picture : "ccc-cc-ccc-c,ccc"

     ----------
Field : SAFEQC       NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddddddddd"

     ----------
Field : DRWGNUM      STR  10
Read  Access : A.................
Write Access : A.................
Picture : "cccccccccc"

     ----------
Field : SITE         LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Field : MFG          LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : DATEIN       NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd-dd-dd"

     ----------
Field : MODIFIC      NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd-dd-dd"

     ----------
Field : REMOVAL      NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd-dd-dd"

     ----------
Field : CREDOID      STR  10
Read  Access : A.................
Write Access : A.................
Picture : "aa-dddd-dd"

     ----------
```

```
Record Number: 1

PPS:        TRUE
MANUFACT:
CODE:
SPECSTNO:      -  -    - ,
SAFEQC:                 0
DRWGNUM:
SITE:       FALSE
MFG:        FALSE
DATEIN:       -  - 0
MODIFIC:      -  - 0
REMOVAL:      -  - 0
CREDOID:   EH-0001-01
```

DESIGNS ITB

```
Table name    : DESIGNS
File name     : A:DESIGNS.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  07/23/85
Modification Date :  07/31/85
Number of Records :       200

     ----------
Field : #MARK        LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : CREDOID      STR  10
Read  Access : A.................
Write Access : A.................
Picture : "aa-dddd-dd"

     ----------
Field : CRITSYS      LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : DESFUNC      STR  60
Read  Access : A.................
Write Access : A.................
Picture : "%60r"

     ----------
Field : APPLICAT     STR  60
Read  Access : A.................
Write Access : A.................
Picture : "%60r"

     ----------
Field : DESLIFE      NUM
Read  Access : A.................
Write Access : A.................
Picture : "dddddd.dd"

     ----------
Field : DESLIFEC     NUM
Read  Access : A.................
Write Access : A.................
Picture : "dddddd.dd"

     ----------
```

```
Record Number: 1

CREDOID:  EH-0001-01
CRITSYS:  FALSE
DESFUNC:  Provide Heat
APPLICAT: Regeneration of Mole Sieve Bed
DESLIFE:        0.00
DESLIFEC:       0.00
```

OPDUTY ITB

```
Table name    : OPDUTY
File name     : A:OPDUTY.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  07/23/85
Modification Date :  07/29/85
Number of Records :       200

     ----------
Field : #MARK        LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : CREDOID      STR  10
Read  Access : A.................
Write Access : A.................

Picture : "aa-dddd-dd"

     ----------
Field : NORMOP       NUM
Read  Access : A.................
Write Access : A.................
Picture :  [illegible]

     ----------
Field : DEGOP        NUM
Read  Access : A.................
Write Access : A.................
Picture :  [illegible]

     ----------
Field : SHUTOP       NUM
Read  Access : A.................
Write Access : A.................
Picture :  [illegible]

     ----------
Field : NORMCY       NUM
Read  Access : A.................
Write Access : A.................
Picture :  [illegible]

     ----------
Field : DEGCY        NUM
Read  Access : A.................
Write Access : A.................
Picture :  [illegible]

     ----------
Field : SHUTCY       NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddddd.dddd"

     ----------
```

```
Record Number: 1

CREDOID:  EH-0001-01
NORMOP:   0.0000
DEGOP:    0.0000
SHUTOP:   0.0000
NORMCY:   0.0000
DEGCY:    0.0000
SHUTCY:   0.0000
```

MAININSP ITB

```
Table name    : MAININSP
File name     : A:MAININSP.ITB
Read  Access  : A.................
Write Access  : A.................
Creation Date      :  07/23/85
Modification Date  :  08/02/85
Number of Records  :       200

     ----------
Field : #MARK        LOGIC
Read  Access  : A.................
Write Access  : A.................
Picture :  (default)

     ----------
Field : CREDOID      STR  10
Read  Access  : A.................
Write Access  : A.................
Picture : "aa-dddd-dd"

     ----------
Field : MAININTY     STR  60
Read  Access  : A.................
Write Access  : A.................
Picture : "%60r"

     ----------
Field : INSPTIT      STR  60
Read  Access  : A.................
Write Access  : A.................
Picture : "%60r"

     ----------
```

```
Record Number: 1

CREDOID:  EH-0001-01
MAININTY:
INSPTIT:
```

ENVIRON ITB

```
Table name    : ENVIRON
File name     : A:ENVIRON.ITB
Read  Access  : A.................
Write Access  : A.................
Creation Date      :  07/23/85
Modification Date  :  07/29/85
Number of Records  :       200

     ----------
Field : #MARK        LOGIC
Read  Access  : A.................
Write Access  : A.................
Picture :  (default)

     ----------
Field : CREDOID      STR  10
Read  Access  : A.................
Write Access  : A.................
Picture : "aa-dddd-dd"

     ----------
Field : NFLUX        NUM
Read  Access  : A.................
Write Access  : A.................
Picture : "ddddd.dddd"

     ----------
Field : TRITENV      NUM
Read  Access  : A.................
Write Access  : A.................
Picture : "ddddd.ddd"

     ----------
```

```
Record Number: 1

CREDOID:  EH-0001-01
NFLUX:          0.0000
TRITENV:        0.000
```

REMARKS ITB

```
Table name    : REMARKS
File name     : A:REMARKS.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  07/23/85
Modification Date :  07/31/85
Number of Records :        200

     ----------
Field : #MARK        LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : CREDOID      STR  10
Read  Access : A.................
Write Access : A.................
Picture : "aa-dddd-dd"

     ----------
Field : REMARKS   " STR  300
Read  Access : A.................
Write Access : A.................
Picture : "%300r"

     ----------
```

```
Record Number: 1

CREDOID:  EH-0001-01
REMARKS:
```

Appendix C: Table Definitions and Examples

2. Supplemental Engineering Data

EHEATER ITB

```
Table name    : EHEATER
File name     : A:EHEATER.ITB
Read  Access : A.....
Write Access : A.....
Creation Date      :  08/07/85
Modification Date :  01/01/80
Number of Records :        1

     ----------
Field : #MARK        LOGIC
Read  Access : A.....
Write Access : A.....
Picture :  (default)

     ----------
Field : TWORD        STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : FWORD        STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : HWORD        STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : HAWORD       STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : HDWORD       STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : CWORD        STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : PWORD        STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : DWORD        STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : CPRATE       NUM
Read  Access : A.....
Write Access : A.....
Picture : "ddd.d"

     ----------
Field : DCURRENT     NUM
Read  Access : A.....
Write Access : A.....
Picture : "ddd.d"

     ----------
Field : DESFREQ      NUM
Read  Access : A.....
Write Access : A.....
Picture : "ddd.d"

     ----------
Field : DESRES       NUM
Read  Access : A.....
Write Access : A.....
Picture : "ddd.d"

     ----------
Field : DESVOLT      NUM
Read  Access : A.....
Write Access : A.....
Picture : "ddd.d"

     ----------
Field : MAXDTEMP     NUM
Read  Access : A.....
Write Access : A.....
Picture : "ddd.d"

     ----------
Field : WIRESIZE     NUM
Read  Access : A.....
Write Access : A.....
Picture : "ddd.d"

     ----------
```

```
Record Number: 1

TWORD:      INDUCT
FWORD:      SPACE
HWORD:      RADFAN
HAWORD:     EVAPOR
HDWORD:     OTHER
CWORD:      AUTOSENS
PWORD:      AC
DWORD:      CONTIN
CPRATE:      12.0
DCURRENT:    12.0
DESFREQ:     12.0
DESRES:      12.0
DESVOLT:     12.8
MAXDTEMP:    12.0
WIRESIZE:    12.0
```

EHEAT ITB

```
Table name    : EHEAT
File name     : A:EHEAT.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  08/07/85
Modification Date :  01/01/80
Number of Records :         0

     ----------
Field : #MARK        LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : FWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : HWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : HAWORD       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : HDWORD       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : CWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : PWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : DWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : CPRATE       NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.d"

     ----------
Field : DCURRENT     NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.d"

     ----------
Field : DESFREQ      NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.d"

     ----------
Field : DESRES       NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.d"

     ----------
Field : DESVOLT      NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.d"

     ----------
Field : MAXDTEMP     NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.d"

     ----------
Field : WIRESIZE     NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.d"

     ----------
```

```
Record Number: 1

TWORD:      none
FWORD:
HWORD:
HAWORD:
HDWORD:
CWORD:
FWORD:
DWORD:
CPRATE:      0.0
DCURRENT:    0.0
DESFREQ:     0.0
DESRES:      0.0
DESVOLT:     0.0
MAXDTEMP:    0.0
WIRESIZE:    0.0
```

FILTER ITB

Table name : FILTER
File name : A:FILTER.ITB
Read Access : A.....
Write Access : A.....
Creation Date : 08/06/85
Modification Date : 01/01/80
Number of Records : 1

Field : #MARK LOGIC
Read Access : A.....
Write Access : A.....
Picture : (default)

Field : TWORD STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : MEDPRO STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : FILMECH STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : DRIVMECH STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : FILMAT STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : BODYMAT STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : DESGASFR NUM
Read Access : A.....
Write Access : A.....
Picture : "ddd.dd"

Field : DESLIQFR NUM
Read Access : A.....
Write Access : A.....
Picture : "ddd.dd"

Field : DESPRESS NUM
Read Access : A.....
Write Access : A.....
Picture : "ddd.dd"

Field : DESTEMP NUM
Read Access : A.....
Write Access : A.....
Picture : "ddd.dd"

Field : FILMESH NUM
Read Access : A.....
Write Access : A.....
Picture : "ddd.dd"

Field : FILCAP NUM
Read Access : A.....
Write Access : A.....
Picture : "ddd.dd"

Field : INLET NUM
Read Access : A.....
Write Access : A.....
Picture : "ddd.dd"

Field : NOOPPRES NUM
Read Access : A.....
Write Access : A.....
Picture : "ddd.dd"

Field : NOOPTEMP NUM
Read Access : A.....
Write Access : A.....
Picture : "ddd.dd"

```
Field : NOPRESDR     NUM
Read  Access : A.............
Write Access : A.............
Picture : "ddd.dd"

     ----------
Field : OUTLET       NUM
Read  Access : A.............
Write Access : A.............
Picture : "ddd.dd"

     ----------
```

```
Record Number: 1

TWORD:     Chemical
MEDPRO:    LIGNA
FILMECH:   ES
DRIVMECH:  GRAVITY
FILMAT:    33333
BODYMAT:   33333
DESGASFR:  123.00
DESLIQFR:  123.00
DESPRESS:  123.00
DESTEMP:   123.00
FILMESH:   123.00
FILCAP:    123.00
INLET:     123.00
NOOPPRES:  123.00
NOOPTEMP:  123.00
NOPRESDR:  123.00
OUTLET:    123.00
```

FILSTR ITB

```
Table name    : FILSTR
File name     : A:FILSTR.ITB
Read  Access : A.............
Write Access : A.............
Creation Date      :  08/06/85
Modification Date  :  01/01/80
Number of Records  :         0

     ----------
Field : #MARK        LOGIC
Read  Access : A.............
Write Access : A.............
Picture :  (default)

     ----------
Field : TWORD        STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : MEDPRO       STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : FILMECH      STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : DRIVMECH     STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : FILMAT       STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : BODYMAT      STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
```

```
Field : DESGASFR     NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.dd"

     ----------
Field : DESLIQFR     NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.dd"

     ----------
Field : DESPRESS     NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.dd"

     ----------
Field : DESTEMP      NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.dd"

     ----------
Field : FILMESH      NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.dd"

     ----------
Field : FILCAP       NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.dd"

     ----------
Field : INLET        NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.dd"

     ----------
Field : NOOPPRES     NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.dd"

     ----------
Field : NOOPTEMP     NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.dd"

     ----------
```

```
Field : NOPRESDR     NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.dd"

     ----------
Field : OUTLET       NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd.dd"

     ----------
```

```
Record Number: 1

TWORD:     none
MEDPRO:
FILMECH:
DRIVMECH:
FILMAT:
BODYMAT:
DESGASFR:    0.00
DESLIQFR:    0.00
DESPRESS:    0.00
DESTEMP:     0.00
FILMESH:     0.00
FILCAP:      0.00
INLET:       0.00
NOOPPRES:    0.00
NOOPTEMP:    0.00
NOPRESDR:    0.00
OUTLET:      0.00
```

GAS ITB

```
Table name    : GAS
File name     : A:GAS.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  08/21/85
Modification Date :  01/01/80
Number of Records :        1

     ----------
Field : #MARK         LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TWORD         STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : MEDPRO        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : NOOPRESS      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : NOOPTEMP      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OUTLET        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : CYCTIME       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : DESCAP        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : DESPRESS      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : DESTEMP       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

Record Number: 1

TWORD:	none
MEDPRO:	
CYCTIME:	0.00000
DESCAP:	0.00000
DESPRESS:	0.00000
DESTEMP:	0.00000
NOOPRESS:	0.00000
NOOPTEMP:	0.00000
OUTLET:	0.00000

GASDRY ITB

```
Table name    : GASDRY
File name     : A:GASDR~.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  08/21/85
Modification Date  :  01/01/80
Number of Records  :         0

     ----------
Field : #MARK         LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TWORD         STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : MEDPRO        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : CYCTIME       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : DESCAP        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : DESPRESS      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : DESTEMP       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Field : NOOPRESS      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : NOOPTEMP      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OUTLET        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Record Number: 1

TWORD:      CENTRIFU
MEDPRO:     ARGON
CYCTIME:        1234.00000
DESCAP:           23.00000
DESPRESS:         23.70000
DESTEMP:          12.00000
NOOPRESS:         12.00000
NOOPTEMP:        234.00000
OUTLET:          321.00000
```

GASM ITB

```
Table name    : GASM
File name     : A:GASM.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  03/21/85
Modification Date :  01/01/80
Number of Records :        1

     ----------
Field : #MARK         LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TYWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : DTWORD      - STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : DWORD         STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : GTWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : DRATE         NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : FRATE         NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Field : NOMOPPR       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : ROTVEL        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MAXOP         NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MAXV          NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Record Number: 1

TYWORD:    CIRCULTR
DTWORD:    AXIAL
DWORD:     ACMOTOR
GTWORD:    AIR
DRATE:              123.00000
FRATE:              123.00000
NOMOPPR:            123.00000
ROTVEL:             123.00000
MAXOP:              123.00000
MAXV:               123.00000
```

GASMOV ITB

```
Table name    : GASMOV
File name     : A:GASMOV.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  08/21/85
Modification Date :  01/01/80
Number of Records :         0

     ----------
Field : #MARK         LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TYWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : DTWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : DWORD         STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : GTWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : DRATE         NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : FRATE         NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Field : NOMOPPR       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : ROTVEL        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MAXOP         NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MAXV          NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Record Number: 1

TYWORD:    none
DTWORD:
DWORD:
GTWORD:
DRATE:                0.00000
FRATE:                0.00000
NOMOPPR:              0.00000
ROTVEL:               0.00000
MAXOP:                0.00000
MAXV:                 0.00000
```

INCONTLR ITB

```
Table name    : INCONTLR
File name     : A:INCONTLR.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  08/22/85
Modification Date :  01/01/80
Number of Records :         1

     ----------
Field : #MARK         LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TWORD         STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : MCSEN         STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : CONPARA       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : OPFUN         STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : CONDRIV       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : MAXTEMP       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Field : MASLEV        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TCRANGE       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MINTEMP       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : NSSLEV        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MILEV         NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Record Number: 1

TWORD:     ELECTRIC
MCSEN:     ELECTRIC
CONPARA:   ANGDIS
OPFUN:     EXPON
CONDRIV:   VARFQ
MAXTEMP:          123.00000
MASLEV:           123.00000
TCRANGE:          123.00000
MINTEMP:          123.00000
NSSLEV:           123.00000
MILEV:             12.00000
```

CONTROL ITB

```
Table name    : CONTROL
File name     : A:CONTROL.ITB
Read  Access : A.....
Write Access : A.....
Creation Date      :  08/22/85
Modification Date :  01/01/80
Number of Records :        0

     ----------
Field : #MARK        LOGIC
Read  Access : A.....
Write Access : A.....
Picture :  (default)

     ----------
Field : TWORD        STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : MCSEN        STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : CONPARA      STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : OPFUN        STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : CONDRIV      STR  8
Read  Access : A.....
Write Access : A.....
Picture : "%8r"

     ----------
Field : MAXTEMP      NUM
Read  Access : A.....
Write Access : A.....
Picture :  (default)

     ----------
Field : MASLEV       NUM
Read  Access : A.....
Write Access : A.....
Picture :  (default)

     ----------
Field : TCRANGE      NUM
Read  Access : A.....
Write Access : A.....
Picture :  (default)

     ----------
Field : MINTEMP      NUM
Read  Access : A.....
Write Access : A.....
Picture :  (default)

     ----------
Field : NSSLEV       NUM
Read  Access : A.....
Write Access : A.....
Picture :  (default)

     ----------
Field : MILEV        NUM
Read  Access : A.....
Write Access : A.....
Picture :  (default)

     ----------
```

```
Record Number: 1

TWORD:     none
MCSEN:
CONPARA:
OPFUN:
CONDRIV:
MAXTEMP:              0.00000
MASLEV:               0.00000
TCRANGE:              0.00000
MINTEMP:              0.00000
NSSLEV:               0.00000
MILEV:                0.00000
```

MECPUM ITB

```
Table name    : MECPUM
File name     : A:MECPUM.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  01/01/80
Modification Date :  01/01/80
Number of Records :        1

     ----------
Field : #MARK        LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : DWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : SCWORD       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : MAWORD       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : MPWORD       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : SSWORD       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
```

```
Field : IMWORD       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : IMMAT        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : CASMAT       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : CAPAC        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : DRIAMP       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : DRIVOLT      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : INLET        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MAXFLO       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MAXFRE       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Field : MAXMED        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MAXPRES       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MINFLO        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MINFRE        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MINMED        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OPHEAD        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OPFLOW        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OPPRES        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OPSPED        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Field : OPTEMP        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OUTLET        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Record Number: 1

TWORD:     GEAR
DWORD:     WNDROTOR
SCWORD:    MAGCPLE
MAWORD:    VERTICAL
MPWORD:    GAS
SSWORD:    MECH
IMWORD:    DSMS
IMMAT:
CASMAT:
CAPAC:                0.00000
DRIAMP:               0.00000
DRIVOLT:              0.00000
INLET:                0.00000
MAXFLO:               0.00000
MAXFRE:               0.00000
MAXMED:               0.00000
MAXPRES:              0.00000
MINFLO:               0.00000
MINFRE:               0.00000
MINMED:               0.00000
OPHEAD:               0.00000
OPFLOW:               0.00000
OPPRES:               0.00000
OPSPED:               0.00000
OPTEMP:               0.00000
OUTLET:               0.00000
```

MEPUMP ITB

Table name : MEPUMP
File name : A:MEPUMP.ITB
Read Access : A.....
Write Access : A.....
Creation Date : 01/01/80
Modification Date : 01/01/80
Number of Records : 0

Field : #MARK LOGIC
Read Access : A.....
Write Access : A.....
Picture : (default)

Field : TWORD STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : DWORD STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : SCWORD STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : MAWORD STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : MPWORD STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : SSWORD STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : IMWORD STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : IMMAT STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : CASMAT STR 8
Read Access : A.....
Write Access : A.....
Picture : "%8r"

Field : CAPAC NUM
Read Access : A.....
Write Access : A.....
Picture : (default)

Field : DRIAMP NUM
Read Access : A.....
Write Access : A.....
Picture : (default)

Field : DRIVOLT NUM
Read Access : A.....
Write Access : A.....
Picture : (default)

Field : INLET NUM
Read Access : A.....
Write Access : A.....
Picture : (default)

Field : MAXFLO NUM
Read Access : A.....
Write Access : A.....
Picture : (default)

Field : MAXFRE NUM
Read Access : A.....
Write Access : A.....
Picture : (default)

```
Field : MAXMED       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MAXPRES      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MINFLO       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MINFRE       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MINMED       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OPHEAD       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OPFLOW       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OPPRES       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OPSPED       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Field : OPTEMP       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : OUTLET       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Record Number: 1

TWORD:     none
DWORD:
SCWORD:
MAWORD:
MPWORD:
SSWORD:
IMWORD:
IMMAT:
CASMAT:
CAPAC:                0.00000
DRIAMP:               0.00000
DRIVOLT:              0.00000
INLET:                0.00000
MAXFLO:               0.00000
MAXFRE:               0.00000
MAXMED:               0.00000
MAXPRES:              0.00000
MINFLO:               0.00000
MINFRE:               0.00000
MINMED:               0.00000
OPHEAD:               0.00000
OPFLOW:               0.00000
OPPRES:               0.00000
OPSPED:               0.00000
OPTEMP:               0.00000
OUTLET:               0.00000
```

NNCR ITB

```
Table name   : NNCR
File name    : A:NNCR.ITB
Read  Access : A.................
Write Access : A.................
Creation Date     :  01/01/80
Modification Date :  01/01/80
Number of Records :        1

     ----------
Field : #MARK        LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : MEDMON       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : SENTYPE      STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : AFSCALE      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : ATMAX        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : ATMIN        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Field : MAXOPT       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MINOPT       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : NOMSEN       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : RRTIME       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : SENOPT       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : CWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
```

```
Record Number: 1

TWORD:     OTHER
MEDMON:    LIGHT
SENTYPE:   MAGFIELD
AFSCALE:              0.00000
ATMAX:                0.00000
ATMIN:                0.00000
MAXOPT:               0.00000
MINOPT:               0.00000
NOMSEN:               0.00000
RRTIME:               0.00000
SENOPT:               0.00000
CWORD:     MULTI
```

NONUSEN ITB

```
Table name    : NONUSEN
File name     : A:NONUSEN.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  01/01/80
Modification Date :  01/01/80
Number of Records :        0

     ----------
Field : #MARK        LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : MEDMON       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : SENTYPE      STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : AFSCALE      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : ATMAX        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : ATMIN        NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MAXOPT       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MINOPT       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : NOMSEN       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : RRTIME       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : SENOPT       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : CWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
```

```
Record Number: 1

TWORD:     none
MEDMON:
SENTYPE:
AFSCALE:            0.00000
ATMAX:              0.00000
ATMIN:              0.00000
MAXOPT:             0.00000
MINOPT:             0.00000
NOMSEN:             0.00000
RRTIME:             0.00000
SENOPT:             0.00000
CWORD:
```

NDETE ITB

```
Table name   : NDETE
File name    : A:NDETE.ITB
Read  Access : A.............
Write Access : A.............
Creation Date     :  08/29/85
Modification Date :  08/29/85
Number of Records :        1

     ----------
Field : #MARK        LOGIC
Read  Access : A.............
Write Access : A.............
Picture :  (default)

     ----------
Field : TWORD        STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : RDWORD       STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : PWORD        STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : SMWORD       STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : SEWORD       STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : STWORD       STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
```

```
Field : RSWORD       STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : FWORD        STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : DESSENA      NUM
Read  Access : A.............
Write Access : A.............
Picture :  (default)

     ----------
Field : DESSENV      NUM
Read  Access : A.............
Write Access : A.............
Picture :  (default)

     ----------
Field : MAXCURR      NUM
Read  Access : A.............
Write Access : A.............
Picture :  (default)

     ----------
Field : MAXVOLT      NUM
Read  Access : A.............
Write Access : A.............
Picture :  (default)

     ----------
```

```
Record Number: 1

TWORD:     SCINTILL
RDWORD:    NONTNEUT
PWORD:     PROCMON
SMWORD:    UNCOMP
SEWORD:    SSCOND
STWORD:    ISOTORAT
RSWORD:    NO
FWORD:     SOURCE
DESSENA:        1234.00000
DESSENV:        2345.56000
MAXCURR:          66.67000
MAXVOLT:           3.78000
```

NUCD ITB

```
Table name    : NUCD
File name     : A:NUCD.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  08/29/85
Modification Date :  08/29/85
Number of Records :        0

     ----------
Field : #MARK         LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TWORD         STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : RDWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : PWORD         STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : SMWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : SEWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : STWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
```

```
Field : RSWORD        STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : FWORD         STR  8
Read  Access : A.................
Write Access : A.................
Picture : "%8r"

     ----------
Field : DESSENA       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : DESSENV       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MAXCURR       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : MAXVOLT       NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
```

```
Record Number: 1

TWORD:      none
RDWORD:
PWORD:
SMWORD:
SEWORD:
STWORD:
RSWORD:
FWORD:
DESSENA:              0.00000
DESSENV:              0.00000
MAXCURR:              0.00000
MAXVOLT:              0.00000
```

PIPEF ITB

```
Table name   : PIPEF
File name    : PIPEF.ITB
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Creation Date     :  01/04/80
Modification Date :  01/04/80
Number of Records :        1

     ----------
Field : #MARK        LOGIC
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : FTYPE        STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : MEDPRO       STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : PSCHED       STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : BASEMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : BENDANGL     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : MAXPRESS     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : MAXTEMP      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOMFLOW      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOMFLOWU     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : NOMLINFT     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPPRESS     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPTEMP      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOMSIZE      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : RADCURV      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : REDUCINL     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
```

```
Field : REDUCINS     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
```

```
Record Number: 1

FTYPE:     none
MEDPRO:
PSCHED:
BASEMAT:
BENDANGL:          0.00000
MAXPRESS:          0.00000
MAXTEMP:           0.00000
NOMFLOW:           0.00000
NOMFLOWU:
NOMLINFT:          0.00000
NOPPRESS:          0.00000
NOPTEMP:           0.00000
NOMSIZE:           0.00000
RADCURV:           0.00000
REDUCINL:          0.00000
REDUCINS:          0.00000
```

PIPEFITS ITB

```
Table name    : PIPEFITS
File name     : PIPEFITS.ITB
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Creation Date      :  01/04/80
Modification Date :  01/04/80
Number of Records :         0

     ----------
Field : #MARK        LOGIC
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : FTYPE        STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : MEDPRO       STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : PSCHED       STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : BASEMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : BENDANGL     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : MAXPRESS     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
```

```
Field : MAXTEMP      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOMFLOW      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOMFLOWU     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : NOMLINFT     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPPRESS     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPTEMP      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOMSIZE      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : RADCURV      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : REDUCINL     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
```

```
Field : REDUCINS     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
```

```
Record Number: 1

FTYPE:      none
MEDPRO:
PSCHED:
BASEMAT:
BENDANGL:          0.00000
MAXPRESS:          0.00000
MAXTEMP:           0.00000
NOMFLOW:           0.00000
NOMFLOWU:
NOMLINFT:          0.00000
NOPPRESS:          0.00000
NOPTEMP:           0.00000
NOMSIZE:           0.00000
RADCURV:           0.00000
REDUCINL:          0.00000
REDUCINS:          0.00000
```

PVES ITB

```
Table name    : PVES
File name     : PVES.ITB
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Creation Date      :  01/04/80
Modification Date :  01/04/80
Number of Records :        1

     ----------
Field : #MARK         LOGIC
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : TWORD         STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : SHAPE         STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : MEDPRO        STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : TANKBM        STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : TANKLM        STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : LINERTHK      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : MAXPRESS      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : MAXTEMP       NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOMFLOW       NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPPRESS      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPTEMP       NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : TANKGVOL      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : TANKLVOL      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : TANKTHK       NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
```

```
Record Number: 1

TWORD:      ACUMLATR
SHAPE:      CUBIC
MEDPRO:     CHEM
TANKBM:
TANKLM:
LINERTHK:          1.00000
MAXPRESS:          1.00000
MAXTEMP:           1.00000
NOMFLOW:           1.00000
NOPPRESS:          1.00000
NOPTEMP:           1.00000
TANKGVOL:          1.00000
TANKLVOL:          1.00000
TANKTHK:           1.00000
```

PRESV ITB

```
Table name    : PRESV
File name     : PRESV.ITB
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Creation Date      :  01/04/80
Modification Date :  01/04/80
Number of Records :        2

     ----------
Field : #MARK        LOGIC
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : TWORD        STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : SHAPE        STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : MEDPRO       STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : TANKBM       STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : TANKLM       STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : LINERTHK     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : MAXPRESS     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : MAXTEMP      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOMFLOW      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPPRESS     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPTEMP      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : TANKGVOL     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : TANKLVOL     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : TANKTHK      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
```

```
Record Number: 1

TWORD:      ACUMLATR
SHAPE:      CUBIC
MEDPRO:     CHEM
TANKBM:
TANKLM:
LINERTHK:          1.00000
MAXPRESS:          1.00000
MAXTEMP:           1.00000
NOMFLOW:           1.00000
NOPPRESS:          1.00000
NOPTEMP:           1.00000
TANKGVOL:          1.00000
TANKLVOL:          1.00000
TANKTHK:           1.00000
```

RECB ITB

Table name : RECB
File name : RECB.ITB
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Creation Date : 01/04/80
Modification Date : 01/04/80
Number of Records : 1

Field : #MARK LOGIC
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : (default)

Field : TWORD STR 8
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

Field : IAGENT STR 8
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

Field : MEDPRO STR 8
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

Field : CAPAGENT NUM
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : (default)

Field : CAPAGTUN STR 8
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

Field : CAPMED NUM
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : (default)

Field : CAPMEDUN STR 8
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

Field : DESHTRAT NUM
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : (default)

Field : DESPRESS NUM
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : (default)

Field : FLOWRATE NUM
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : (default)

Field : FLOWRTUN STR 8
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

Field : MAXFRATE NUM
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : (default)

Field : MAXFRTUN STR 8
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

Field : MINFRATE NUM
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : (default)

Field : MINFRTUN STR 8
Read Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

```
Field : OPHTRATE     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPPRESS      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPTEMP       NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : COMPMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
```

```
Record Number: 1

TWORD:     none
IAGENT:
MEDPRO:
CAPAGENT:          0.00000
CAPAGTUN:
CAPMED:            0.00000
CAPMEDUN:
DESHTRAT:          0.00000
DESPRESS:          0.00000
FLOWRATE:          0.00000
FLOWRTUN:
MAXFRATE:          0.00000
MAXFRTUN:
MINFRATE:          0.00000
MINFRTUN:
OPHTRATE:          0.00000
OPPRESS:           0.00000
OPTEMP:            0.00000
COMPMAT:
```

RECOMBS ITB

```
Table name   : RECOMBS
File name    : RECOMBS.ITB
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Creation Date     :  01/04/80
Modification Date :  01/04/80
Number of Records :        0

     ----------
Field : #MARK        LOGIC
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : TWORD        STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : IAGENT       STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : MEDPRO       STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : CAPAGENT     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : CAPAGTUN     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : CAPMED       NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
```

```
Field : CAPMEDUN     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : DESHTRAT     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : DESPRESS     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : FLOWRATE     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : FLOWRTUN     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : MAXFRATE     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : MAXFRTUN     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : MINFRATE     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : MINFRTUN     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
```

```
Field : OPHTRATE     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPPRESS      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPTEMP       NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : COMPMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
```

```
Record Number: 1

TWORD:     none
IAGENT:
MEDPRO:
CAPAGENT:            0.00000
CAPAGTUN:
CAPMED:              0.00000
CAPMEDUN:
DESHTRAT:            0.00000
DESPRESS:            0.00000
FLOWRATE:            0.00000
FLOWRTUN:
MAXFRATE:            0.00000
MAXFRTUN:
MINFRATE:            0.00000
MINFRTUN:
OPHTRATE:            0.00000
OPPRESS:             0.00000
OPTEMP:              0.00000
COMPMAT:
```

VALVS ITB

```
Table name    : VALVS
File name     : VALVS.ITB
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Creation Date      :  01/04/80
Modification Date :  01/04/80
Number of Records :        1

     ----------
Field : #MARK         LOGIC
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : VTYPE         STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : FUNCTAPP      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : FUNCTCHR      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : MEDPRO        STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : SEAL          STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : OPTYPE        STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : VALVCONN      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : DESPRESS      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : DESTEMP       NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPPRESS      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPTEMP       NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NPIPESIZ      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NVALVESI      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NVALVSTR      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPACTFOR      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
```

```
Field : OPACTTIM     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPACTTRQ     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPMOTORR     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPMOTORV     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPMOTORU     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : PRESTOOP     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : TANKMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : BODYMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : PIPEMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
```

```
Field : SEATMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
```

```
Record Number: 1

VTYPE:     none
FUNCTAPP:
FUNCTCHR:
MEDPRO:
SEAL:
OPTYPE:
VALVCONN:
DESPRESS:            0.00000
DESTEMP:             0.00000
NOPPRESS:            0.00000
NOPTEMP:             0.00000
NPIPESIZ:            0.00000
NVALVESI:            0.00000
NVALVSTR:            0.00000
OPACTFOR:            0.00000
OPACTTIM:            0.00000
OPACTTRQ:            0.00000
OPMOTORR:            0.00000
OPMOTORV:            0.00000
OPMOTORU:
PRESTOOP:            0.00000
TANKMAT:
BODYMAT:
PIPEMAT:
SEATMAT:
```

VALV ITB

```
Table name   : VALV
File name    : VALV.ITB
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Creation Date     :  01/04/80
Modification Date :  01/04/80
Number of Records :        0

     ----------
Field : #MARK        LOGIC
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : VTYPE        STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : FUNCTAPP     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : FUNCTCHR     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : MEDPRO       STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : SEAL         STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : OPTYPE       STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : VALVCONN     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : DESPRESS     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : DESTEMP      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPPRESS     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NOPTEMP      NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NPIPESIZ     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NVALVESI     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : NVALVSTR     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPACTFOR     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
```

```
Field : OPACTTIM     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPACTTRQ     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPMOTORR     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPMOTORV     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : OPMOTORU     STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : PRESTOOP     NUM
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture :  (default)

     ----------
Field : TANKMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : BODYMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
Field : PIPEMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
```

```
Field : SEATMAT      STR  8
Read  Access : ABCDEFGHIJKLMNOP
Write Access : ABCDEFGHIJKLMNOP
Picture : "%8r"

     ----------
```

```
Record Number: 1                    more

VTYPE:      none
FUNCTAPP:
FUNCTCHR:
MEDPRO:
SEAL:
OPTYPE:
VALVCONN:
DESPRESS:              0.00000
DESTEMP:               0.00000
NOPPRESS:              0.00000
NOPTEMP:               0.00000
NPIPESIZ:              0.00000
NVALVESI:              0.00000
NVALVSTR:              0.00000
OPACTFOR:              0.00000
OPACTTIM:              0.00000
OPACTTRQ:              0.00000
OPMOTORR:              0.00000
OPMOTORV:              0.00000
OPMOTORU:
PRESTOOP:              0.00000
TANKMAT:
BODYMAT:
PIPEMAT:
SEATMAT:
```

Appendix C: Table Definitions and Examples

3. Event Data

MAINT ITB

```
Table name    : MAINT
File name     : A:MAINT.ITB
Read  Access : A.............
Write Access : A.............
Creation Date      :  06/17/85
Modification Date :  08/20/85
Number of Records :       27

     ----------
Field : #MARK        LOGIC
Read  Access : A.............
Write Access : A.............
Picture :  (default)

     ----------
Field : REPTNUMR     STR  6
Read  Access : A.............
Write Access : A.............
Picture : "dddd-r"

     ----------
Field : EDATE        STR  10
Read  Access : A.............
Write Access : A.............
Picture : "%10r"

     ----------
Field : SBSYSTEM     STR  50
Read  Access : A.............
Write Access : A.............
Picture : "%50r"

     ----------
Field : CMPONENT     STR  50
Read  Access : A.............
Write Access : A.............
Picture : "%50r"

     ----------
Field : SERNUMBR     STR  50
Read  Access : A.............
Write Access : A.............
Picture : "%50r"

     ----------
Field : MODLNMBR     STR  50
Read  Access : A.............
Write Access : A.............
Picture : "%50r"

     ----------
Field : PROBLEM      STR  50
Read  Access : A.............
Write Access : A.............
Picture : "%50r"

     ----------
Field : CONFIG       STR  149
Read  Access : A.............
Write Access : A.............
Picture : "%149r"

     ----------
Field : PARAMTRS     STR  149
Read  Access : A.............
Write Access : A.............
Picture : "%149r"

     ----------
Field : DESCRIBE     STR  250
Read  Access : A.............
Write Access : A.............
Picture : "%250r"

     ----------
Field : STATUS       STR  50
Read  Access : A.............
Write Access : A.............
Picture : "%50r"

     ----------
Field : ORIGNATR     STR  50
Read  Access : A.............
Write Access : A.............
Picture : "%50r"

     ----------
Field : ACTNWAS      STR  50
Read  Access : A.............
Write Access : A.............
Picture : "%50r"

     ----------
Field : FAILCOMP     STR  69
Read  Access : A.............
Write Access : A.............
Picture : "%69r"

     ----------
Field : SPECPROB     STR  149
Read  Access : A.............
Write Access : A.............
Picture : "%149r"

     ----------
Field : CAUSE        STR  69
Read  Access : A.............
Write Access : A.............
Picture : "%69r"

     ----------
```

```
Field : CORRMNTC     STR  309
Read  Access : A.................
Write Access : A.................
Picture : "%309r"

     ----------
Field : MNTCEQIP     STR  149
Read  Access : A.................
Write Access : A.................
Picture : "%149r"

     ----------
Field : REQDTIME     STR  69
Read  Access : A.................
Write Access : A.................
Picture : "%69r"

     ----------
Field : WIERDCIR     STR  69
Read  Access : A.................
Write Access : A.................
Picture : "%69r"

     ----------
Field : VERMTHOD     STR  229
Read  Access : A.................
Write Access : A.................
Picture : "%229r"

     ----------
Field : COMPLETD     STR  8
Read  Access : A.................
Write Access : A.................
Picture : "rr/rr/rr"

     ----------
Field : COMPLTBY     STR  69
Read  Access : A.................
Write Access : A.................
Picture : "%69r"

     ----------
Field : OCCURTIT     STR  55
Read  Access : A.................
Write Access : A.................
Picture : "%55r"

     ----------
Field : ETIME        NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd:dd:dd"

     ----------
Field : CREQOID#     STR  10
Read  Access : A.................
Write Access : A.................
Picture : "rr-dddd-dd"
```

```
Record Number: 1          more data

REPTNUM:  [illegible]
DATE:     [illegible]
SUBSYSTEM: [illegible]
CMPONENT: ION CHAMBER
SERNUMER:
MODLNMBR:
PROBLEM:  HARDWARE
CONFIG:   OPERATIONAL

PARAMTRS: NORMAL (HIGH LEVELS >2000 Ci HAD BEEN PROCESSED IN TNT)

DESCRIBE: CHAMBER READING EXCESSIVELY HIGH AND WILL NOT CLEAN UP BY EVACUATING.


STATUS:   CLOSED
ORIGNATR: DAMIANO
ACTNWAS:  TAKEN
FAILCOMP:
SPECPROB:

CAUSE:

CORRMNTC:



MNTCEQIP:


REQDTIME:

WIERDCIR:

VERMTHOD:

COMPLETD:   /  /
COMPLTBY:

OCCURTIT:
ETIME:      :  : 0
CREQOID#:   -    -
```

SUPPFORM ITB

```
Table name    : SUPPFORM
File name     : A:SUPPFORM.ITB
Read  Access : A...............
Write Access : A...............
Creation Date      :  07/23/85
Modification Date :  08/15/85
Number of Records :       201

     ----------

Field : #MARK        LOGIC
Read  Access : A...............
Write Access : A...............
Picture :  (default)

     ----------
Field : COMPNAME     STR  30
Read  Access : A...............
Write Access : A...............
Picture : "rrrrrrrrrrrrrrrrrrrrrrrrrrrrrr"

     ----------
Field : SUPPFORM     STR  30
Read  Access : A...............
Write Access : A...............
Picture : "rrrrrrrrrrrrrrrrrrrrrrrrrrrrrr"

     ----------
Field : PARAMID#     STR  15
Read  Access : A...............
Write Access : A...............
Picture : "rrrrrrrrrrrrrrr"

     ----------
Field : CREDOID#     STR  10
Read  Access : A...............
Write Access : A...............
Picture : "aa-dddd-dd"

     ----------
```

```
Record Number: 1

COMPNAME: HEATER 2
SUPPFORM: ELECTRIC HEATERS
PARAMID#: TWT-W-HTR2
CREDOID#: EH-0001-01
```

EDETIACT ITB

```
Table name    : EDETIACT
File name     : A:EDETIACT.ITB
Read  Access : A...............
Write Access : A...............
Creation Date      :  08/02/85
Modification Date :  08/05/85
Number of Records :       27

     ----------
Field : #MARK        LOGIC
Read  Access : A...............
Write Access : A...............
Picture :  (default)

     ----------
Field : REPTNUMR     STR  6
Read  Access : A...............
Write Access : A...............
Picture : "dddd-r"

     ----------
Field : DMETHOD      STR  8
Read  Access : A...............
Write Access : A...............
Picture : "%8r"

     ----------
Field : OSTATUN      STR  8
Read  Access : A...............
Write Access : A...............
Picture : "%8r"

     ----------
Field : OSTATSYS     STR  8
Read  Access : A...............
Write Access : A...............
Picture : "%8r"

     ----------
Field : OSTATSUB     STR  8
Read  Access : A...............
Write Access : A...............
Picture : "%8r"

     ----------
Field : IACTION      STR  100
Read  Access : A...............
Write Access : A...............
Picture : "%100r"

     ----------
```

```
Record Number: 1

REPTNUMR:  -53-a
DMETHOD:
OSTATUN:
OSTATSYS:
OSTATSUB:
IACTION:
```

FAILURED.ITB

```
Table name    : FAILURED
File name     : A:FAILURED.ITB
Read  Access : A...............
Write Access : A...............
Creation Date      :  08/02/85
Modification Date :  08/05/85
Number of Records :        27

     ----------
Field : #MARK         LOGIC
Read  Access : A...............
Write Access : A...............
Picture :  (default)

     ----------
Field : REPTNUMR     STR  6
Read  Access : A...............
Write Access : A...............
Picture : "dddd-r"

     ----------
Field : FTYPE        STR  8
Read  Access : A...............
Write Access : A...............
Picture : "%8r"

     ----------
Field : FMODE        STR  8
Read  Access : A...............
Write Access : A...............
Picture : "%8r"

     ----------
Field : FCAUSE       STR  8
Read  Access : A...............
Write Access : A...............
Picture : "%8r"

     ----------
Field : PRIMARY      LOGIC
Read  Access : A...............
Write Access : A...............
Picture :  (default)

     ----------
```

```
Record Number: 1

REPTNUMR:  -53-a
FTYPE:
FMODE:
FCAUSE:
PRIMARY:  FALSE
```

FAILUREF.ITB

```
Table name    : FAILUREF
File name     : A:FAILUREF.ITB
Read  Access : A...............
Write Access : A...............
Creation Date      :  08/02/85
Modification Date :  08/05/85
Number of Records :        27

     ----------
Field : #MARK         LOGIC
Read  Access : A...............
Write Access : A...............
Picture :  (default)

     ----------
Field : REPTNUMR     STR  6
Read  Access : A...............
Write Access : A...............
Picture : "dddd-r"

     ----------

Field : FEFFSYS      STR  25
Read  Access : A...............
Write Access : A...............
Picture : "%25r"

     ----------
Field : HRLSTSYS     NUM
Read  Access : A...............
Write Access : A...............
Picture : "ddd"

     ----------
Field : FEFFUNIT     STR  25
Read  Access : A...............
Write Access : A...............
Picture : "%25r"

     ----------
Field : HRLSTUN      NUM
Read  Access : A...............
Write Access : A...............
Picture : "ddd"

     ----------
Field : OTHITAFF     STR  30
Read  Access : A...............
Write Access : A...............
Picture : "%30r"

     ----------
Field : CRITPRTS     STR  54
Read  Access : A...............
Write Access : A...............
Picture : "%54r"

     ----------
```

```
Record Number: 1

REPTNUMR:  -53-a
FEFFSYS:
HRLSTSYS:  0
FEFFUNIT:
HRLSTUN:  0
OTHITAFF:
CRITPRTS:
```

CORRACT ITB

```
Table name    : CORRACT
File name     : A:CORRACT.ITB
Read  Access : A.............
Write Access : A.............
Creation Date      :  08/02/85
Modification Date :  08/05/85
Number of Records :        27

     ----------
Field : #MARK        LOGIC
Read  Access : A.............
Write Access : A.............
Picture :  (default)

     ----------
Field : REPTNUMR     STR  6
Read  Access : A.............
Write Access : A.............
Picture : "dddd-r"

     ----------
Field : MNTACTN      STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : ADMACTN      STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : INTERIM      STR  200
Read  Access : A.............
Write Access : A.............
Picture : "%200r"

     ----------
Field : FINAL        STR  200
Read  Access : A.............
Write Access : A.............
Picture : "%200r"

     ----------
```

```
Record Number: 1

REPTNUMR:  -53-a
MNTACTN:
ADMACTN:
INTERIM:


FINAL:
```

MAINTDAT ITB

```
Table name    : MAINTDAT
File name     : A:MAINTDAT.ITB
Read  Access : A.............
Write Access : A.............
Creation Date      :  08/02/85
Modification Date :  08/05/85
Number of Records :        27

     ----------
Field : #MARK        LOGIC
Read  Access : A.............
Write Access : A.............
Picture :  (default)

     ----------
Field : REPTNUMR     STR  6
Read  Access : A.............
Write Access : A.............
Picture : "dddd-r"

     ----------
Field : RTIMETOT     NUM
Read  Access : A.............
Write Access : A.............
Picture : "dd/dd"

     ----------
Field : RTIMEADM     NUM
Read  Access : A.............
Write Access : A.............
Picture : "dd/dd"

     ----------
Field : RTIMELOG     NUM
Read  Access : A.............
Write Access : A.............
Picture : "dd/dd"

     ----------
Field : RTIMEIRP     NUM
Read  Access : A.............
Write Access : A.............
Picture : "dd/dd"

     ----------
Field : RTIMEDRP     NUM
Read  Access : A.............
Write Access : A.............
Picture : "dd/dd"

     ----------
Field : RTIMERET     NUM
Read  Access : A.............
Write Access : A.............
Picture : "dd/dd"

     ----------
```

```
Field : RTIMERES     NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd/dd"

     ----------
Field : TSLMAINT     STR  15
Read  Access : A.................
Write Access : A.................
Picture : "%15r"

     ----------
Field : TSLTEST      STR  15
Read  Access : A.................
Write Access : A.................
Picture : "%15r"

     ----------
```

```
Record Number: 1

REPTNUMR:  -53-a
RTIMETOT:    / 0
RTIMEADM:    / 0
RTIMELOG:    / 0
RTIMEIRP:    / 0
RTIMEDRP:    / 0
RTIMERET:    / 0
RTIMERES:    / 0
TSLMAINT:
TSLTEST:
```

EREMARKS ITB

```
Table name    : EREMARKS
File name     : A:EREMARKS.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  08/02/85
Modification Date :  08/05/85
Number of Records :        27

     ----------
Field : #MARK         LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : REPTNUMR     STR  6
Read  Access : A.................
Write Access : A.................
Picture : "dddd-r"

     ----------
Field : REMARKS      STR  400
Read  Access : A.................
Write Access : A.................
Picture : "%400r"

     ----------
```

```
Record Number: 1

REPTNUMR:  -53-a
REMARKS:
```

RON ITB

```
Table name    : RON
File name     : A:RON.ITB
Read  Access  : A.............
Write Access  : A.............
Creation Date      :  08/13/85
Modification Date  :  08/28/85
Number of Records  :        1

     ----------
Field : #MARK         LOGIC
Read  Access : A.............
Write Access : A.............
Picture :  (default)

     ----------
Field : SBSYSTEM      STR  20
Read  Access : A.............
Write Access : A.............
Picture : "%20r"

     ----------
Field : REPDATE      -NUM
Read  Access : A.............
Write Access : A.............
Picture : "dd/dd/dd"

     ----------
Field : PARAMID#      STR  10
Read  Access : A.............
Write Access : A.............
Picture : "aaa-a-ccccc"

     ----------
Field : PARAMTRS      STR  149
Read  Access : A.............
Write Access : A.............
Picture : "%149r"

     ----------
Field : ETIME         NUM
Read  Access : A.............
Write Access : A.............
Picture : "dd:dd:dd"

     ----------
Field : EDATE         STR  10
Read  Access : A.............
Write Access : A.............
Picture : "%10r"

     ----------

Field : CONFIG        STR  149
Read  Access : A.............
Write Access : A.............
Picture : "%149r"

     ----------
```

```
Field : DMETHOD       STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------
Field : OCCURTIT      STR  55
Read  Access : A.............
Write Access : A.............
Picture : "%55r"

     ----------
Field : DESCRIBE      STR  250
Read  Access : A.............
Write Access : A.............
Picture : "%250r"

     ----------
Field : IACTION       STR  100
Read  Access : A.............
Write Access : A.............
Picture : "%100r"

     ----------
Field : ORIGNATR      STR  20
Read  Access : A.............
Write Access : A.............
Picture : "%20r"

     ----------
Field : CMPONENT      STR  50
Read  Access : A.............
Write Access : A.............
Picture : "%50r"

     ----------
Field : SPECPROB      STR  149
Read  Access : A.............
Write Access : A.............
Picture : "%149r"

     ----------
Field : FEFFSYS       STR  25
Read  Access : A.............
Write Access : A.............
Picture : "%25r"

     ----------
Field : FEFFUNIT      STR  25
Read  Access : A.............
Write Access : A.............
Picture : "%25r"

     ----------
```

```
Field : HRLSTUN      NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddd"

     ----------
Field : OTHITAFF     STR  30
Read  Access : A.................
Write Access : A.................
Picture : "%30r"

     ----------
Field : FINAL        STR  200
Read  Access : A.................
Write Access : A.................
Picture : "%200r"

     ----------
Field : REMARKS      STR  400
Read  Access : A.................
Write Access : A.................
Picture : "%400r"

     ----------
Field : FAILCOMP     STR  69
Read  Access : A.................
Write Access : A.................
Picture : "%69r"

     ----------
Field : SERNUMB      STR  50
Read  Access : A.................
Write Access : A.................
Picture : "%50r"

     ----------
Field : MODLNMBR     STR  50
Read  Access : A.................
Write Access : A.................
Picture : "%50r"

     ----------
Field : CRITPRTS     STR  54
Read  Access : A.................
Write Access : A.................
Picture : "%54r"

     ----------
Field : CORRMNTC     STR  309
Read  Access : A.................
Write Access : A.................
Picture : "%309r"

     ----------
```

```
Field : RTIMETOT     NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd/dd"

     ----------

Field : RTIMEADM     NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd/dd"

     ----------
Field : RTIMELOG     NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd/dd"

     ----------
Field : RTIMEIRP     NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd/dd"

     ----------
Field : RTIMEDRP     NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd/dd"

     ----------
Field : RTIMERET     NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd/dd"

     ----------
Field : RTIMERES     NUM
Read  Access : A.................
Write Access : A.................
Picture : "dd/dd"

     ----------
Field : TSLMAINT     STR  15
Read  Access : A.................
Write Access : A.................
Picture : "%15r"

     ----------
Field : TSLTEST      STR  15
Read  Access : A.................
Write Access : A.................
Picture : "%15r"

     ----------
```

```
Field : VERMTHOD     STR  229
Read  Access : A.............
Write Access : A.............
Picture : "%229r"

     ----------
Field : COMPLETD     STR  8
Read  Access : A.............
Write Access : A.............
Picture : "%8r"

     ----------

Field : COMPLTBY     STR  69
Read  Access : A.............
Write Access : A.............
Picture : "%69r"

     ----------
Field : MNTCEQIP     STR  149
Read  Access : A.............
Write Access : A.............
Picture : "%149r"

     ----------
Field : REPTNUMR     STR  6
Read  Access : A.............
Write Access : A.............
Picture : "dddd-r"

     ----------
Field : HRLSTSYS     NUM
Read  Access : A.............
Write Access : A.............
Picture : "ddd"

     ----------
Field : CAUSE        STR  15
Read  Access : A.............
Write Access : A.............
Picture : "%15r"

     ----------
Field : PROBLEM      STR  50
Read  Access : A.............
Write Access : A.............
Picture : "%50r"

     ----------
Field : WIERDCIR     STR  69
Read  Access : A.............
Write Access : A.............
Picture : "%69r"

     ----------
```

```
Field : FTYPE        STR  50
Read  Access : A.............
Write Access : A.............
Picture : "%50r"

     ----------
Field : CREDOID#     STR  10
Read  Access : A.............
Write Access : A.............
Picture : "rr-dddd-dd"

     ----------
```

```
Record Number: 1

SBSYSTEM:
REPDATE:     /  / 0
PARAMID#:     -  -
PARAMTRS:


ETIME:       :  : 0
EDATE:       /  /
CONFIG:


DMETHOD:
OCCURTIT:
DESCRIBE:



IACTION:

ORIGNATR:
COMPONENT:
SPECPROB:


FEFFSYS:
FEFFUNIT:
HRLSTUN:     0
OTHITAFF:
FINAL:


REMARKS:
```

```
FAILCOMP:

SERNUMB:
MODLNMBR:
CRITFRTS:
CORRMNTC:



RTIMETOT:    / 0
RTIMEADM:    / 0
RTIMELOG:    / 0
RTIMEIRP:    / 0
RTIMEDRP:    / 0
RTIMERET:    / 0
RTIMERES:    / 0
TSLMAINT:
TSLTEST:
VERMTHOD:



COMPLETD:    /  /
COMPLTBY:
MNTCEQIP:


REPTNUMR: 1234-F
HRLSTSYS:   0
CAUSE:
PROBLEM:
WIERDCIR:

FTYPE:
CREDOID#:    -    -
```

MAINT1 ITB

```
Table name    : MAINT1
File name     : A:MAINT1.ITB
Read  Access : A...............
Write Access : A...............
Creation Date      :  08/20/85
Modification Date :  08/20/85
Number of Records :        0

     ----------
Field : #MARK         LOGIC
Read  Access : A...............
Write Access : A...............
Picture :  (default)

     ----------
Field : EDATE         STR  10
Read  Access : A...............
Write Access : A...............
Picture : "%10r"

     ----------
Field : SBSYSTEM    STR  50
Read  Access : A...............
Write Access : A...............
Picture : "%50r"

     ----------
Field : CONFIG        STR  149
Read  Access : A...............
Write Access : A...............
Picture : "%149r"

     ----------
Field : PARAMTRS     STR  149
Read  Access : A...............
Write Access : A...............
Picture : "%149r"

     ----------
Field : DESCRIBE     STR  50
Read  Access : A...............
Write Access : A...............
Picture : "%50r"

     ----------
Field : ORIGNATR     STR  50
Read  Access : A...............
Write Access : A...............
Picture : "%50r"

     ----------
Field : OCCURTIT     STR  55
Read  Access : A...............
Write Access : A...............
Picture : "%55r"

     ----------
```

```
Field : ETIME         NUM
Read  Access : A...............
Write Access : A...............
Picture : "dd:dd.dd"

     ----------
Field : REPTNUMR     STR  6
Read  Access : A...............
Write Access : A...............
Picture : "dddd-r"

     ----------
```

```
Record Number: 1

EDATE:     06/28/84
SBSYSTEM: twt/tm
CONFIG:    operational


PARAMTRS: normal (high levels ~2000 Ci had been processed in twt)


DESCRIBE: chamber reading high; won't clean up by evacuating
ORIGNATR: Damiano
OCCURTIT:
ETIME:        :  : 0
REPTNUMR:  -53-a
```

Appendix C: Table Definitions and Examples

4. Operating Data

REPORTID ITB

```
Table name    : REPORTID
File name     : A:REPORTID.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  08/20/85
Modification Date :  08/20/85
Number of Records :         1

     ----------
Field : #MARK         LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TSTAOP#       STR  4
Read  Access : A.................
Write Access : A.................
Picture : "dddd"

     ----------
Field : RPERSTRT      STR  8
Read  Access : A.................
Write Access : A.................
Picture : "dd/dd/dd"

     ----------
Field : RPEREND       STR  8
Read  Access : A.................
Write Access : A.................
Picture : "dd/dd/dd"

     ----------
Field : COMPLBY       STR  20
Read  Access : A.................
Write Access : A.................
Picture : "%20r"

     ----------
```

```
Record Number: 1

TSTAOP#:  1
RPERSTRT: 01/01/01
RPEREND:  03/31/01
COMPLBY:  kmj
```

OPTIMES ITB

```
Table name    : OPTIMES
File name     : A:OPTIMES.ITB
Read  Access : A.................
Write Access : A.................
Creation Date      :  08/19/85
Modification Date :  08/20/85
Number of Records :         1

     ----------
Field : #MARK         LOGIC
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : TSTAOP#       STR  4
Read  Access : A.................
Write Access : A.................
Picture : "dddd"

     ----------
Field : NORMALOP      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : LIMITEDO      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : SHUTDOWN      NUM
Read  Access : A.................
Write Access : A.................
Picture :  (default)

     ----------
Field : NUMEVENT      NUM
Read  Access : A.................
Write Access : A.................
Picture : "ddddd"

     ----------
```

```
Record Number: 1

TSTAOP#:  1
NORMALOP:
LIMITEDO:
SHUTDOWN:
NUMEVENT:
```

AVAILDAT.ITB

```
Table name    : AVAILDAT
File name     : A:AVAILDAT.ITB
Read  Access  : A...............
Write Access  : A...............
Creation Date      :  08/19/85
Modification Date  :  08/20/85
Number of Records  :         1

     ----------
Field : #MARK         LOGIC
Read  Access : A...............
Write Access : A...............
Picture :  (default)

     ----------
Field : TSTAOP#       STR  4
Read  Access : A...............
Write Access : A...............
Picture : "dddd"

     ----------
Field : DESOUT        STR  20
Read  Access : A...............
Write Access : A...............
Picture : "%20r"

     ----------
Field : AUTHOUT       STR  20
Read  Access : A...............
Write Access : A...............
Picture : "%20r"

     ----------
Field : TOTOUT        STR  20
Read  Access : A...............
Write Access : A...............
Picture : "%20r"

     ----------
Field : SCHOUT#       NUM
Read  Access : A...............
Write Access : A...............
Picture : "dddddd"

     ----------
Field : SCHOUTHR      NUM
Read  Access : A...............
Write Access : A...............
Picture :  (default)

     ----------
Field : UNSOUT#       NUM
Read  Access : A...............
Write Access : A...............
Picture : "dddddd"

     ----------
Field : UNSOUTHR      NUM
Read  Access : A...............
Write Access : A...............
Picture :  (default)

     ----------
Field : COMMENTS      STR  200
Read  Access : A...............
Write Access : A...............
Picture : "%200r"

     ----------
Field : TRCYC#        NUM
Read  Access : A...............
Write Access : A...............
Picture : "dddddd"

     ----------
Field : TRCYCHR       NUM
Read  Access : A...............
Write Access : A...............
Picture :  (default)

     ----------
```

```
Record Number: 1

TSTAOP#:  1
DESOUT:
AUTHOUT:
TOTOUT:
SCHOUT#:
SCHOUTHR:
UNSOUT#:
UNSOUTHR:
COMMENTS:


TRCYC#:
TRCYCHR:
```

Appendix D: Original and Current TSTA Failure and Corrective Maintenance Report Forms

TSTA FAILURE AND CORRECTIVE MAINTENANCE REPORT FORM

original form

Subsystem_____ Originator_____ Date_____

TSTA Parameter No._____

Subsystem Parameters at Time of Failure _____

Subsystem Configuration at Time of Failure _____

Describe Problem, Symptoms, and Cause (if known) _____

Effect on TSTA Operations _____

**********Bottom section to be filled out when corrective maintenance is performed**********

Corrective Action Taken : Corrected by TSTA Operational Personnel ____
Corrected by TSTA Repair / Design Personnel ____
Other (Specify) _____

Failed Component _____Serial Number _____ Model Number _____

Problem with Component: Electrical ____ Mechanical ____ Software ____ Other (Specify) _____

Specific Problem Description _____

Cause : Software ____ Personnel ____ Material ____ Design ____ Procedure ____ Other (Specify) _____

Describe Corrective Maintenance Taken to Correct Failure _____

Special Maintenance Equipment Required _____

Time Required for Component Repair / Replacement _____

Unusual Circumstances Causing Long or Short Repair / Replacement Time :
Accessibility ____ Size and Weight of Component ____ Connections ____ Contamination ____ (Level ____) Other _____

Method Used for Verification of System Operational Status _____

Corrective Action Completed On _____ By _____

Report Number (filled in by QA) _____

Instructions and Explanations

1) Subsystem - The person that initiates the report specifies the major subsystem involved in the failure.

2) Originator - The person that initiates the report.

3) Date - The date that the failure occurred.

4) TSTA Parameter - The Parameter reading that was being examined when the failure was noticed.

5) Parameters - List any displays or readings that might be helpful in determining what was happening at the time of the failure.

6) Configuration - List the operating status of the subsystem when the failure occurred.

7) Description - Give a short description of exactly what the problem is. - any symptoms noticed before, during, or after the failure, and the cause of the failure if you know.

8) Effect on TSTA - Give a short description of what effect the failure will have on the entire system. (Will the failure cause TSTA to shut down or not).

The next part of the form is to be filled out at the time corrective action is taken to correct the failure. If the person that filed the report is going to perform the maintenance then they will be responsible for filling out the entire report form. If the equipment is removed by TSTA personnel and sent out for repair, then the personnel that pulled the equipment are responsible for filling out everything except the section describing the corrective action taken to correct the failure. The subsystem designers will be responsible for finding out what action was taken to fix the equipment and filling out the description of corrective maintenance.

9) Action Taken - Check the appropriate line or describe who took the corrective action.

10) Component - Indicate the specific component that failed.

11) Serial Number - List the serial number of the failed component if applicable.

12) Model Number - List the model number of the failed component if applicable.

13) Problem - This section is to be filled out by the initiator of the report. Use your best judgement in determining what the basic problem was. If you use the "OTHER" category, please be as specific as possible.

14) Specific Problem - Specify exactly what the problem was in this section. For example, if a thermocouple failed due to an electrical problem then you would check the electrical problem line in section 13 but you would also list in this section that it was the thermocouple that failed.

15) Cause - Check the area that best describes what the cause of the problem really was. Again if you use the "OTHER" line be specific.

16) Description - Give a brief description of what was done to the failed component in order to bring it back to its pre-failure state. If the equipment needed to be replaced then give the reasons.

17) Special Equip. - List any special tools or equipment needed to repair or replace the failed component.

18) Time Required - Give an estimation of the time it took to fix the failed component.

19) Circumstances - Check the appropriate line if any of the listed items caused any problems while you were trying to correct the failure. If contamination was a factor then list the approximate level of contamination you were dealing with.

20) Verification - List the method used to make sure that the component would operate properly before involving the entire system. List any test plans, calibration procedures, etc., that were used in the verification.

21) Completed - Give the date that the corrective action was completed.

[illegible] that corrective

current form

TSTA FAILURE AND CORRECTIVE MAINTENANCE REPORT FORM 1

Subsystem _____ Originator _____ Report Date ___/___/___

TSTA Parameter No. or Name _____ Event Date ___/___/___ Event Time ___:___:___

Subsystem Parameters at Time of Failure _____

Subsystem Configuration at Time of Failure _____

Method of Detection _____ Occurrence Title _____

Event Narrative _____

_____

_____

_____

Initial (Immediate) Action _____

****

COMPONENT FAILURE DATA (Originator - complete the remainder of this form as fully as possible)

Component Description _____

Cause: Software ___ Personnel ___ Material ___ Design ___ Procedure ___ Other (Specify) _____

Failure Cause Narrative _____

_____

Failure Effects: Subsystem: _____ Hours Lost _____

Unit: _____ Hours Lost _____

Other Items Affected: _____

Proposed Long-Term Corrective Action _____

_____

_____

Remarks _____

_____

_____

_____

TSTA Report Number (filled in by QA) _____

INSTRUCTIONS AND EXPLANATIONS

1) Subsystem - The person who initiates the report specifies the major subsystem involved in the failure.

2) Originator - The person who initiates the report.

3) Report Date - The date that the report is completed.

4) TSTA Parameter - The parameter reading or the name of the component that was being examined when the failure was noticed.

5) Event Date & Time - The date and time that the failure occurred.

6) Occurrence Title - A very short name for the event, for example, 'false high alarm'.

7) Parameters - List any displays or readings that might be helpful in determining what was happening at the time of the failure.

8) Configuration - List the operating status of the subsystem when the failure occurred.

9) Event Narrative - Give a short description of exactly what happened, any symptoms noticed before, during, or after the failure, and the cause of the failure if you know.

10) Initial Action - Give a short description of the immediate action taken to take care of the problem.

****

The remainder of the form is to be filled out if the information requested is known at the time of the failure.

11) Component - Indicate the specific component that failed.

12) Cause - Check the area that best describes what the cause of the problem really was.

13) Failure Cause Nar. - Specify exactly what the problem was.

14) Failure Effects - Subsystem - Specify the effects of the failure on the subsystem and the time lost because of the failure.

15) Failure Effects - Unit, time - Specify the effects of the failure on TSTA and the process loop down time because of the failure.

16) Failure Effects - Other Items - Specify other items affected and the time lost because of the failure.

17) Corrective Action - Specific suggestions to avoid recurrence of the failure, including suggested procedural changes or changes in equipment.

19) Remarks - Self explanatory.

TSTA FAILURE AND CORRECTIVE MAINTENANCE REPORT FORM II

TSTA Report Number (filled in by QA) _____ Corrective Action Taken: Corrected by TSTA Operational Personnel ___
Corrected by TSTA Repair/Design Personnel ___
Other (Specify) _____

Failed Component _____ Serial Number _____ Model Number _____

Critical Part(s) _____

Problem with Component: Electrical ___ Mechanical ___ Software ___ Other (Specify) _____

Describe Corrective Maintenance Taken to Correct Failure _____

_____

_____

_____

_____

Special Maintenance Equipment Required _____

_____

Time Required for Component Repair/Replacement (hours/manhours) (i) Total ____/____ (ii) Administrative ____/____

(iii) Logistics ____/____ (iv) Indirect Repair ____/____ (v) Direct Repair ____/____ (vi) Retest ____/____

(vii) Restart ____/____

Time Since Last (i) Maintenance _____ (ii) Testing _____

Unusual Circumstances Causing Long or Short Repair/Replacement Time:

Accessibility ___ Size and Weight of Component ___ Connections ___ Contamination ___ (Level _____)

Other (Specify) _____

Method Used for Verification of System Operational Status _____

_____

_____

Corrective Action Completed On ____/____/____ By _____

INSTRUCTIONS AND EXPLANATIONS

This part of the form is to be filled out at the time corrective action is taken to correct the failure. If the person that filed the report is going to perform the maintenance then they will be responsible for filling out the entire report form. If the equipment is removed by TSTA personnel and sent out for repair, then the personnel that pulled the equipment are responsible for filling out everything except the section describing the corrective action taken to correct the failure. The subsystem designers will be responsible for finding out what action was taken to fix the equipment and filling out the description of corrective maintenance.

1) Action Taken - Check the appropriate line or describe who took the corrective action.

2) Component - Indicate the specific component that failed.

3) Critical Part(s) - Specify which piece(s) of the component failed.

4) Serial Number - List the serial number of the failed component if applicable.

5) Model Number - List the model number of the failed component if applicable.

6) Problem - Fill in what the basic problem was. If you use the "other" category, be as specific as possible.

7) Description - Give a brief description of what was done to the failed component in order to bring it back to its pre-failure state. If the equipment needed to be replaced then give the reasons.

8) Special Equipment - List any special tools or equipment needed to repair or replace the failed component.

9) Time Required - Give an estimation of the time it took to fix the failed component. Identify specific category of time expenditure if possible.

10) Circumstances - Check the appropriate line if any of the listed items caused any problems while you were trying to correct the failure. If contamination was a factor then list the approximate level of contamination you were dealing with.

11) Verification - List the method used to make sure that the component would operate properly before involving the entire system. List any test plans, calibration procedures, etc., that were used in the verification.

12) Completed - Give the date that the correction action was completed.

13) By - Signature of the person who verified that corrective action was completed.

Appendix E: Programs

1. Programs for Menu Structure

CREDO IPF

```
/* File Name:  CREDO.IPF */

/* This is the main controller program for the CREDO data structure */
/* on the IBM PC for use with the Tritium Waste Treatment System at */
/* the Tritium Systems Test Assembly */

/* Put up the first menu and ask the user which type of data they */
/* want to work with or if they want to go to the help screens */

let e.deci = 0
let e.lnum = 1
let e.lstr = 80
opnuma = 0
while opnuma < 6 do
   clear
   perform "b:menua.ipf"
   putform menua
   i = 0
   while i < 10 do
      at 16,64 input opnuma
      test opnuma
         case 0: perform "b:helpscrn.ipf"; i = 99; break
         case 1: perform "b:cmenub1.ipf"; i = 99; break
         case 2: perform "b:cmenub2.ipf"; clear; putform cmenub2; wait; i = 99;
break
         case 3: perform "b:cmenub2.ipf"; clear; putform cmenub2; wait; i = 99;
break
         case 4: perform "b:cmenub2.ipf"; clear; putform cmenub2; wait; i = 99;
break
         case 5: let e.deci=5; let e.lnum=14; let e.lstr=15; stop
         otherwise: at 19,6 output "This is not a valid option number, please re
enter the option number."; break
      endtest
   endwhile
   opnuma = 0
endwhile
```

MENUA IPF

this procedure called by credo.ipf

```
FORM MENUA
        AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 9 PUT "THE CREDO DATA STRUCTURE FOR THE TRITIUM WASTE TREATMENT SY
STEM"
        AT 4, 9 PUT "-----------------------------------------------------------
----"
        AT 6, 6 PUT "The CREDO data structure for the Tritium Waste Treatment Sy
stem of the"
        AT 7, 6 PUT "Tritium Systems Test Assembly contains four types of data:"

        AT 9, 11 PUT "1. Base Engineering Data for each component"
        AT 10, 11 PUT "2. Supplemental Engineering Data for each component"
        AT 11, 11 PUT "3. Event Data for each reportable event"
        AT 12, 11 PUT "4. Operating Data for each calendar quarter of operation"

        AT 15, 6 PUT "Enter the option number for the type of data you want to w
ork with or"
        AT 16, 6 PUT "\"0\" for further information, or \"5\" to quit this progr
am:"
ENDFORM
```

```
    THE CREDO DATA STRUCTURE FOR THE TRITIUM WASTE TREATMENT SYSTEM
    --------------------------------------------------------------

The CREDO data structure for the Tritium Waste Treatment System of the
Tritium Systems Test Assembly contains four types of data:

     1. Base Engineering Data for each component
     2. Supplemental Engineering Data for each component
     3. Event Data for each reportable event
     4. Operating Data for each calendar quarter of operation


Enter the option number for the type of data you want to work with or
"0" for further information, or "5" to quit this program: _
```

this procedure called by credo.ipf

HELPSCRN IPF

```
/* File name:  helpscrn.ipf */

/* This program controls the help screens for the CREDO menu */
/* structure.  The program is implemented by a dynamic redefine */
/* of the [ctrl] F10 function key which takes place in the main */
/* program for the CREDO menu structure, credo.ipf */

/* save the values of the environmental variables so they can */
/* be returned to the same values when the user exits from the */
/* help screens */

decval = 0
numval = 0
strval = 0
decval = e.deci
numval = e.lnum
strval = e.lstr

/* clear the screen and ask the user which help screen they want */
/* to see */

let e.deci = 0
let e.lnum = 1
let e.lstr = 80
opnum = 0
while opnum < 6 do
   clear
   perform "helpa.ipf"
   putform helpa
   i = 0
   while i < 10 do
      at 17,49 input opnum
      test opnum
         case 0: let e.deci=decval; let e.lnum=numval; let e.lstr=strval; return
         case 1: perform "chelpb1.ipf"; i = 99; break
         case 2: perform "chelpb2.ipf"; clear; putform chelpb2; wait; i = 99; br
eak
         case 3: perform "chelpb2.ipf"; clear; putform chelpb2; wait; i = 99; br
eak
         case 4: perform "chelpb2.ipf"; clear; putform chelpb2; wait; i = 99; br
eak
         otherwise: at 20,6 output "This is not a valid option number, please re
enter the option number."; break
      endtest
   if opnum = 0 then let e.deci=decval; let e.lnum=numval; let e.lstr = strval;
return; endif
   endwhile
   opnum = 0
endwhile
```

this procedure called by helpscrn.ipf

HELPA IPF

```
FORM HELPA
        AT 1, 1 TO 24, 80 PUT "FWBM"
        AT 3, 34 PUT "HELP SCREENS"
        AT 4, 34 PUT "------------"
        AT 7, 6 PUT "The CREDO data structure for the Tritium Waste Treatment S
stem of the"
        AT 8, 6 PUT "Tritium Systems Test Assembly contains four types of data:

        AT 10, 11 PUT "1. Base Engineering Data for each component"
        AT 11, 11 PUT "2. Supplemental Engineering Data for each component"
        AT 12, 11 PUT "3. Event Data for each reportable event"
        AT 13, 11 PUT "4. Operating Data for each calendar quarter of operation

        AT 16, 6 PUT "Enter the option number for the type of data you want help
 with or \"0\""
        AT 17, 6 PUT "to continue processing where you left off:"
ENDFORM
```

HELP SCREENS

The CREDO data structure for the Tritium Waste Treatment System of the Tritium Systems Test Assembly contains four types of data:

1. Base Engineering Data for each component
2. Supplemental Engineering Data for each component
3. Event Data for each reportable event
4. Operating Data for each calendar quarter of operation

Enter the option number for the type of data you want help with or "0" to continue processing where you left off: _

this procedure called by helpscrn.ipf

CHELPB1 IPF

```
/* file name:  chelpb1.ipf */

/* This program controls the help screens for the base */
/* engineering data */

/* Put up the screen and ask the user what they want more */
/* information on */

let e.deci = 0
let e.lnum = 1
let e.lstr = 80
opnumb = 0
while opnumb < 9 do
   clear
   perform "b:helpb1.ipf"
   putform helpb1
   i = 0
   while i < 10 do
      at 23,20 input opnumb
      test opnumb
         case 0: opnum = 0; return
         case 1: perform "b:helpbc1.ipf"; clear; putform helpbc1; wait; i = 99;
break
         case 2: perform "b:helpbc2.ipf"; clear; putform helpbc2; wait; i = 99;
break
         case 3: perform "b:helpbc2.ipf"; clear; putform helpbc2; wait; i = 99;
break
         case 4: perform "b:helpbc2.ipf"; clear; putform helpbc2; wait; i = 99;
break
         case 5: perform "b:helpbc2.ipf"; clear; putform helpbc2; wait; i = 99;
break
         case 6: perform "b:helpbc2.ipf"; clear; putform helpbc2; wait; i = 99;
break
         case 7: return
         otherwise: at 24,6 output "This is not a valid option number, please re
enter the option number."; break
      endtest
   endwhile
   opnumb = 0
endwhile
```

this procedure called by chelpb1.ipf

HELPB1 IPF

```
FORM HELPB1
        AT 1, 1 TO 24, 80 PUT "FWBM"
        AT 3, 21 PUT "HELP SCREEN FOR BASE ENGINEERING DATA"
        AT 4, 21 PUT "-----------------------------------"
        AT 6, 6 PUT "Do you want information on:"
        AT 8, 9 PUT "1. Browsing/changing/adding to existing data records"
        AT 10, 9 PUT "2. Creating new data records"
        AT 12, 9 PUT "3. Deleting existing data records"
        AT 14, 9 PUT "4. Printing a CREDO form"
        AT 16, 9 PUT "5. Table structure"
        AT 18, 9 PUT "6. Listing out data for more than one record"
        AT 21, 6 PUT "Enter the option number for the type of processing you wan
t help with or"
        AT 22, 6 PUT "\"7\" to return to the previous screen or \"0\" to continu
e processing where"
        AT 23, 6 PUT "you left off:"
ENDFORM
```

HELP SCREEN FOR BASE ENGINEERING DATA

Do you want information on:

1. Browsing/changing/adding to existing data records
2. Creating new data records
3. Deleting existing data records
4. Printing a CREDO form
5. Table structure
6. Listing out data for more than one record

Enter the option number for the type of processing you want help with or "7" to return to the previous screen or "0" to continue processing where you left off: _

this procedure called by chelpb1.ipf

HELPBC1 IPF

```
FORM HELPBC1
        AT 1, 1 TO 24, 80 PUT "FWBM"
        AT 3, 9 PUT "HELP SCREEN FOR BROWSING/CHANGING/ADDING TO EXISTING DATA R
ECORDS"
        AT 4, 9 PUT "-----------------------------------------------------------
------"
        AT 6, 6 PUT "When you choose to work with all 7 tables at once under thi
s option, you "
        AT 7, 6 PUT "will be sent to the SUPPFORM table first.  Then, you will b
e allowed to"
        AT 8, 6 PUT "browse the SUPPFORM table until you get to the one record y
ou want to"
        AT 9, 6 PUT "work with."
        AT 11, 6 PUT "When you finish working with that record in the SUPPFORM t
able, press"
        AT 12, 6 PUT "\"esc\" and you will be sent to the record in the COMPSPEC
 table which has"
        AT 13, 6 PUT "the same CREDO ID# as the one you just worked with in the
SUPPFORM table."
        AT 15, 6 PUT "You are now \"locked in\" to routing through this one reco
rd in the remain-"
        AT 16, 6 PUT "ing 6 tables. If you do not want to make any changes or ad
ditions in"
        AT 17, 6 PUT "these remaining tables, continue pressing \"esc\" through
the last table"
        AT 18, 6 PUT "and you will be sent back to the \"Browse/Change/Add to\"
option menu."
        AT 21, 6 PUT "No other help screens are currently available for this opt
ion, so"
        AT 22, 6 PUT "PRESS RETURN TO GO BACK TO PREVIOUS SCREEN"
ENDFORM
```

HELP SCREEN FOR BROWSING/CHANGING/ADDING TO EXISTING DATA RECORDS

When you choose to work with all 7 tables at once under this option, you will be sent to the SUPPFORM table first. Then, you will be allowed to browse the SUPPFORM table until you get to the one record you want to work with.

When you finish working with that record in the SUPPFORM table, press "esc" and you will be sent to the record in the COMPSPEC table which has the same CREDO ID# as the one you just worked with in the SUPPFORM table.

You are now "locked in" to routing through this one record in the remaining 6 tables. If you do not want to make any changes or additions in these remaining tables, continue pressing "esc" through the last table and you will be sent back to the "Browse/Change/Add to" option menu.

No other help screens are currently available for this option, so
PRESS RETURN TO GO BACK TO PREVIOUS SCREEN

this procedure called by chelpb1.ipf

HELPBC2 IPF

```
FORM HELPBC2
        AT 1, 1 TO 24, 80 PUT "FWBM"
        AT 3, 3 PUT "This option is not available.  A structure has been partia
ly developed for"
        AT 4, 3 PUT "the \"Browsing/changing/adding to\" option only.  A simila
 help structure "
        AT 5, 3 PUT "can be developed for the remaining options using the \"Brow
sing/changing/"
        AT 6, 3 PUT "adding to\" structure as a template.  Refer to the appendi
es of UWFDM-653"
        AT 7, 3 PUT "for a program listing of the help structure for the \"Brow
ing/changing/adding"
        AT 8, 3 PUT "to\" option."
        AT 21, 3 PUT "PRESS RETURN TO GO BACK TO PREVIOUS SCREEN"
ENDFORM
```

This option is not available. A structure has been partially developed for the "Browsing/changing/adding to" option only. A similar help structure can be developed for the remaining options using the "Browsing/changing/adding to" structure as a template. Refer to the appendices of UWFDM-653 for a program listing of the help structure for the "Browsing/changing/adding to" option.

PRESS RETURN TO GO BACK TO PREVIOUS SCREEN

this procedure called by helpscrn.ipf

CHELPB2 IPF

```
FORM CHELPB2
        AT 1, 1 TO 24, 80 PUT "FWBM"
        AT 3, 3 PUT "This option is not available.  A structure has been partial
ly developed for"
        AT 4, 3 PUT "the Base Engineering Data only.  A similar help structure c
an be developed"
        AT 5, 3 PUT "for the remaining 3 types of data using the Base Engineerin
g Data structure"
        AT 6, 3 PUT "as a template.  Refer to the appendices of UWFDM-653 for a
program listing"
        AT 7, 3 PUT "of the help structure for the Base Engineering Data."
        AT 21, 3 PUT "PRESS RETURN TO GO BACK TO PREVIOUS SCREEN"
ENDFORM
```

```
This option is not available.  A structure has been partially developed for
the Base Engineering Data only.  A similar help structure can be developed
for the remaining 3 types of data using the Base Engineering Data structure
as a template.  Refer to the appendices of UWFDM-653 for a program listing
of the help structure for the Base Engineering Data.




PRESS RETURN TO GO BACK TO PREVIOUS SCREEN
```

this procedure called by credo.ipf

CMENUB1 IPF

```
/* file name:  cmenub1.ipf */

/* This is the controller program for the base engineering data */

/* Put up the menu and ask the user what they want to do with the */
/* base engineering data */

let e.deci = 0
let e.lnum = 1
let e.lstr = 80
opnumb = 0
while opnumb < 9 do
   clear
   perform "b:menub1.ipf"
   putform menub1
   i = 0
   while i < 10 do
      at 23,58 input opnumb
      test opnumb
         case 0: perform "b:helpscrn.ipf"; i = 99; break
         case 1: perform "b:cmenubc1.ipf"; i = 99; break
         case 2: perform "b:cmenubc2.ipf"; i = 99; break
         case 3: perform "b:cmenubc3.ipf"; i = 99; break
         case 4: perform "b:cbedform.ipf"; i = 99; break
         case 5: perform "b:menubc5.ipf"; clear; putform menubc5; wait; i = 99;
break
         case 6: perform "b:cmenubc6.ipf"; i = 99; break
         case 7: return
         case 8: let e.deci=5; let e.lnum=14; let e.lstr=15; stop
         otherwise: at 24,6 output "This is not a valid option number, please re
enter the option number."; break
      endtest
   endwhile
   opnumb = 0
endwhile
```

MENUB1 IPF

this procedure called by cmenub1.ipf

```
FORM MENUB1
        AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 29 PUT "BASE ENGINEERING DATA"
        AT 4, 29 PUT "----------------------"
        AT 6, 6 PUT "Do you want to:     1. Browse/change/add to existing data"

        AT 7, 29 PUT "records"
        AT 9, 26 PUT "2. Create new data records"
        AT 11, 26 PUT "3. Delete existing data records"
        AT 13, 26 PUT "4. Print a CREDO form"
        AT 15, 26 PUT "5. Look at table structure"
        AT 17, 26 PUT "6. List out data for more than one record"
        AT 19, 26 PUT "7. Return to previous menu"
        AT 21, 26 PUT "8. Quit this program"
        AT 23, 6 PUT "Enter option number or \"0\" for further information:"
ENDFORM
```

```
                    BASE ENGINEERING DATA
                    ---------------------

Do you want to:     1. Browse/change/add to existing data
                       records

                    2. Create new data records

                    3. Delete existing data records

                    4. Print a CREDO form

                    5. Look at table structure

                    6. List out data for more than one record

                    7. Return to previous menu

                    8. Quit this program

Enter option number or "0" for further information: _
```

this procedure called by cmenub1.ipf

CMENUBC1 IPF

```
/* file name:  cmenubc1.ipf */

/* This is the program to browse/change/add to existing records */
/* in the base engineering data */

/* Put up the menu and ask the user which table(s) they want to */
/* work with and whether they want to use the raw table structure */
/* or a form to work with the table(s) */

let e.deci = 0
let e.lnum = 2
let e.lstr = 80
opnumbca = 0
while opnumbca < 11 do
   let e.serr = true
   finish all
   let e.serr = false
   clear
   perform "b:menubc1a.ipf"
   putform menubc1a
   i = 0
   while i < 10 do
      at 14,58 input opnumbca
      test opnumbca
         case 0: perform "b:helpscrn.ipf"; putform menubc1a; break
         case 1: use "b:suppform.itb"; i = 99; break
         case 2: use "b:compspec.itb"; i = 99; break
         case 3: use "b:designs.itb"; i = 99; break
         case 4: use "b:opduty.itb"; i = 99; break
         case 5: use "b:maininsp.itb"; i = 99; break
         case 6: use "b:environ.itb"; i = 99; break
         case 7: use "b:remarks.itb"; i = 99; break
         case 8: use "b:suppform.itb"; use "b:compspec.itb"; use "b:designs.itb"
; use "b:opduty.itb"; use "b:maininsp.itb"; use "b:environ.itb"; use "b:remarks.
itb"; i = 99; break
         case 9: return
         case 10: let e.deci=5; let e.lnum=14; let e.lstr=15; stop
         otherwise: at 15,6 output "This is not a valid option number, please re
enter the option number."; break
      endtest
   endwhile
   FORM FILLBLNK
           AT 15,6 TO 15,80 PUT "FWBU"
           AT 15,6 PUT "
            "
   ENDFORM
   putform fillblnk
   j = 0
   while j < 10 do
      opnumbcb = 1
      at 22,58 input opnumbcb
      test opnumbcb
         case 0: perform "b:helpscrn.ipf"; clear; putform menubc1a; at 14,58 out
put opnumbca; break
         case 1: j = 99; break
```

```
        case 2: j = 99; break
        otherwise: at 24,6 output "This is not a valid option number, please re
enter the option number."; break
        endtest
    endwhile
    k = 0
    while k < 11 do
       info = ""
       clear
       perform "b:menubc1b.ipf"
       putform menubc1b
       at 10,34 input info using "rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr"
       if info eq "0" then perform "b:helpscrn.ipf"
          else k = 99
       endif
    endwhile
    if opnumbca ge 1 and opnumbca le 7 then
       if opnumbcb = 1 then
          if info eq "" then browse
             else browse for ^info
          endif
       else
          if opnumbcb = 2 then
             formname = ""
             test opnumbca
                case 1: perform "b:quart1.ipf"; formname = "quart1"; break
                case 2: perform "b:quart2.ipf"; formname = "quart2"; break
                case 3: perform "b:quart3.ipf"; formname = "quart3"; break
                case 4: perform "b:quart4.ipf"; formname = "quart4"; break
                case 5: perform "b:quart5.ipf"; formname = "quart5"; break
                case 6: perform "b:quart6.ipf"; formname = "quart6"; break
                case 7: perform "b:quart7.ipf"; formname = "quart7"; break
             endtest
             if info eq "" then browse with ^formname
                else browse for ^info with ^formname
             endif
          endif
       endif
    endif
    if opnumbca = 8 then
       if opnumbcb = 1 then
          if info eq "" then browse suppform
             else browse suppform for ^info
          endif
          bron = suppform.credoid#
          browse compspec for credoid = bron
          browse designs for credoid = bron
          browse opduty for credoid = bron
          browse maininsp for credoid = bron
          browse environ for credoid = bron
          browse remarks for credoid = bron
       endif
       if opnumbcb = 2 then
          perform "b:quart1.ipf"
          perform "b:quart2.ipf"
          perform "b:quart3.ipf"
          perform "b:quart4.ipf"
          perform "b:quart5.ipf"
          perform "b:quart6.ipf"
          perform "b:quart7.ipf"
          if info eq "" then browse suppform with quart1
             else browse suppform for ^info with quart1
          endif
          bron = suppform.credoid#
          browse compspec for credoid = bron with quart2
          browse designs for credoid = bron with quart3
          browse opduty for credoid = bron with quart4
          browse maininsp for credoid = bron with quart5
          browse environ for credoid = bron with quart6
          browse remarks for credoid = bron with quart7
       endif
    endif
    opnumbca = 0
    opnumbcb = 1
endwhile
```

MENUBC1A IPF

this procedure called by cmenubc1.ipf

```
FORM MENUBC1A
        AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 20 PUT "BROWSE/CHANGE/ADD TO EXISTING DATA RECORDS"
        AT 4, 20 PUT "----------------------------------------"
        AT 6, 6 PUT "You may work with all of the tables or just one of them.  D
o you want to "
        AT 7, 6 PUT "work with:"
        AT 9, 11 PUT "1. SUPPFORM            5. MAININSP            9. Return to
 previous"
        AT 10, 11 PUT "2. COMPSPEC            6. ENVIRON                menu"
        AT 11, 11 PUT "3. DESIGNS             7. REMARKS            10. Quit thi
s program"
        AT 12, 11 PUT "4. OPDUTY              8. All"
        AT 14, 6 PUT "Enter option number or \"0\" for further information:"
        AT 17, 6 PUT "You may work with this(these) table(s) "
        AT 19, 11 PUT "1. Using the raw table structure, or"
        AT 20, 11 PUT "2. Using a form (the form takes a little more time)"
        AT 22, 6 PUT "Enter option number or \"0\" for further information:"
ENDFORM
```

```
                BROWSE/CHANGE/ADD TO EXISTING DATA RECORDS
                ------------------------------------------

  You may work with all of the tables or just one of them.  Do you want to
  work with:

       1. SUPPFORM            5. MAININSP            9. Return to previous
       2. COMPSPEC            6. ENVIRON                menu
       3. DESIGNS             7. REMARKS            10. Quit this program
       4. OPDUTY              8. All

  Enter option number or "0" for further information:  1


  You may work with this(these) table(s)

       1. Using the raw table structure, or
       2. Using a form (the form takes a little more time)

  Enter option number or "0" for further information: _1
```

MENUBC1B IPF

this procedure called by cmenubc1.ipf

```
FORM MENUBC1B
        AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 6 PUT "If you want to go to a specific record rather than \"paging
 through\" all"
        AT 4, 6 PUT "of the records, enter the following information:"
        AT 6, 11 PUT "[fieldname] EQ, LT, GT, LE, GE, IN or NE [condition]"
        AT 8, 11 PUT "(EQ = equals, LT = less than, GT = greater than, etc.)"
        AT 10, 6 PUT "Enter the information here:"
        AT 11, 6 PUT "(or \"0\" for further information)"
        AT 13, 11 PUT "(remember that the condition for a string variable must b
e in quotes;"
        AT 14, 11 PUT " when working with all tables, use only SUPPFORM fieldnam
es here)"
        AT 16, 6 PUT "When you are working with a table:"
        AT 18, 9 PUT "[ctrl] F obtains the next record"
        AT 19, 9 PUT "[ctrl] A obtains the previous record"
        AT 20, 9 PUT "to change a field value press return to enter the record a
nd [ctrl] F "
        AT 21, 12 PUT "to reach the desired field, then re-input the data"
        AT 23, 6 PUT "When you have finished working with a table, press \"esc\"
."
ENDFORM
```

```
If you want to go to a specific record rather than "paging through" all
of the records, enter the following information:

     [fieldname] EQ, LT, GT, LE, GE, IN or NE [condition]

     (EQ = equals, LT = less than, GT = greater than, etc.)

Enter the information here: ____________________________________________
(or "0" for further information)

     (remember that the condition for a string variable must be in quotes;
      when working with all tables, use only SUPPFORM fieldnames here)

When you are working with a table:

   [ctrl] F obtains the next record
   [ctrl] A obtains the previous record
   to change a field value press return to enter the record and [ctrl] F
      to reach the desired field, then re-input the data

When you have finished working with a table, press "esc".
```

this procedure called by cmenubc1.ipf

QUART1 IPF

```
FORM QUART1
        AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 3 PUT "COMPONENT IDENTIFICATION        (SUPPFORM Table)"
        AT 4, 3 PUT "-------------------------"
        AT 6, 6 PUT "(a)  CREDO ID Number"
        AT 6, 28 GET SUPPFORM.CREDOID#
        AT 6, 28 PUT SUPPFORM.CREDOID#
        AT 8, 6 PUT "(b)  Component Name  "
        AT 8, 27 GET SUPPFORM.COMPNAME
        AT 8, 27 PUT SUPPFORM.COMPNAME
        AT 10, 6 PUT "(c)  Supplementary Form"
        AT 10, 31 GET SUPPFORM.SUPPFORM
        AT 10, 31 PUT SUPPFORM.SUPPFORM
        AT 12, 6 PUT "(d)  Parameter Number"
        AT 12, 28 GET SUPPFORM.PARAMID#
        AT 12, 28 PUT SUPPFORM.PARAMID#
ENDFORM
```

```
COMPONENT IDENTIFICATION        (SUPPFORM Table)
-------------------------

   (a)  CREDO ID Number  __-____-__

   (b)  Component Name  ______________________________

   (c)  Supplementary Form  ______________________________

   (d)  Parameter Number  ________________
```

this procedure called by cmenubc1.ipf

QUART2 IPF

```
FORM QUART2
     AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 3 PUT "COMPONENT SPECIFICATIONS"
        AT 3, 34 PUT "(COMPSPEC Table)"
        AT 4, 3 PUT "-------------------------"
        AT 6, 6 PUT "(a)  CREDO ID Number"
        AT 6, 28 GET COMPSPEC.CREDOID
        AT 6, 28 PUT COMPSPEC.CREDOID
        AT 8, 6 PUT "(b)  Part of Plant Protective System (true or false)"
        AT 8, 60 GET COMPSPEC.PPS  LOGIC
        AT 8, 60 PUT COMPSPEC.PPS
        AT 10, 6 PUT "(c)  Manufacturer"
        AT 10, 25 GET COMPSPEC.MANUFACT
        AT 10, 25 PUT COMPSPEC.MANUFACT
        AT 12, 6 PUT "(d)  Code"
        AT 12, 17 GET COMPSPEC.CODE
        AT 12, 17 PUT COMPSPEC.CODE
        AT 14, 6 PUT "(e)  Spec./Standard No."
        AT 14, 31 GET COMPSPEC.SPECSTNO
        AT 14, 31 PUT COMPSPEC.SPECSTNO
        AT 16, 6 PUT "(f)  Safety/Quality No(s)."
        AT 16, 34 GET COMPSPEC.SAFEQC
        AT 16, 34 PUT COMPSPEC.SAFEQC
        AT 18, 6 PUT "(g)  Drawing No(s)."
        AT 18, 27 GET COMPSPEC.DRWGNUM
        AT 18, 27 PUT COMPSPEC.DRWGNUM
        AT 18, 50 PUT "Site (true or false)"
        AT 18, 72 GET COMPSPEC.SITE  LOGIC
        AT 18, 72 PUT COMPSPEC.SITE
        AT 19, 50 PUT "Mfg. (true or false)"
        AT 19, 72 GET COMPSPEC.MFG  LOGIC
        AT 19, 72 PUT COMPSPEC.MFG
        AT 20, 6 PUT "(h)  Date Installed"
        AT 20, 27 GET COMPSPEC.DATEIN
        AT 20, 27 PUT COMPSPEC.DATEIN
        AT 22, 6 PUT "(i)  Date Modified"
        AT 22, 26 GET COMPSPEC.MODIFIC
        AT 22, 26 PUT COMPSPEC.MODIFIC
        AT 24, 6 PUT "(j)  Date Removed"
        AT 24, 25 GET COMPSPEC.REMOVAL
        AT 24, 25 PUT COMPSPEC.REMOVAL
ENDFORM
```

```
COMPONENT SPECIFICATIONS        (COMPSPEC Table)
------------------------

   (a)  CREDO ID Number  __-____-__

   (b)  Part of Plant Protective System (true or false)  _____

   (c)  Manufacturer  ______________________________

   (d)  Code  ____

   (e)  Spec./Standard No.  ___-__-___-_,___

   (f)  Safety/Quality No(s).  __________

   (g)  Drawing No(s).  __________          Site (true or false)  _____
                                            Mfg. (true or false)  _____
   (h)  Date Installed  __-__-__

   (i)  Date Modified  __-__-__

   (j)  Date Removed  __-__-__
```

this procedure called by cmenubc1.ipf

QUART3 IPF

```
FORM QUART3
     AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 3 PUT "COMPONENT USE AND GENERAL DESIGN INFORMATION"
        AT 3, 54 PUT "(DESIGNS Table)"
        AT 4, 3 PUT "-----------------------------------------"
        AT 6, 6 PUT "(a)  CREDO ID Number"
        AT 6, 28 GET DESIGNS.CREDOID
        AT 6, 28 PUT DESIGNS.CREDOID
        AT 8, 6 PUT "(b)  Critical System (true or false)"
        AT 8, 44 GET DESIGNS.CRITSYS  LOGIC
        AT 8, 44 PUT DESIGNS.CRITSYS
        AT 10, 6 PUT "(c)  Design Function"
        AT 10, 28 GET DESIGNS.DESFUNC
        AT 10, 28 PUT DESIGNS.DESFUNC
        AT 13, 6 PUT "(d)  Application"
        AT 13, 24 GET DESIGNS.APPLICAT
        AT 13, 24 PUT DESIGNS.APPLICAT
        AT 16, 6 PUT "(e)  Design Life (hours)"
        AT 16, 32 GET DESIGNS.DESLIFE
        AT 16, 32 PUT DESIGNS.DESLIFE
        AT 18, 6 PUT "(f)  Design Life (cycles)"
        AT 18, 33 GET DESIGNS.DESLIFEC
        AT 18, 33 PUT DESIGNS.DESLIFEC
ENDFORM
```

```
COMPONENT USE AND GENERAL DESIGN INFORMATION        (DESIGNS Table)
-------------------------------------------

    (a)  CREDO ID Number  __-____-__

    (b)  Critical System (true or false)  _____

    (c)  Design Function  ____________________________________________________
_______

    (d)  Application  ________________________________________________________
___

    (e)  Design Life (hours)  ______.__

    (f)  Design Life (cycles)  ______.__
```

this procedure called by cmenubc1.ipf

QUART4 IPF

```
FORM QUART4
     AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 3 PUT "OPERATING AND DUTY FACTORS"
        AT 3, 36 PUT "(OPDUTY Table)"
        AT 4, 3 PUT "--------------------------"
        AT 6, 6 PUT "(a)  CREDO ID Number"
        AT 6, 28 GET OPDUTY.CREDOID
        AT 6, 28 PUT OPDUTY.CREDOID
        AT 8, 6 PUT "(b)  Operating Factors (percent)"
        AT 10, 11 PUT "(1)  Normal Operation"
        AT 10, 34 GET OPDUTY.NORMOP
        AT 10, 34 PUT OPDUTY.NORMOP
        AT 12, 11 PUT "(2)  Degraded Operation"
        AT 12, 36 GET OPDUTY.DEGOP
        AT 12, 36 PUT OPDUTY.DEGOP
        AT 14, 11 PUT "(3)  Shutdown Operation"
        AT 14, 36 GET OPDUTY.SHUTOP
        AT 14, 36 PUT OPDUTY.SHUTOP
        AT 16, 6 PUT "(c)  Duty Factors (cycling rate per hour)"
        AT 18, 11 PUT "(1)  Normal Operation"
        AT 18, 34 GET OPDUTY.NORMCY
        AT 18, 34 PUT OPDUTY.NORMCY
        AT 20, 11 PUT "(2)  Degraded Operation"
        AT 20, 36 GET OPDUTY.DEGCY
        AT 20, 36 PUT OPDUTY.DEGCY
        AT 22, 11 PUT "(3)  Shutdown Operation"
        AT 22, 36 GET OPDUTY.SHUTCY
        AT 22, 36 PUT OPDUTY.SHUTCY
ENDFORM
```

```
OPERATING AND DUTY FACTORS        (OPDUTY Table)
--------------------------

   (a)  CREDO ID Number  __-____-__

   (b)  Operating Factors (percent)

        (1)  Normal Operation  ___.____

        (2)  Degraded Operation  ___.____

        (3)  Shutdown Operation  ___.____

   (c)  Duty Factors (cycling rate per hour)

        (1)  Normal Operation  _____.____

        (2)  Degraded Operation  _____.____

        (3)  Shutdown Operation  _____.____
```

this procedure called by cmenubc1.ipf

QUART5 IPF

```
FORM QUART5
     AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 3 PUT "MAINTENANCE AND INSPECTION/TEST DATA"
        AT 3, 46 PUT "(MAININSP Table)"
        AT 4, 3 PUT "-----------------------------------"
        AT 6, 6 PUT "(a)  CREDO ID Number"
        AT 6, 28 GET MAININSP.CREDOID
        AT 6, 28 PUT MAININSP.CREDOID
        AT 8, 6 PUT "(b)  Maintenance Interval and Type"
        AT 8, 42 GET MAININSP.MAININTY
        AT 8, 42 PUT MAININSP.MAININTY
        AT 11, 6 PUT "(c)  Inspection/Test Interval and Type"
        AT 11, 46 GET MAININSP.INSPTIT
        AT 11, 46 PUT MAININSP.INSPTIT
ENDFORM
```

```
MAINTENANCE AND INSPECTION/TEST DATA        (MAININSP Table)
-----------------------------------

   (a)  CREDO ID Number  __-____-__

   (b)  Maintenance Interval and Type  _____
---------------------

   (c)  Inspection/Test Interval and Type  _____
--------------------------
```

this procedure called by cmenubc1.ipf

QUART6 IPF

```
FORM QUART6
     AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 3 PUT "RADIATION EXPOSURE"
        AT 3, 28 PUT "(ENVIRON Table)"
        AT 4, 3 PUT "------------------"
        AT 6, 6 PUT "(a)  CREDO ID Number"
        AT 6, 28 GET ENVIRON.CREDOID
        AT 6, 28 PUT ENVIRON.CREDOID
        AT 8, 6 PUT "(b)  Neutron Flux Level (neutrons/cm2-sec)"
        AT 8, 50 GET ENVIRON.NFLUX
        AT 8, 50 PUT ENVIRON.NFLUX
        AT 10, 6 PUT "(c)  Tritium Environment (uCi/cm3)"
        AT 10, 42 GET ENVIRON.TRITENV
        AT 10, 42 PUT ENVIRON.TRITENV
ENDFORM
```

RADIATION EXPOSURE (ENVIRON Table)

(a) CREDO ID Number __-____-__

(b) Neutron Flux Level (neutrons/cm2-sec) _____.____

(c) Tritium Environment (uCi/cm3) _____.______

this procedure called by cmenubc1.ipf

QUART7 IPF

```
FORM QUART7
     AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 3 PUT "REMARKS, SPECIAL INFORMATION"
        AT 3, 38 PUT "(REMARKS Table)"
        AT 4, 3 PUT "---------------------------"
        AT 6, 6 PUT "(a)  CREDO ID Number"
        AT 6, 28 GET REMARKS.CREDOID
        AT 6, 28 PUT REMARKS.CREDOID
        AT 8, 6 PUT "(b)  Remarks"
        AT 8, 20 GET REMARKS.REMARKS
        AT 8, 20 PUT REMARKS.REMARKS
ENDFORM
```

REMARKS, SPECIAL INFORMATION (REMARKS Table)

(a) CREDO ID Number __-____-__

(b) Remarks _____

this procedure called by cmenub1.ipf

CMENUBC2 IPF

```
/* file name:  cmenubc2.ipf */

/* This is the program to create new data records in the base */
/* engineering data */

/* Put up the menu and ask the user which table(s) they want to */
/* work with and whether they want to use the raw table structure */
/* or a form to work with the table(s) */

let e.deci = 0
let e.lnum = 2
let e.lstr = 80
let e.lmod = false
opnumbca = 0
while opnumbca < 11 do
   let e.serr = true
   finish all
   let e.serr = false
   clear
   perform "b:menubc2.ipf"
   putform menubc2
   i = 0
   while i < 10 do
      tabl = ""
      at 14,58 input opnumbca
      test opnumbca
         case 0: perform "b:helpscrn.ipf"; putform menubc2; break
         case 1: use "b:suppform.itb"; tabl = "suppform"; i = 99; break
         case 2: use "b:compspec.itb"; tabl = "compspec"; i = 99; break
         case 3: use "b:designs.itb"; tabl = "designs"; i = 99; break
         case 4: use "b:opduty.itb"; tabl = "opduty"; i = 99; break
         case 5: use "b:maininsp.itb"; tabl = "maininsp"; i = 99; break
         case 6: use "b:environ.itb"; tabl = "environ"; i = 99; break
         case 7: use "b:remarks.itb"; tabl = "remarks"; i = 99; break
         case 8: use "b:suppform.itb"; use "b:compspec.itb"; use "b:designs.itb"
; use "b:opduty.itb"; use "b:maininsp.itb"; use "b:environ.itb"; use "b:remarks.
itb"; i = 99; break
         case 9: return
         case 10: let e.deci=5; let e.lnum=14; let e.lstr=15; let e.lmod = true;
 stop
         otherwise: at 15,6 output "This is not a valid option number, please re
enter the option number."; break
      endtest
   endwhile
   FORM FILLBLNK
           AT 15, 6 TO 15, 80 PUT "FWBU"
           AT 15, 6 PUT "
             "
   ENDFORM
   putform fillblnk
   j = 0
   while j < 10 do
      opnumbcb = 1
      at 21,58 input opnumbcb
      test opnumbcb
         case 0: perform "b:helpscrn.ipf"; clear; putform menubc2; at 14, 58 out
put opnumbca; break
         case 1: j = 99; break
         case 2: j = 99; break
         otherwise: at 22,6 output "This is not a valid option number, please re
enter the option number."; break
      endtest
   endwhile
   if opnumbca ge 1 and opnumbca le 7 then
      if opnumbcb = 1 then create record for ^tabl
      else
         if opnumbcb = 2 then
            formname = ""
            test opnumbca
               case 1: perform "b:quart1.ipf"; formname = "quart1"; break
               case 2: perform "b:quart2.ipf"; formname = "quart2"; break
               case 3: perform "b:quart3.ipf"; formname = "quart3"; break
               case 4: perform "b:quart4.ipf"; formname = "quart4"; break
               case 5: perform "b:quart5.ipf"; formname = "quart5"; break
               case 6: perform "b:quart6.ipf"; formname = "quart6"; break
               case 7: perform "b:quart7.ipf"; formname = "quart7"; break
            endtest
            create record for ^tabl with ^formname
         endif
      endif
   endif
   if opnumbca = 8 then
      if opnumbcb = 1 then
         create record for suppform
         create record for compspec
         create record for designs
         create record for opduty
         create record for maininsp
         create record for environ
         create record for remarks
      endif
      if opnumbcb = 2 then
         perform "b:quart1.ipf"
         perform "b:quart2.ipf"
         perform "b:quart3.ipf"
         perform "b:quart4.ipf"
         perform "b:quart5.ipf"
         perform "b:quart6.ipf"
         perform "b:quart7.ipf"
         create record for suppform with quart1
         create record for compspec with quart2
         create record for designs with quart3
         create record for opduty with quart4
         create record for maininsp with quart5
         create record for environ with quart6
         create record for remarks with quart7
      endif
   endif
   opnumbca = 0
   opnumbcb = 1
endwhile
```

MENUBC2 IPF

this procedure called by cmenubc2.ipf

```
FORM MENUBC2
     AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 28 PUT "CREATING NEW DATA RECORDS"
        AT 4, 28 PUT "-------------------------"
        AT 6, 6 PUT "You may work with all of the tables or just one of them.  D
o you want to "
        AT 7, 6 PUT "work with:"
        AT 9, 11 PUT "1. SUPPFORM            5. MAININSP            9. Return to
 previous"
        AT 10, 11 PUT "2. COMPSPEC            6. ENVIRON                menu"
        AT 11, 11 PUT "3. DESIGNS             7. REMARKS            10. Quit thi
s program"
        AT 12, 11 PUT "4. OPDUTY              8. All"
        AT 14, 6 PUT "Enter option number or \"0\" for further information:"
        AT 16, 6 PUT "You may work with this(these) table(s) "
        AT 18, 11 PUT "1. Using the raw table structure, or"
        AT 19, 11 PUT "2. Using a form (the form takes a little more time)"
        AT 21, 6 PUT "Enter option number or \"0\" for further information:"
        AT 23, 6 PUT "When you have finished creating records for a table, press
 return until"
        AT 24, 6 PUT "you get to the next blank record then press \"esc\"."
ENDFORM
```

```
                        CREATING NEW DATA RECORDS
                        -------------------------

  You may work with all of the tables or just one of them.  Do you want to
  work with:

       1. SUPPFORM            5. MAININSP            9. Return to previous
       2. COMPSPEC            6. ENVIRON                menu
       3. DESIGNS             7. REMARKS            10. Quit this program
       4. OPDUTY              8. All

  Enter option number or "0" for further information:  1

  You may work with this(these) table(s)

       1. Using the raw table structure, or
       2. Using a form (the form takes a little more time)

  Enter option number or "0" for further information: _1

  When you have finished creating records for a table, press return until
  you get to the next blank record then press "esc".
```

CMENUBC3 IPF

this procedure called by cmenubc1.ipf

```
/* file name:  cmenubc3.ipf */

/* This is the program to delete existing records in the base */
/* engineering data */

/* Put up the menu and ask the user which table(s) they want to */
/* work with */

let e.deci = 0
let e.lnum = 2
let e.lstr = 80
opnumbca = 0
while opnumbca < 11 do
   let e.serr = true
   finish all
   let e.serr = false
   clear
   perform "b:menubc3a.ipf"
   putform menubc3a
   i = 0
   while i < 10 do
      tabl = ""
      at 17,58 input opnumbca
      test opnumbca
         case 0: perform "b:helpscrn.ipf"; putform menubc3a; break
         case 1: use "b:suppform.itb"; tabl = "suppform"; i = 99; break
         case 2: use "b:compspec.itb"; tabl = "compspec"; i = 99; break
         case 3: use "b:designs.itb"; tabl = "designs"; i = 99; break
         case 4: use "b:opduty.itb"; tabl = "opduty"; i = 99; break
         case 5: use "b:maininsp.itb"; tabl = "maininsp"; i = 99; break
         case 6: use "b:environ.itb"; tabl = "environ"; i = 99; break
         case 7: use "b:remarks.itb"; tabl = "remarks"; i = 99; break
         case 8: use "b:suppform.itb"; use "b:compspec.itb"; use "b:designs.itb"
; use "b:opduty.itb"; use "b:maininsp.itb"; use "b:environ.itb"; use "b:remarks.
itb"; i = 99; break
         case 9: return
         case 10: let e.deci=5; let e.lnum=14; let e.lstr=15; stop
         otherwise: at 19,6 output "This is not a valid option number, please re
enter the option number."; break
      endtest
   endwhile
   j = 0
   while j < 11 do
      info = ""
      clear
      perform "b:menubc3b.ipf"
      putform menubc3b
      at 11,34 input info using "rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr"
      if info eq "0" then perform "b:helpscrn.ipf"
         else j = 99
      endif
   endwhile
   if opnumbca ge 1 and opnumbca le 7 then
      if info eq "" then browse
```

```
      else browse for ^info
   endif
   at 15,3 output "The record shown above will be deleted from the table."
   at 17,3 output "Are you sure you want to delete this record? (y or n)"
   j = 0
   while j < 10 do
      goon = "y"
      at 17,58 input goon using "r"
      test goon
         case "n": j = 99; break
         case "y": mark in ^tabl with true current; compress ^tabl; j = 99; b
reak
         otherwise: at 20,3 output "This is not a valid option, please reente
r the option."; break
      endtest
   endwhile
endif
if opnumbca = 8 then
   if info eq "" then browse suppform
      else browse suppform for ^info
   endif
   at 15,3 output "All records with the CREDO ID # shown above will be delete
d from all"
   at 16,3 output "of the tables."
   at 18,3 output "Are you sure you want to delete these records? (y or n)"
   j = 0
   while j < 10 do
      goon = "y"
      at 18,60 input goon using "r"
      test goon
         case "n": j = 99; break
         case "y": mark in suppform with true current; bron = suppform.credoi
d#; compress suppform
            mark in compspec with true for credoid = bron; compress compspec
            mark in designs with true for credoid = bron; compress designs
            mark in opduty with true for credoid = bron; compress opduty
            mark in maininsp with true for credoid = bron; compress maininsp
            mark in environ with true for credoid = bron; compress environ
            mark in remarks with true for credoid = bron; compress remarks
            j = 99; break
         otherwise: at 21,3 output "This is not a valid option, please reente
r the option."; break
      endtest
   endwhile
endif
opnumbca = 0
endwhile
```

MENUBC3A IPF

this procedure called by <menubc3.ipf

```
FORM MENUBC3A
     AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 6, 25 PUT "DELETING EXISTING DATA RECORDS"
        AT 7, 25 PUT "-----------------------------"
        AT 9, 6 PUT "You may work with all of the tables or just one of them.  D
o you want to "
        AT 10, 6 PUT "work with:"
        AT 12, 11 PUT "1. SUPPFORM            5. MAININSP            9. Return t
o previous"
        AT 13, 11 PUT "2. COMPSPEC            6. ENVIRON                menu"
        AT 14, 11 PUT "3. DESIGNS             7. REMARKS            10. Quit thi
s program"
        AT 15, 11 PUT "4. OPDUTY              8. All"
        AT 17, 6 PUT "Enter option number or \"0\" for further information:"
ENDFORM
```

```
                    DELETING EXISTING DATA RECORDS
                    ------------------------------

You may work with all of the tables or just one of them.  Do you want to
work with:

     1. SUPPFORM            5. MAININSP            9. Return to previous
     2. COMPSPEC            6. ENVIRON                menu
     3. DESIGNS             7. REMARKS            10. Quit this program
     4. OPDUTY              8. All

Enter option number or "0" for further information: __
```

MENUBC3B IPF

this procedure called by cmenubc3.ipf

```
FORM MENUBC3B
        AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 6 PUT "You may delete one record at a time by going to the record
and pressing"
        AT 4, 6 PUT "\"esc\".  If you want to go to a specific record rather tha
n \"paging"
        AT 5, 6 PUT "through all of the records, enter the following information
:"
        AT 7, 11 PUT "[fieldname] EQ, LT, GT, LE, GE, IN or NE [condition]"
        AT 9, 11 PUT "(EQ = equals, LT = less than, GT = greater than, etc.)"
        AT 11, 6 PUT "Enter the information here:"
        AT 12, 6 PUT "(or \"0\" for further information)"
        AT 14, 11 PUT "(remember that the condition for a string variable must b
e in quotes;"
        AT 15, 11 PUT " when working with all tables, use only SUPPFORM fieldnam
es here)"
        AT 17, 6 PUT "When you are working with a table:"
        AT 19, 9 PUT "[ctrl] F obtains the next record"
        AT 20, 9 PUT "[ctrl] A obtains the previous record"
ENDFORM
```

```
You may delete one record at a time by going to the record and pressing
"esc".  If you want to go to a specific record rather than "paging
through all of the records, enter the following information:

     [fieldname] EQ, LT, GT, LE, GE, IN or NE [condition]

     (EQ = equals, LT = less than, GT = greater than, etc.)

Enter the information here: ____________________________________________
(or "0" for further information)

     (remember that the condition for a string variable must be in quotes;
      when working with all tables, use only SUPPFORM fieldnames here)

When you are working with a table:

   [ctrl] F obtains the next record
   [ctrl] A obtains the previous record
```

CBEDFORM IPF

this procedure called by cmenub1.ipf

```
/* procedure file "b:cbedform.ipf" */

/* This procedure makes one continuous form for the CREDO Base */
/* Engineering Data Form and fills it out ready to send to CREDO */

/* put tables used in this procedure into use */

let e.serr = true
use "b:suppform.itb"
use "b:compspec.itb"
use "b:designs.itb"
use "b:opduty.itb"
use "b:maininsp.itb"
use "b:environ.itb"
use "b:remarks.itb"
let e.serr = false

/* set the initial value of the report date and the CREDO ID# */

local rdate = 010101
local credonum = "0"

/* set up a while loop to print more than one form when this */
/* procedure is called */

local another = true
while another do

/* clear the screen and ask the user what the report date is and */
/* which records they want printed out */

clear
let e.lstr = 80
at 3,18; output "PRINTING A CREDO BASE ENGINEERING DATA FORM"
at 4,18; output "----------------------------------------"
at 8,3; output "What is the report date?"
at 11,10; output "__/__/__"
at 11,10; input rdate using "dd/dd/dd"
at 14,3; output "What is the CREDO ID# of the component that you want to print a
 data form for?"
at 15,3; output "(if you don't know the number, enter one zero)"
at 17,10; output "__-____-__"
at 17,10; input credonum using "rr-dddd-dd"

/* if the user doesn't know the CREDO ID# ask them whether they want */
/* to browse SUPPFORM to find the number or to quit this program */

local br = "_" using "r"; local qt = "_" using "r"; local chosen=false
if credonum = "0 -    -  " then at 20,3; output "Do you want to browse the SUPPF
ORM table to find the ID# or quit this";
 at 21,3; output "procedure ? (x your choice; for browsing, press esc when you f
ind the number)"; at 23,10; output "_ browse      _ quit"; let e.lstr = 1; at 23,
10; input br using "r";
if br = "x" then chosen = true; else br = "_"; endif; at 23,10; output br; if ch
osen = false then at 23,23; input qt using "r"; if qt = "x" then chosen = true;
else qt = "_"; endif; at 23,23; output qt; endif; if qt = "x" then return;
else browse suppform; credonum = suppform.credoid#; endif; endif; let e.lstr = 8
0
```

```
/* set initial values of local variables */

local site = "LANL"
local unit = "TSTA"
local new = "x"
local chng = "_"
local delete = "_"
local pdate = 010101

/* obtain correct record from each table for selected CREDO ID# */

let e.supd = true
obtain from suppform for credoid# = credonum
obtain from compspec for credoid = credonum
obtain from designs for credoid = credonum
obtain from opduty for credoid = credonum
obtain from maininsp for credoid = credonum
obtain from environ for credoid = credonum
obtain from remarks for credoid = credonum

/* suppress display of CREDO code name */

bob = 1

perform "b:namekey1.ipf"
local model# = ""

let e.supd = false

/* load the first part of this form (form test1a.ipf) and print */
/* it out */

let e.pwid=80
let e.pdep=63
print chr(27)"M",
print chr(27)"3"chr(32),
print chr(27)"l"chr(7),

perform "b:test1a.ipf"
print test1a with get

/* load the second part of this form (form test2a.ipf and form */
/* test3a.ipf) and print it out */

/* set values for compspec.pps, compspec.site and compspec.mfg */

local ppsyes = ""
local ppsno = ""
local sitetrue = ""
local mfgtrue = ""
if compspec.pps = true then ppsyes = "x"; ppsno = "_"; else
ppsyes = "_"; ppsno = "x"; endif
if compspec.site = false or compspec.mfg = false then sitetrue = "_";
mfgtrue = "_"; endif
if compspec.site = true then sitetrue = "x"; endif
if compspec.mfg = true then sitemfg = "x"; endif
```

```
perform "b:test2a.ipf"
perform "b:test3a.ipf"
print test2a with get
print test3a with get

/* load the third part of this form (form test4a.ipf) and print */
/* it out */

/* set values for designs.critsys */

local system = "TRITIUM"
local subsyst = "TWT"
local csysyes = ""
local csysno = ""
if designs.critsys = true then csysyes = "x"; csysno = "_"; else
csysyes = "_"; csysno = "x"; endif

perform "b:test4a.ipf"
print test4a with get

/* load the fourth and fifth parts of this form (form test5a.ipf) */
/* and print it out */

perform "b:test5a.ipf"
print test5a with get

/* load the sixth part of this form (form test6a.ipf) and print */
/* it out */

eject
perform "b:test6a.ipf"
print test6a with get

/* load the seventh part of this form (form test7a.ipf) and print */
/* it out */

perform "b:test7a.ipf"
print test7a with get

/* load the eighth part of this form (form test8a.ipf) and print */
/* it out */

perform "b:test8a.ipf"
print test8a with get

/* load the ninth part of this form (form test9a.ipf) and print */
/* it out */

perform "b:test9a.ipf"
print test9a with get
eject

/* clear the screen and ask the user whether they want to print */
/* another form or quit this procedure */

let e.pwid=120
let e.pdep=60
print chr(27)"@",
clear
local pr = "_" using "r"; local qt = "_" using "r"; local another = false
at 14,10; output "Do you want to print another form or quit this procedure?"; at
 15,10; output "(x your choice)"; at 17,20; output "_ print another form   _ qui
t"; let e.lstr = 1; at 17,20; input pr using "r";
if pr = "x" then another = true; else pr = "_"; endif; at 17,20; output pr;
if another = false then at 17,43; input qt using "r"; at 17,43; output qt; endif
; if qt = "x" then let e.lstr=80; return; else continue; endif; let e.lstr = 80
endwhile

return
```

NAMEKEY1 IPF

this procedure called by cbedform.ipf

```
/* procedure "b:namekey1.ipf" */
/* this file contains the CREDO name code for the TWT components */
/* only.  For the remainder of the codes, see the file */
/* "b:namekey.ipf" */

local dim x(12,3),y(12)
i=1
j=3
while i<=12 do
  x(i,j)="";
  i=i+1;
endwhile
x(1,1)="electric heaters"
x(1,2)="electric heater"
y(1)="eheater"
x(2,1)="filters/strainers"
x(2,2)="filter/strainer"
y(2)="filter"
x(3,1)="gas dryers"
x(3,2)="gas dryer"
y(3)="gasdryer"
x(4,1)="instrument controllers"
x(4,2)="instrument controller"
y(4)="instcntl"
x(5,1)="mechanical pumps"
x(5,2)="mechanical pump"
y(5)="mechpump"
x(6,1)="nonnuclear sensors"
x(6,2)="nonnuclear sensor"
y(6)="nnsensor"
x(7,1)="nuclear detectors"
x(7,2)="nuclear detector"
y(7)="detector"
x(8,1)="pipe and fittings"
x(8,2)="pipe and fitting"
y(8)="pipe"
x(9,1)="pressure vessels and tanks"
x(9,2)="pressure vessel and tank"
x(9,3)="pressure vessels & tanks"
y(9)="pvessel"
x(10,1)="recombiners"
x(10,2)="recombiner"
y(10)="recomb"
x(11,1)="valves"
x(11,2)="valve"
y(11)="valve"
x(12,1)="gas movers"
x(12,2)="gas mover"
y(12)="gasmover"
supp=suppform.suppform
notfound=true
j=1
  while j<=3 do
    i=1
    while notfound and i<=12 do
      if supp=x(i,j) then
        name=y(i);
        notfound=false;
      else
        i=i+1;
      endif
    endwhile
    j=j+1;
  endwhile
return
```

TEST1A IPF

this procedure called by cbedform.ipf

```
FORM TEST1A
        AT 1, 23 PUT "CREDO BASE ENGINEERING DATA FORM"
        AT 3, 1 PUT "1.  REPORT IDENTIFICATION"
        AT 3, 51 PUT "(a) Report ID No. "
        AT 3, 69 PUT "_________"
        AT 4, 5 PUT "----------------------"
        AT 5, 5 PUT "(b) Site*"
        AT 5, 16 GET SITE  STR USING "rrrrrrrr"
        AT 5, 16 PUT SITE  USING "rrrrrrrr"
        AT 5, 40 PUT "(c) Unit*"
        AT 5, 51 GET UNIT  STR USING "rrrrrrrr"
        AT 5, 51 PUT UNIT  USING "rrrrrrrr"
        AT 7, 5 PUT "(d) Report Date (Mo./Da./Yr.) "
        AT 7, 35 GET RDATE  NUM USING "dd/dd/dd"
        AT 7, 35 PUT RDATE  USING "dd/dd/dd"
        AT 9, 5 PUT "(e) Report Status: "
        AT 9, 24 GET NEW  STR USING "r"
        AT 9, 24 PUT NEW
        AT 9, 26 PUT "New"
        AT 9, 34 GET CHNG  STR USING "r"
        AT 9, 34 PUT CHNG
        AT 9, 36 PUT "Change"
        AT 9, 47 GET DELETE  STR USING "r"
        AT 9, 47 PUT DELETE
        AT 9, 49 PUT "Delete (CREDO use only)"
        AT 11, 9 PUT "If not \"New\", Date of Previous Report (Mo./Da./Yr.) "
        AT 11, 61 GET PDATE  NUM USING "dd/dd/dd"
        AT 11, 61 PUT PDATE  USING "dd/dd/dd"
        AT 12, 1 PUT "------------------------------------------------------------
----------------------"
ENDFORM
```

TEST2A IPF

this procedure called by cbedform.ipf

```
FORM TEST2A
        AT 1, 1 PUT "2.  COMPONENT IDENTIFICATION"
        AT 2, 5 PUT "-------------------------"
        AT 3, 5 PUT "(a) Name* "
        AT 3, 16 GET NAME  STR USING "rrrrrrrr"
        AT 3, 16 PUT NAME  USING "rrrrrrrr"
        AT 3, 28 PUT "(b) Site ID No. "
        AT 3, 45 GET SUPPFORM.PARAMID#  STR USING "rrr-r-rrrrr"
        AT 3, 45 PUT SUPPFORM.PARAMID#  USING "rrr-r-rrrrr"
        AT 3, 58 PUT "(c) Plant Protective"
ENDFORM
```

TEST3A IPF

this procedure called by cbedform.ipf

```
FORM TEST3A
        AT 1, 62 PUT "System"
        AT 1, 69 GET PPSYES  STR
        AT 1, 69 PUT PPSYES
        AT 1, 71 PUT "yes"
        AT 1, 75 GET PPSNO  STR
        AT 1, 75 PUT PPSNO
        AT 1, 77 PUT "no"
        AT 3, 5 PUT "(d) CREDO ID NO. "
        AT 3, 23 GET COMPSPEC.CREDOID
        AT 3, 23 PUT COMPSPEC.CREDOID
        AT 3, 31 PUT "(CREDO use only)"
        AT 3, 52 PUT "(e) Model No. "
        AT 3, 66 GET MODEL#  USING "rrrrrrrrrrrrr"
        AT 3, 66 PUT MODEL#  USING "rrrrrrrrrrrrr"
        AT 5, 5 PUT "(f) Manufacturer "
        AT 5, 23 GET COMPSPEC.MANUFACT
        AT 5, 23 PUT COMPSPEC.MANUFACT
        AT 5, 62 PUT "(Code)"
        AT 5, 69 GET COMPSPEC.CODE
        AT 5, 69 PUT COMPSPEC.CODE
        AT 7, 5 PUT "(g) Spec./Standard No. "
        AT 7, 29 GET COMPSPEC.SPECSTNO
        AT 7, 29 PUT COMPSPEC.SPECSTNO
        AT 9, 5 PUT "(h) Safety/Quality Class(es) "
        AT 9, 34 GET COMPSPEC.SAFEQC  NUM
        AT 9, 34 PUT COMPSPEC.SAFEQC
        AT 11, 5 PUT "(i) Drawing No(s)."
        AT 11, 25 GET COMPSPEC.DRWGNUM  STR
        AT 11, 25 PUT COMPSPEC.DRWGNUM
        AT 11, 49 GET SITETRUE
        AT 11, 49 PUT SITETRUE
        AT 11, 51 PUT "Site"
        AT 11, 58 GET MFGTRUE
        AT 11, 58 PUT MFGTRUE
        AT 11, 60 PUT "Mfg."
        AT 13, 5 PUT "(j) Date Installed "
        AT 13, 24 GET COMPSPEC.DATEIN
        AT 13, 24 PUT COMPSPEC.DATEIN  USING "dd/dd/dd"
        AT 13, 38 PUT "Modified"
        AT 13, 47 GET COMPSPEC.MODIFIC
        AT 13, 47 PUT COMPSPEC.MODIFIC  USING "dd/dd/dd"
        AT 13, 61 PUT "Removed"
        AT 13, 69 GET COMPSPEC.REMOVAL
        AT 13, 69 PUT COMPSPEC.REMOVAL  USING "dd/dd/dd"
        AT 14, 24 PUT "Mo.Da.Yr."
        AT 14, 47 PUT "Mo.Da.Yr."
        AT 14, 69 PUT "Mo.Da.Yr."
        AT 15, 1 PUT "-------------------------------------------------------------------------------
-----------------------"
ENDFORM
```

TEST4A IPF

this procedure called by cbedform.ipf

```
FORM TEST4A
        AT 1, 1 PUT "3.  COMPONENT USE AND GENERAL DESIGN INFORMATION"
        AT 2, 5 PUT "-------------------------------------------------"
        AT 3, 5 PUT "(a) System"
        AT 3, 17 PUT SYSTEM
        AT 3, 17 GET SYSTEM
        AT 3, 42 PUT "Critical System"
        AT 3, 59 PUT CSYSYES  USING "r"
        AT 3, 59 GET CSYSYES  USING "r"
        AT 3, 61 PUT "yes"
        AT 3, 66 PUT CSYSNO  USING "r"
        AT 3, 66 GET CSYSNO  USING "r"
        AT 3, 68 PUT "no"
        AT 5, 5 PUT "(b) Subsystem"
        AT 5, 20 PUT SUBSYST
        AT 5, 20 GET SUBSYST
        AT 7, 5 PUT "(c) Design Function"
        AT 7, 26 PUT DESIGNS.DESFUNC STR
        AT 7, 26 GET DESIGNS.DESFUNC
        AT 11, 5 PUT "(d) Application"
        AT 11, 22 PUT DESIGNS.APPLICAT STR
        AT 11, 22 GET DESIGNS.APPLICAT
        AT 15, 5 PUT "(e) Design Life"
        AT 15, 22 PUT DESIGNS.DESLIFE NUM
        AT 15, 22 GET DESIGNS.DESLIFE
        AT 15, 37 PUT "(hrs.)"
        AT 15, 47 PUT DESIGNS.DESLIFEC NUM
        AT 15, 47 GET DESIGNS.DESLIFEC
        AT 15, 61 PUT "(cycles)"
        AT 16, 1 PUT "-------------------------------------------------------------------------------
-----------------------"
ENDFORM
```

TEST5A IPF

this procedure called by cbedform.ipf

```
FORM TEST5A
        AT 1, 1 PUT "4.  OPERATING FACTORS"
        AT 1, 33 PUT "Unit Status"
        AT 1, 55 PUT "Oper. Factor (%)"
        AT 2, 5 PUT "-----------------"
        AT 2, 33 PUT "------------"
        AT 2, 55 PUT "-----------------"
        AT 3, 26 PUT "1."
        AT 3, 30 PUT "Normal Operation"
        AT 3, 46 PUT "   "
        AT 3, 56 PUT OPDUTY.NORMOP NUM
        AT 3, 56 GET OPDUTY.NORMOP
        AT 3, 57 PUT "                    "
        AT 5, 26 PUT "2."
        AT 5, 30 PUT "Limited Operation "
        AT 5, 56 PUT OPDUTY.DEGOP NUM
        AT 5, 56 GET OPDUTY.DEGOP
        AT 5, 57 PUT "                   "
        AT 7, 26 PUT "3."
        AT 7, 30 PUT "Shutdown Operation "
        AT 7, 56 PUT OPDUTY.SHUTOP NUM
        AT 7, 56 GET OPDUTY.SHUTOP
        AT 7, 57 PUT "                   "
        AT 10, 1 PUT "5.  DUTY FACTORS"
        AT 10, 33 PUT "Unit Status"
        AT 10, 55 PUT "Cycling Rate (Per Hr.)"
        AT 11, 5 PUT "-------------"
        AT 11, 33 PUT "------------"
        AT 11, 55 PUT "-----------------------"
        AT 12, 26 PUT "1.  Normal Operation"
        AT 12, 56 PUT OPDUTY.NORMCY NUM
        AT 12, 56 GET OPDUTY.NORMCY  NUM
        AT 14, 26 PUT "2.  Limited Operation "
        AT 14, 56 PUT OPDUTY.DEGCY NUM
        AT 14, 56 GET OPDUTY.DEGCY  NUM
        AT 16, 26 PUT "3.  Shutdown Operation"
        AT 16, 56 PUT OPDUTY.SHUTCY NUM
        AT 16, 56 GET OPDUTY.SHUTCY  NUM
ENDFORM
```

TEST6A IPF

this procedure called by cbedform.ipf

```
FORM TEST6A
        AT 1, 1 PUT "6.  MAINTENANCE AND INSPECTION/TEST DATA"
        AT 2, 5 PUT "-------------------------------------"
        AT 3, 5 PUT "(a)  Maintenance Interval and Type"
        AT 3, 41 PUT MAININSP.MAININTY STR
        AT 3, 41 GET MAININSP.MAININTY
        AT 9, 5 PUT "(b)  Inspection/Test Interval and Type"
        AT 9, 45 PUT MAININSP.INSPTIT STR
        AT 9, 45 GET MAININSP.INSPTIT
        AT 15, 1 PUT "-------------------------------------------------------------
----------------------"
ENDFORM
```

TEST7A IPF

this procedure called by cbedform.ipf

```
FORM TEST7A
        AT 1, 1 PUT "7.  RADIATION EXPOSURE"
        AT 2, 5 PUT "--------------------"
        AT 3, 5 PUT "Neutron Flux Level "
        AT 3, 26 PUT ENVIRON.NFLUX STR
        AT 3, 26 GET ENVIRON.NFLUX  STR
        AT 5, 5 PUT "Tritium Environment "
        AT 5, 27 PUT ENVIRON.TRITENV STR
        AT 5, 27 GET ENVIRON.TRITENV  STR
        AT 6, 1 PUT "-------------------------------------------------------------------------------
---------------------"
ENDFORM
```

TEST8A IPF

this procedure called by cbedform.ipf

```
FORM TEST8A
        AT 1, 1 PUT "8.  REMARKS, SPECIAL INFORMATION"
        AT 2, 5 PUT "-------------------------------"
        AT 4, 5 PUT REMARKS.REMARKS STR
        AT 4, 5 GET REMARKS.REMARKS
        AT 26, 1 PUT "-------------------------------------------------------------------------------
---------------------"
ENDFORM
```

TEST9A IPF

this procedure called by cbedform.ipf

```
FORM TEST9A
        AT 1, 1 PUT "9.  SIGNATURES"
        AT 1, 23 PUT "Last Name, Initials"
        AT 1, 48 PUT "Signature"
        AT 1, 67 PUT "Site Phone No."
        AT 2, 5 PUT "----------"
        AT 2, 23 PUT "--------------------"
        AT 2, 48 PUT "----------"
        AT 2, 67 PUT "---------------"
        AT 4, 5 PUT "System Designer"
        AT 4, 23 PUT "________________________"
        AT 4, 48 PUT "_________________"
        AT 4, 67 PUT "_______________"
        AT 6, 5 PUT "CREDO"
        AT 6, 23 PUT "________________________"
        AT 6, 48 PUT "_________________"
        AT 6, 67 PUT "_______________"
ENDFORM
```

this procedure called by cmenub1.ipf

MENUBC5 IPF

```
FORM MENUBC5
     AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 2, 1 PUT "The Base Engineering Data is arranged in 7 tables.  The tab
les and their fields"
        AT 3, 1 PUT "are:"
        AT 5, 3 PUT "SUPPFORM         COMPSPEC                       DESIGNS
   OPDUTY"
        AT 6, 3 PUT "--------         --------                       -------
   ------"
        AT 7, 3 PUT "credoid#         credoid      site              credoid
   credoid"
        AT 8, 3 PUT "compname         pps          mfg               critsys
   normop"
        AT 9, 3 PUT "suppform         manufact     datein            desfunc
   degop "
        AT 10, 3 PUT "paramid#        code         modific           applicat
    shutop"
        AT 11, 3 PUT "                specstno     removal           deslife
    normcy"
        AT 12, 3 PUT "                safeqc                         deslifec
    degcy"
        AT 13, 3 PUT "                drwgnum
    shutcy"
        AT 16, 3 PUT "MAININSP        ENVIRON          REMARKS"
        AT 17, 3 PUT "--------        -------          -------"
        AT 18, 3 PUT "credoid         credoid          credoid"
        AT 19, 3 PUT "maininty        nflux            remarks"
        AT 20, 3 PUT "insptit         tritenv  "
        AT 23, 3 PUT "PRESS RETURN TO GO BACK TO PREVIOUS MENU"
ENDFORM
```

```
The Base Engineering Data is arranged in 7 tables.  The tables and their fields
are:

  SUPPFORM        COMPSPEC                       DESIGNS         OPDUTY
  --------        --------                       -------         ------
  credoid#        credoid      site              credoid         credoid
  compname        pps          mfg               critsys         normop
  suppform        manufact     datein            desfunc         degop
  paramid#        code         modific           applicat        shutop
                  specstno     removal           deslife         normcy
                  safeqc                         deslifec        degcy
                  drwgnum                                        shutcy

  MAININSP        ENVIRON          REMARKS
  --------        -------          -------
  credoid         credoid          credoid
  maininty        nflux            remarks
  insptit         tritenv

  PRESS RETURN TO GO BACK TO PREVIOUS MENU
```

this procedure called by cmenub1.ipf

CMENUBC6 IPF

```
/* file name:  cmenubc6.ipf */

/* This is the program to list data from more than one record */
/* using the base engineering data */

/* Put all tables in use */

let e.serr = true
finish all
let e.serr = false
use "b:suppform.itb"
use "b:compspec.itb"
use "b:designs.itb"
use "b:opduty.itb"
use "b:maininsp.itb"
use "b:environ.itb"
use "b:remarks.itb"
let e.lstr = 80
let e.paus = true
let e.stat = false
i = 0
while i < 10 do
   clear
   perform "b:menubc6.ipf"
   putform menubc6
   j = 0
   while j < 11 do
      info = ""
      let e.lstr = 155
      at 15,6 input info
      let e.lstr = 80
      test info
         case "": return
         case "0": perform "b:helpscrn.ipf"; clear; putform menubc6; break
         otherwise: j = 99; break
      endtest
   endwhile
   k = 0
   while k < 10 do
      prtout = "n"
      at 24,55 input prtout using "r"
      test prtout
         case "n": k = 99; list ^info; break
         case "y": k = 99; let e.oprn = true; list ^info; let e.oprn = false; br
eak
         otherwise: at 25,6 output "This is not a valid option, please reenter t
he option."; break
      endtest
   endwhile
   i = 99
   finish all
endwhile
let e.lstr = 15
let e.paus = false
let e.stat = true
return
```

this procedure called by cmenubc6.ipf

MENUBC6 IPF

```
FORM MENUBC6
     AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 1, 19 PUT "LISTING OUT DATA FOR MORE THAN ONE RECORD"
        AT 2, 19 PUT "----------------------------------------"
        AT 4, 3 PUT "This option allows you to create very simple listings eithe
r on the screen or"
        AT 5, 3 PUT "output to the printer.  For more sophisticated report gener
ation, refer to "
        AT 6, 3 PUT "the KMan \"select\" command or the KReport report generator
."
        AT 8, 6 PUT "Enter information in the following manner for a listing:"
        AT 10, 11 PUT "LIST [fieldname] FROM [tablename] { FOR [condition] }"
        AT 12, 6 PUT "Enter the information here or press return to go back to p
revious menu:"
        AT 13, 6 PUT "(or \"0\" for further information)"
        AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 15, 1 PUT "list"
        AT 17, 3 PUT "Examples:  list COMPNAME, PARAMID# from SUPPFORM"
        AT 19, 14 PUT "list COMPNAME, PARAMID# from SUPPFORM for CREDOID# in [\"
VA-*\"]"
        AT 21, 14 PUT "list COMPNAME, PARAMID#, COMPSPEC.CODE from SUPPFORM for
CREDOID#"
        AT 22, 14 PUT "in [\"VA-*\"], from COMPSPEC for COMPSPEC.CREDOID EQ CRED
OID# "
        AT 24, 3 PUT "Do you want this output to the printer? (y or n)"
ENDFORM
```

```
                    LISTING OUT DATA FOR MORE THAN ONE RECORD
                    -----------------------------------------

  This option allows you to create very simple listings either on the screen or
  output to the printer.  For more sophisticated report generation, refer to
  the KMan "select" command or the KReport report generator.

     Enter information in the following manner for a listing:

          LIST [fieldname] FROM [tablename] { FOR [condition] }

     Enter the information here or press return to go back to previous menu:
     (or "0" for further information)

list ____________________________________________________________________________
-------------------------------------------------------------------------------
  Examples:  list COMPNAME, PARAMID# from SUPPFORM

             list COMPNAME, PARAMID# from SUPPFORM for CREDOID# in ["VA-*"]

             list COMPNAME, PARAMID#, COMPSPEC.CODE from SUPPFORM for CREDOID#
             in ["VA-*"], from COMPSPEC for COMPSPEC.CREDOID EQ CREDOID#

  Do you want this output to the printer? (y or n)
```

this procedure called by credo.ipf

CMENUB2 IPF

```
FORM CMENUB2
     AT 1, 1 TO 24, 80 PUT "FWBU"
        AT 3, 3 PUT "This option is not available.  A full menu structure has be
en developed for"
        AT 4, 3 PUT "the Base Engineering Data only.  A similar menu structure c
an be developed"
        AT 5, 3 PUT "for the remaining 3 types of data using the Base Engineerin
g Data structure"
        AT 6, 3 PUT "as a template.  Refer to the appendices of UWFDM-653 for ot
her procedures"
        AT 7, 3 PUT "and forms available to work with the other types of data."

        AT 21, 3 PUT "PRESS RETURN TO GO BACK TO PREVIOUS MENU"
ENDFORM
```

```
This option is not available.  A full menu structure has been developed for
the Base Engineering Data only.  A similar menu structure can be developed
for the remaining 3 types of data using the Base Engineering Data structure
as a template.  Refer to the appendices of UWFDM-653 for other procedures
and forms available to work with the other types of data.




PRESS RETURN TO GO BACK TO PREVIOUS MENU
```

Appendix E: Programs

2. Programs for Inputting Supplemental Engineering Data (print out using "print screen")

HEAT IPF

this procedure is used to create records for the CREDO Supplemental Data Form for Electric Heaters

```
LET E.LSTR = 80
LET E.DECI = 0
LET E.LNUM = 2
USE "B:EHEATER.ITB"
CLEAR
LOAD PERFORM "B:AHEATER.IPF"
PERFORM "B:AHEATER.IPF"
PUTFORM EHEATER1
LET OPNUM = 0
AT 20, 36 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE TWORD IN EHEATER TO "INDUCT" ;ENDIF
IF OPNUM = 2 THEN CHANGE TWORD IN EHEATER TO "RADIANT" ;ENDIF
IF OPNUM = 3 THEN CHANGE TWORD IN EHEATER TO "RESIST";ENDIF
IF OPNUM = 4 THEN CHANGE TWORD IN EHEATER TO "OTHER";ENDIF
AT 18, 11 OUTPUT EHEATER.TWORD
PUTFORM EHEATER2
LET OPNUM=0
AT 20, 36 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE FWORD IN EHEATER TO "IMMERS";ENDIF
IF OPNUM = 2 THEN CHANGE FWORD IN EHEATER TO "SPACE";ENDIF
IF OPNUM = 3 THEN CHANGE FWORD IN EHEATER TO "TRACE";ENDIF
AT 17, 30 OUTPUT EHEATER.FWORD
PUTFORM EHEATER3
LET OPNUM = 0
AT 20, 36 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE HWORD IN EHEATER TO "CALROD";ENDIF
IF OPNUM = 2 THEN CHANGE HWORD IN EHEATER TO "INDCOIL";ENDIF
IF OPNUM = 3 THEN CHANGE HWORD IN EHEATER TO "RADPAN";ENDIF
IF OPNUM = 4 THEN CHANGE HWORD IN EHEATER TO "RESWIRE";ENDIF
IF OPNUM = 5 THEN CHANGE HWORD IN EHEATER TO "OTHER";ENDIF
AT 19, 52 OUTPUT EHEATER.HWORD;AT 22,45 OUTPUT "HIT RETURN TO CONTINUE";WAIT
clear
PUTFORM EHEATER4
LET OPNUM = 0
AT 25, 15 OUTPUT "ENTER OPTION NUMBER:"
AT 24,36 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE HAWORD IN EHEATER TO "BUILDING";ENDIF
IF OPNUM = 2 THEN CHANGE HAWORD IN EHEATER TO "COLDTRAP";ENDIF
IF OPNUM = 3 THEN CHANGE HAWORD IN EHEATER TO "ENGINE";ENDIF
IF OPNUM = 4 THEN CHANGE HAWORD IN EHEATER TO "EVAPOR";ENDIF
IF OPNUM = 5 THEN CHANGE HAWORD IN EHEATER TO "FUELPROS";ENDIF
IF OPNUM = 6 THEN CHANGE HAWORD IN EHEATER TO "HX";ENDIF
IF OPNUM = 7 THEN CHANGE HAWORD IN EHEATER TO "INSTRUM";ENDIF
IF OPNUM = 8 THEN CHANGE HAWORD IN EHEATER TO "PIPE";ENDIF
IF OPNUM = 9 THEN CHANGE HAWORD IN EHEATER TO "PMETER";ENDIF
IF OPNUM = 10 THEN CHANGE HAWORD IN EHEATER TO "PIMON";ENDIF
IF OPNUM = 11 THEN CHANGE HAWORD IN EHEATER TO "PMEDIA";ENDIF
IF OPNUM = 12 THEN CHANGE HAWORD IN EHEATER TO "PUMP";ENDIF
IF OPNUM = 13 THEN CHANGE HAWORD IN EHEATER TO "R";ENDIF
IF OPNUM = 14 THEN CHANGE HAWORD IN EHEATER TO "SG";ENDIF
IF OPNUM = 15 THEN CHANGE HAWORD IN EHEATER TO "SH";ENDIF
IF OPNUM = 16 THEN CHANGE HAWORD IN EHEATER TO "TANKDRUM";ENDIF
IF OPNUM = 17 THEN CHANGE HAWORD IN EHEATER TO "VALVE";ENDIF
IF OPNUM = 18 THEN CHANGE HAWORD IN EHEATER TO "OTHER";ENDIF
AT 22,11 OUTPUT EHEATER.HAWORD
PUTFORM EHEATER5
LET OPNUM = 0
AT 24,36 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE HDWORD IN EHEATER TO "CONTACT";ENDIF
IF OPNUM = 2 THEN CHANGE HDWORD IN EHEATER TO "CONVECT";ENDIF
IF OPNUM = 3 THEN CHANGE HDWORD IN EHEATER TO "FDRAFT";ENDIF
IF OPNUM = 4 THEN CHANGE HDWORD IN EHEATER TO "RADIANT";ENDIF
IF OPNUM = 5 THEN CHANGE HDWORD IN EHEATER TO "OTHER";ENDIF
AT 12, 57 OUTPUT EHEATER.HDWORD
PUTFORM EHEATER6
LET OPNUM = 0
AT 24, 36 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE CWORD IN EHEATER TO "AUTOSENS";ENDIF
IF OPNUM = 2 THEN CHANGE CWORD IN EHEATER TO "MANUAL";ENDIF
AT 20, 56 OUTPUT EHEATER.CWORD;AT 22,45 OUTPUT "HIT RETURN TO CONTINUE";WAIT
CLEAR
PUTFORM EHEATER7
LET OPNUM = 0
AT 20,15 OUTPUT "ENTER OPTION NUMBER:"
AT 20, 36 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE PWORD IN EHEATER TO "AC";ENDIF
IF OPNUM = 2 THEN CHANGE PWORD IN EHEATER TO "DC";ENDIF
AT 14, 18 OUTPUT EHEATER.PWORD
PUTFORM EHEATER8
OPNUM = 0
AT 20,36 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE DWORD IN EHEATER TO "CONTIN";ENDIF
IF OPNUM = 2 THEN CHANGE DWORD IN EHEATER TO "CYCLIC";ENDIF
AT 14, 46 OUTPUT EHEATER.DWORD;AT 22,45 OUTPUT "HIT RETURN TO CONTINUE";WAIT
CLEAR
eject
AT 2, 60 OUTPUT "page 2 of 2"
AT 5, 20 OUTPUT "ELECTRIC HEATERS (EHEATER)"
AT 6, 20 OUTPUT "--------------------------"
AT 9, 36 OUTPUT "Value"
AT 10, 36 OUTPUT "-----"
AT 9, 50 OUTPUT "Units"
AT 10, 50 OUTPUT "-----"
AT 9, 10 OUTPUT "Design Parameters"
AT 10, 10 OUTPUT "------------------"
AT 12, 5 OUTPUT "1. Capacity Power Rating"
AT 13, 5 OUTPUT "2. Design Current"
AT 14, 5 OUTPUT "3. Design Frequency"
AT 15, 5 OUTPUT "4. Design Resistance"
AT 16, 5 OUTPUT "5. Design Voltage"
AT 17, 5 OUTPUT "6. Maximum Design Temperature"
AT 18, 5 OUTPUT "7. Wiresize"
AT 12, 50 OUTPUT "KW"
AT 13, 50 OUTPUT "AMP"
AT 14, 50 OUTPUT "HZ"
AT 15, 50 OUTPUT "OHM"
AT 16, 50 OUTPUT "VOLTS"
AT 17, 50 OUTPUT "DEGF"
AT 18, 50 OUTPUT "AWG"
```

```
LET E.DECI = 2
LET E.LNUM = 6
LET HEN = 0
AT 12, 36 INPUT HEN; CHANGE CPRATE IN EHEATER TO HEN
DEB = 0
AT 13, 36 INPUT DEB; CHANGE DCURRENT IN EHEATER TO DEB
TIM = 0
AT 14, 36 INPUT TIM; CHANGE DESFREQ IN EHEATER TO TIM
JOHN = 0
AT 15, 36 INPUT JOHN; CHANGE DESRES IN EHEATER TO JOHN
SON = 0
AT 16, 36 INPUT SON; CHANGE DESVOLT IN EHEATER TO SON
GREEN = 0
AT 17, 36 INPUT GREEN; CHANGE MAXDTEMP IN EHEATER TO GREEN
HARRY = 0
AT 18, 36 INPUT HARRY; CHANGE WIRESIZE IN EHEATER TO HARRY
CONVERT TWORD,FWORD,HWORD,HAWORD,HDWORD,CWORD,PWORD,DWORD,CPRATE,DCURRENT,DESFRE
Q,DESRES,DESVOLT,MAXDTEMP,WIRESIZE FROM EHEATER TO "B:EMILE.TXT"
USE "B:EHEAT.ITB"
ATTACH "B:EMILE.TXT" TO EHEAT
RUN "ERASE B:EMILE.TXT"
LET OPNUM = 0
LET E.DECI = 5
LET E.LSTR = 15
LET E.LNUM = 14
FINISH ALL
RETURN
```

AHEATER IPF

this procedure called by heat.ipf

```
FORM EHEATER1
        AT 2, 60 PUT "page 1 of 2"
        AT 5, 20 PUT "CREDO ENGINEERING DATA SUPPLEMENT"
        AT 7, 24 PUT "ELECTRIC HEATERS (EHEATER)"
        AT 8, 24 PUT "--------------------------"
        AT 10, 5 PUT "TYPE"
        AT 11, 5 PUT "----"
        AT 13, 3 PUT "1. Induction"
        AT 14, 3 PUT "2. Radiant"
        AT 15, 3 PUT "3. Resistance"
        AT 16, 3 PUT "4. Other"
        AT 18, 3 PUT "Keyword"
        AT 20, 15 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM EHEATER2
        AT 10, 24 PUT "FUNCTION"
        AT 11, 24 PUT "--------"
        AT 13, 22 PUT "1. Immersion"
        AT 14, 22 PUT "2. Space Heating"
        AT 15, 22 PUT "3. Trace Heating "
        AT 17, 22 PUT "Keyword"
ENDFORM
FORM EHEATER3
        AT 10, 46 PUT "HEATER FORM"
        AT 11, 46 PUT "-----------"
        AT 13, 44 PUT "1. Calrod Unit"
        AT 14, 44 PUT "2. Inductive Work Coil"
        AT 15, 44 PUT "3. Radiative Panel"
        AT 16, 44 PUT "4. Resistance Wire"
        AT 17, 44 PUT "5. Other"
        AT 19, 44 PUT "Keyword"
ENDFORM
FORM EHEATER4
        AT 3, 5 PUT "HEATER APPLICATION"
        AT 4, 5 PUT "------------------"
        AT 5, 3 PUT "1. Building"
        AT 6, 3 PUT "2. Cold Trap"
        AT 7, 3 PUT "3. Engine"
        AT 8, 3 PUT "4. Evaporator"
        AT 9, 3 PUT "5. Fuel Processing"
        AT 10, 3 PUT "6. Heat Exchanger"
        AT 11, 3 PUT "7. Instrumentation"
        AT 12, 3 PUT "8. Pipe"
        AT 13, 3 PUT "9. Plugging Meter"
```

FILT IPF

this procedure is used to create records for the CREDO Supplemental Data Form for Filters/Strainers

```
LET E.LSTR = 80
LET E.DECI = 0
CLEAR
LET E.LNUM = 2
USE "B:FILTER.ITB"
LOAD PERFORM "B:FILTERS.IPF"
PERFORM "B:FILTERS.IPF"
PUTFORM FILTER1
        TWORD = ""
        OPTNUM = 0
@ 23, 35 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE TWORD IN FILTER TO "Centrifu";ENDIF
IF OPTNUM = 2 THEN CHANGE TWORD IN FILTER TO "Chemical";ENDIF
IF OPTNUM = 3 THEN CHANGE TWORD IN FILTER TO "EM";ENDIF
IF OPTNUM = 4 THEN CHANGE TWORD IN FILTER TO "Mech";ENDIF
IF OPTNUM = 5 THEN CHANGE TWORD IN FILTER TO "Membrane";ENDIF
IF OPTNUM = 6 THEN CHANGE TWORD IN FILTER TO "Settling";ENDIF
   @ 21, 13 OUTPUT TWORD
PUTFORM FILTER2
MEDPRO = ""
OPTNUM = 0
AT 23,35 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE MEDPRO IN FILTER TO "GAS";ENDIF
IF OPTNUM = 2 THEN CHANGE MEDPRO IN FILTER TO "LIQUID";ENDIF
IF OPTNUM = 3 THEN CHANGE MEDPRO IN FILTER TO "LIQNA";ENDIF
IF OPTNUM = 4 THEN CHANGE MEDPRO IN FILTER TO "LIQNAK";ENDIF
IF OPTNUM = 5 THEN CHANGE MEDPRO IN FILTER TO "SOLID";ENDIF
AT 19, 36 OUTPUT FILTER.MEDPRO
PUTFORM FILTER3
FILMECH = "";OPTNUM = 0
AT 23, 35 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE FILMECH IN FILTER TO "CENTRIFU";ENDIF
IF OPTNUM = 2 THEN CHANGE FILMECH IN FILTER TO "EM";ENDIF
IF OPTNUM = 3 THEN CHANGE FILMECH IN FILTER TO "ES";ENDIF
IF OPTNUM = 4 THEN CHANGE FILMECH IN FILTER TO "FLOW";ENDIF
IF OPTNUM = 5 THEN CHANGE FILMECH IN FILTER TO "SEDIMENT";ENDIF
IF OPTNUM = 6 THEN CHANGE FILMECH IN FILTER TO "VIBRATN";ENDIF
AT 20, 65 OUTPUT FILTER.FILMECH
AT 24,30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
CLEAR;PUTFORM FILTER4
DRIVMECH = "";OPTNUM= 0
AT 20, 50 INPUT OPTNUM
IF OPTNUM= 1 THEN CHANGE DRIVMECH IN FILTER TO "CHEMPPT";ENDIF
IF OPTNUM= 2 THEN CHANGE DRIVMECH IN FILTER TO "ELECTRIC";ENDIF
IF OPTNUM= 3 THEN CHANGE DRIVMECH IN FILTER TO "GRAVITY";ENDIF
IF OPTNUM= 4 THEN CHANGE DRIVMECH IN FILTER TO "MAGNETIC";ENDIF
IF OPTNUM= 5 THEN CHANGE DRIVMECH IN FILTER TO "PRESSURE";ENDIF
IF OPTNUM= 6 THEN CHANGE DRIVMECH IN FILTER TO "TEMP";ENDIF
IF OPTNUM= 7 THEN CHANGE DRIVMECH IN FILTER TO "VELOCITY";ENDIF
AT 18, 12 OUTPUT FILTER.DRIVMECH
PUTFORM FILTER5
CRWORD = "";AT 12, 38 INPUT CRWORD using "rrrrrrrr";CHANGE FILMAT IN FILTER TO C
RWORD
PUTFORM FILTER6
CWORD = ""; AT 12, 62 INPUT CWORD using "rrrrrrrr"; CHANGE BODYMAT IN FILTER TO
CWORD
AT 23,33 OUTPUT "PRESS RETURN TO CONTINUE"
WAIT;CLEAR
e.lnum = 6
e.deci = 2
AT 3, 3 OUTPUT "DESIGNS PARAMETERS"
AT 4, 5 OUTPUT "--------------------"
AT 3, 40  OUTPUT "VALUE"
AT 4, 40  OUTPUT "-----"
AT 3, 55  OUTPUT "UNITS"
AT 4, 55  OUTPUT "-----"
AT 6, 5 OUTPUT "1. Design Gas Flow Rate"
AT 7, 5 OUTPUT "2. Design Liquid Flow Rate"
AT 8, 5 OUTPUT "3. Design Pressure"
AT 9, 5 OUTPUT "4. Design Temperature"
AT 10, 5 OUTPUT "5. Filter or Mesh Size"
AT 11, 5 OUTPUT "6. Filtration Capacity"
AT 12, 5 OUTPUT "7. Inlet Size"
AT 13, 5 OUTPUT "8. Nominal Operating Pressure"
AT 14, 5 OUTPUT "9. Nominal Operating Temp."
AT 15, 4 OUTPUT "10. Nominal Pressure Drop"
AT 16, 4 OUTPUT "11. Outlet Size"
AT 6, 55 OUTPUT "FT3/MIN"
AT 7, 55 OUTPUT "GPM"
AT 8, 55 OUTPUT "PSIG"
AT 9, 55 OUTPUT "DEGF"
AT 10, 55 OUTPUT "MICR"
AT 11, 55 OUTPUT "FT3/MIN"
AT 12, 55 OUTPUT "IN"
AT 13, 55 OUTPUT "PSIG"
AT 14, 55 OUTPUT "DEGF"
AT 15, 55 OUTPUT "PSID"
AT 16, 55 OUTPUT "IN"
DGFR = 0; AT 6, 40 INPUT DGFR; CHANGE DESGASFR IN FILTER TO DGFR
DLFR = 0; AT 7, 40 INPUT DLFR; CHANGE DESLIQFR IN FILTER TO DLFR
DP = 0; AT 8, 40 INPUT DP; CHANGE DESPRESS IN FILTER TO DP
DT = 0; AT 9, 40 INPUT DT; CHANGE DESTEMP IN FILTER TO DT
FMS = 0; AT 10, 40 INPUT FMS; CHANGE FILMESH IN FILTER TO FMS
FC = 0; AT 11, 40 INPUT FC; CHANGE FILCAP IN FILTER TO FC
IST = 0; AT 12, 40 INPUT IST; CHANGE INLET IN FILTER TO IST
NOP = 0; AT 13, 40 INPUT NOP; CHANGE NOOPPRES IN FILTER TO NOP
NOTP = 0; AT 14, 40 INPUT NOTP; CHANGE NOOPTEMP IN FILTER TO NOTP
NPD = 0; AT 15, 40 INPUT NPD; CHANGE NOPRESDR IN FILTER TO NPD
OS = 0; AT 16, 40 INPUT OS; CHANGE OUTLET IN FILTER TO OS
CONVERT TWORD,MEDPRO,FILMECH,DRIVMECH,FILMAT,BODYMAT,DESGASFR,DESLIQFR,DESPRESS,
DESTEMP,FILMESH,FILCAP,INLET,NOOPPRES,NOOPTEMP,NOPRESDR,OUTLET FROM FILTER TO "B
:FILTH.TXT"
USE "B:FILSTR.ITB"
ATTACH "B:FILTH.TXT" TO FILSTR
RUN "ERASE B:FILTH.TXT"
OPTNUM = 0
E.DECI = 5
E.LSTR = 15
E.LNUM = 14
FINISH ALL
RETURN
```

FILTERS IPF

* this procedure called by filt.ipf

```
FORM FILTER1
        @ 3, 20 PUT "CREDO ENGINEERING DATA SUPPLEMENT"
        @ 4, 20 PUT "-------------------------------------"
        @ 6, 22 PUT "FILTERS/STRAINERS (FILTER)"
        @ 7, 22 PUT "--------------------------"
        @ 10, 10 PUT "TYPE"
        @ 11, 10 PUT "----"
        @ 13, 5 PUT "1. Centrifugal"
        @ 14, 5 PUT "2. Chemical"
        @ 15, 5 PUT "3. Electromagnetic"
        @ 16, 5 PUT "4. Mechanical"
        @ 17, 5 PUT "5. Membrane"
        @ 18, 5 PUT "6. Settling"
        @ 19, 5 PUT "7. Other"
        @ 21, 5 PUT "Keyword"
        @ 23, 15 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM FILTER2
        @ 10, 30 PUT "MEDIUM PROCESSED"
        @ 11, 30 PUT "----------------"
        @ 13, 28 PUT "1. Gas"
        @ 14, 28 PUT "2. Liquid"
        @ 15, 28 PUT "3. Liquid Sodium"
        @ 16, 28 PUT "4. Liquid Sodium/Potassium"
        @ 17, 28 PUT "5. Solid"
        @ 19, 28 PUT "Keyword"
ENDFORM
FORM FILTER3
        @ 10, 59 PUT "FILTER MECHANISM"
        @ 11, 59 PUT "----------------"
        @ 13, 57 PUT "1. Centrifugal"
        @ 14, 57 PUT "2. Electromagnetic"
        @ 15, 57 PUT "3. Electrostatic"
        @ 16, 57 PUT "4. Flow"
        @ 17, 57 PUT "5. Sedimentation"
        @ 18, 57 PUT "6. Vibration"
        @ 20, 57 PUT "Keyword"
ENDFORM
FORM FILTER4
        @ 7, 5 PUT "DRIVER MECHANISM"
        @ 8, 5 PUT "----------------"
        @ 10, 3 PUT "1. Chemical Precipitation"
        @ 11, 3 PUT "2. Electric"
        @ 12, 3 PUT "3. Gravitational"
        @ 13, 3 PUT "4. Magnetic"
        @ 14, 3 PUT "5. Pressure"
        @ 15, 3 PUT "6. Temperature"
        @ 16, 3 PUT "7. Velocity"
        @ 18, 3 PUT "Keyword"
        @ 20, 30 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM FILTER5
        @ 7, 33 PUT "FILTER MATERIAL"
        @ 8, 33 PUT "---------------"
        @ 10, 33 PUT "Input CREDO Keyword"
ENDFORM
FORM FILTER6
        @ 7, 58 PUT "BODY MATERIAL"
        @ 8, 58 PUT "-------------"
        @ 10, 58 PUT "Input CREDO Keyword"
ENDFORM
```

GASDRY IPF

this procedure is used to create records for the CREDO Supplemental Data Form for Gas Dryers

```
E.LSTR = 80
E.DECI = 0
E.LNUM = 2
USE "B:GAS.ITB"
CLEAR
LOAD PERFORM "B:GASDRYER.IPF"
PERFORM "B:GASDRYER.IPF"
PUTFORM DRYER1
OPTNUM = 0
AT 24, 41 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE TWORD IN GAS TO "CENTRIFU";ENDIF
IF OPTNUM = 2 THEN CHANGE TWORD IN GAS TO "CHEMABS";ENDIF
IF OPTNUM = 3 THEN CHANGE TWORD IN GAS TO "CHEMADS";ENDIF
IF OPTNUM = 4 THEN CHANGE TWORD IN GAS TO "CONDBAF";ENDIF
IF OPTNUM = 5 THEN CHANGE TWORD IN GAS TO "HEATED";ENDIF
IF OPTNUM = 6 THEN CHANGE TWORD IN GAS TO "HCTRAP";ENDIF
IF OPTNUM = 7 THEN CHANGE TWORD IN GAS TO "OTHER";ENDIF
AT 21, 11 OUTPUT GAS.TWORD
PUTFORM DRYER2
OPTNUM = 0
AT 24, 41 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE MEDPRO IN GAS TO "AIR";ENDIF
IF OPTNUM = 2 THEN CHANGE MEDPRO IN GAS TO "ARGON";ENDIF
IF OPTNUM = 3 THEN CHANGE MEDPRO IN GAS TO "HE";ENDIF
IF OPTNUM = 4 THEN CHANGE MEDPRO IN GAS TO "HCARBON";ENDIF
IF OPTNUM = 5 THEN CHANGE MEDPRO IN GAS TO "H2";ENDIF
IF OPTNUM = 6 THEN CHANGE MEDPRO IN GAS TO "N2";ENDIF
IF OPTNUM = 7 THEN CHANGE MEDPRO IN GAS TO "O2";ENDIF
IF OPTNUM = 8 THEN CHANGE MEDPRO IN GAS TO "OTHER";ENDIF
AT 22, 57 OUTPUT GAS.MEDPRO
AT 25, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
CLEAR
AT 5, 5 OUTPUT "DESIGN PARAMETERS"
AT 6, 5 OUTPUT "-----------------"
AT 8, 5 OUTPUT "1. Cycle Time"
AT 9, 5 OUTPUT "2. Design Capacity Flow"
AT 10, 5 OUTPUT "3. Design Pressure"
AT 11, 5 OUTPUT "4. Design Temperature"
AT 12, 5 OUTPUT "5. Nominal Operating Pressure"
AT 13, 5 OUTPUT "6. Nominal Operating Temp."
AT 14, 5 OUTPUT "7. Outlet Dew-Point Temp."
AT 5, 65 OUTPUT "UNITS"
AT 6, 65 OUTPUT "-----"
AT 8, 65 OUTPUT "MIN"
AT 9, 65 OUTPUT "FT3/MIN"
AT 10, 65 OUTPUT "PSIG"
AT 11, 65 OUTPUT "DEGF"
AT 12, 65 OUTPUT "PSIG"
AT 13, 65 OUTPUT "DEGF"
AT 14, 65 OUTPUT "DEGF"
AT 5, 45 OUTPUT "VALUE"
AT 6, 45 OUTPUT "-----"
e.lnum = 6;e.deci = 2
ctime=0; at 8, 45 INPUT CTIME; CHANGE CYCTIME IN GAS TO CTIME
DECAFL=0; AT 9, 45 INPUT DECAFL; CHANGE DESCAP IN GAS TO DECAFL
DEPR=0; AT 10, 45 INPUT DEPR; CHANGE DESPRESS IN GAS TO DEPR
DETE=0; AT 11, 45 INPUT DETE; CHANGE DESTEMP IN GAS TO DETE
NOP=0; AT 12, 45 INPUT NOP; CHANGE NOOPRESS IN GAS TO NOP
NOTR=0; AT 13, 45 INPUT NOTR; CHANGE NOOPTEMP IN GAS TO NOTR
OUTDEW=0; AT 14, 45 INPUT OUTDEW; CHANGE OUTLET IN GAS TO OUTDEW
CONVERT TWORD, MEDPRO, DESCAP, CYCTIME, DESPRESS, DESTEMP, NOOPRESS, NOOPTEMP, O
UTLET, FROM GAS TO "B:SUMME.TXT"
USE "B:GASDRY.ITB"
ATTACH "B:SUMME.TXT" TO GASDRY
RUN "ERASE B:SUMME.TXT"
OPTNUM = 0; E.DECI = 5
E.LSTR = 15; E.LNUM = 14
FINISH ALL; RETURN
```

this procedure called by gasdry.ipf

GASDRYER IPF

```
FORM DRYER1
        @ 5, 20 PUT "CREDO ENGINEERING DATA SUPPLEMENT"
        @ 7, 26 PUT "GAS DRYER (GASDRYER)"
        @ 8, 26 PUT "--------------------"
        @ 10, 5 PUT "TYPE"
        @ 11, 5 PUT "----"
        @ 13, 3 PUT "1. Centrifugal"
        @ 14, 3 PUT "2. Chemical Absorption"
        @ 15, 3 PUT "3. Chemical Adsorption"
        @ 16, 3 PUT "4. Condensate Baffled"
        @ 17, 3 PUT "5. Heated"
        @ 18, 3 PUT "6. Heated & Condensate Trapped"
        @ 19, 3 PUT "7. Other"
        @ 21, 3 PUT "Keyword"
        @ 24, 20 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM DRYER2
        @ 10, 50 PUT "MEDIUM PROCESSED"
        @ 11, 50 PUT "----------------"
        @ 13, 48 PUT "1. Air"
        @ 14, 48 PUT "2. Argon"
        @ 15, 48 PUT "3. Helium"
        @ 16, 48 PUT "4. Hydrocarbons"
        @ 17, 48 PUT "5. Hydrogen"
        @ 18, 48 PUT "6. Nitrogen"
        @ 19, 48 PUT "7. Oxygen"
        @ 20, 48 PUT "8. Other"
        @ 22, 48 PUT "Keyword"
ENDFORM
```

GASMO IPF

this procedure is used to create records for the CREDO Supplemental Data Form for Gas Movers

```
E.LSTR = 80
E.DECI = 0
E.LNUM = 2
USE "B:GASM.ITB"
LOAD PERFORM "B:GASMOVE.IPF"
CLEAR
PERFORM "B:GASMOVE.IPF"
PUTFORM MOVER1
OPNUM = 0
AT 24, 27 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE TYWORD IN GASM TO "CIRCULTR";ENDIF
IF OPNUM = 2 THEN CHANGE TYWORD IN GASM TO "COMPRESS";ENDIF
IF OPNUM = 3 THEN CHANGE TYWORD IN GASM TO "BLOWER";ENDIF
IF OPNUM = 4 THEN CHANGE TYWORD IN GASM TO "VACPUMP"; ENDIF
IF OPNUM = 5 THEN CHANGE TYWORD IN GASM TO "VENTLATR"; ENDIF
IF OPNUM = 6 THEN CHANGE TYWORD IN GASM TO "OTHER"; ENDIF
AT 20,13 OUTPUT GASM.TYWORD
OPNUM = 0
PUTFORM MOVER2
AT 24,27 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE DTWORD IN GASM TO "AXIAL";ENDIF
IF OPNUM = 2 THEN CHANGE DTWORD IN GASM TO "CENTRIFU";ENDIF
IF OPNUM = 3 THEN CHANGE DTWORD IN GASM TO "CRYOPUMP";ENDIF
IF OPNUM = 4 THEN CHANGE DTWORD IN GASM TO "DIFFUS";ENDIF
IF OPNUM = 5 THEN CHANGE DTWORD IN GASM TO "ION";ENDIF
IF OPNUM = 6 THEN CHANGE DTWORD IN GASM TO "POSDISP";ENDIF
IF OPNUM = 7 THEN CHANGE DTWORD IN GASM TO "RADIAL";ENDIF
IF OPNUM = 8 THEN CHANGE DTWORD IN GASM TO "ROTARY";ENDIF
IF OPNUM = 9 THEN CHANGE DTWORD IN GASM TO "SORPTION";ENDIF
IF OPNUM = 10 THEN CHANGE DTWORD IN GASM TO "OTHER";ENDIF
AT 24, 43 OUTPUT GASM.DTWORD
PUTFORM MOVER3
OPNUM = 0
AT 24,27 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE DWORD IN GASM TO "ACMOTOR";ENDIF
IF OPNUM = 2 THEN CHANGE DWORD IN GASM TO "DCMOTOR";ENDIF
IF OPNUM = 3 THEN CHANGE DWORD IN GASM TO "ICENGINE";ENDIF
IF OPNUM = 4 THEN CHANGE DWORD IN GASM TO "TURBINE";ENDIF
IF OPNUM = 5 THEN CHANGE DWORD IN GASM TO "OTHER";ENDIF
AT 19, 73 OUTPUT GASM.DWORD
AT 24,55 OUTPUT "PRESS RETURN TO CONTINUE"; WAIT
CLEAR; PUTFORM MOVER4
OPNUM = 0
AT 7, 65 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE GTWORD IN GASM TO "AIR"; ENDIF
IF OPNUM = 2 THEN CHANGE GTWORD IN GASM TO "ARGON";ENDIF
IF OPNUM = 3 THEN CHANGE GTWORD IN GASM TO "HE"; ENDIF
IF OPNUM = 4 THEN CHANGE GTWORD IN GASM TO "HCARBON";ENDIF
IF OPNUM = 5 THEN CHANGE GTWORD IN GASM TO "H2"; ENDIF
IF OPNUM = 6 THEN CHANGE GTWORD IN GASM TO "N2"; ENDIF
IF OPNUM = 7 THEN CHANGE GTWORD IN GASM TO "O2"; ENDIF
IF OPNUM = 8 THEN CHANGE GTWORD IN GASM TO "OTHER";ENDIF
AT 14,28 OUTPUT GASM.GTWORD
PUTFORM MOVER5
E.LNUM= 6
E.DECI = 2
RON=0; AT 19, 40 INPUT RON; CHANGE DRATE IN GASM TO RUN
NIE=0; AT 20, 40 INPUT NIE; CHANGE FRATE IN GASM TO NIE
GAR=0; AT 21, 40 INPUT GAR; CHANGE MAXOP IN GASM TO GAR
ZAY=0; AT 22, 40 INPUT ZAY; CHANGE MAXV IN GASM TO ZAY
HEN=0; AT 23,40 INPUT HEN; CHANGE NOMOPPR IN GASM TO HEN
RY=0; AT 24, 40 INPUT RY; CHANGE ROTVEL IN GASM TO RY
CONVERT GTWORD, DWORD, DTWORD, TYWORD, NOMOPPR, ROTVEL, DRATE, FRATE,MAXOP, MAXV
 FROM GASM TO "B:DEBORAH.TXT"
USE "B:GASMOV.ITB"
ATTACH "B:DEBORAH.TXT" TO GASMOV
RUN "ERASE B:DEBORAH.TXT"
OPNUM=0; E.DECI = 5
E.LNUM=14;E.LSTR=15
FINISH ALL; RETURN
```

this procedure called by gasmo.ipf

GASMOVE IPF

```
FORM MOVER1
        AT 5, 20 PUT "CREDO ENGINEERING DATA SUPPLEMENT"
        AT 7, 26 PUT "GAS MOVERS (GASMOVER)"
        AT 8, 26 PUT "----------------------"
        AT 10, 5 PUT "TYPE"
        AT 11, 5 PUT "----"
        AT 13, 5 PUT "1. Circulator (Pump)"
        AT 14, 5 PUT "2. Compressor"
        AT 15, 5 PUT "3. Fan/Blower"
        AT 16, 5 PUT "4. Vacuum Pump"
        AT 17, 5 PUT "5. Ventilator"
        AT 18, 5 PUT "6. Other"
        AT 20, 5 PUT "Keyword"
        AT 24, 5 put "ENTER OPTION NUMBER:"
ENDFORM
FORM MOVER2
        AT 10, 35 PUT "DESIGN TYPE"
        AT 11, 35 PUT "-----------"
        AT 13, 35 PUT "1. Axial"
        AT 14, 35 PUT "2. Centrifugal"
        AT 15, 35 PUT "3. Cryopump"
        AT 16, 35 PUT "4. Diffusion"
        AT 17, 35 PUT "5. Ion"
        AT 18, 35 PUT "6. Positive Displacement"
        AT 19, 35 PUT "7. Radial"
        AT 20, 35 PUT "8. Rotary"
        AT 21, 35 PUT "9. Sorption"
        AT 22, 35 PUT "10. Other"
        AT 24, 35 PUT "Keyword"
ENDFORM
FORM MOVER3
        AT 10, 65 PUT "DRIVER"
        AT 11, 65 PUT "------"
        AT 13, 65 PUT "1. AC Motor"
        AT 14, 65 PUT "2. DC Motor"
        AT 15, 65 PUT "3. I.C. Engine"
        AT 16, 65 PUT "4. Turbine"
        AT 17, 65 PUT "5. Other"
        AT 19, 65 PUT "Keyword"
ENDFORM
FORM MOVER4
        AT 2, 20 PUT "GAS TYPE"
        AT 3, 20 PUT "--------"
        AT 5, 20 PUT "1. Air"
        AT 6, 20 PUT "2. Argon"
        AT 7, 20 PUT "3. Helium"
        AT 8, 20 PUT "4. Hydrocarbons"
        AT 9, 20 PUT "5. Hydrogen"
        AT 10, 20 PUT "6. Nitrogen"
        AT 11, 20 PUT "7. Oxygen"
        AT 12, 20 PUT "8. Other"
        AT 14, 20 PUT "Keyword"
        AT 7, 45 PUT "ENTER OPTION NUMBER:"
ENDFORM
```

```
FORM MOVER5
        AT 16, 5 PUT "DESIGN PARAMETERS"
        AT 17, 5 PUT "----------------"
        AT 19, 5 PUT "1. Driver Rating"
        AT 20, 5 PUT "2. Flow Rating"
        AT 21, 5 PUT "3. Maximum Design Pressure"
        AT 22, 5 PUT "4. Maximum Design Vacuum"
        AT 23, 5 PUT "5. Nominal Operating Press/VAC"
        AT 24, 5 PUT "6. Rotational Velocity"
        AT 16, 60 PUT "UNITS"
        AT 17, 60 PUT "-----"
        AT 19, 60 PUT "HP"
        AT 20, 60 PUT "FT3/MIN"
        AT 21, 60 PUT "PSIG"
        AT 22, 60 PUT "MMHG"
        AT 24, 60 PUT "RPM"
        AT 16, 40 PUT "VALUE"
        AT 17, 40 PUT "-----"
ENDFORM
```

ICONTROL IPF

this procedure is used to create records for the CREDO Supplemental Data Form for Instrument Controllers

```
E.LSTR = 80
E.LNUM = 2
E.DECI = 0
USE "B:INCONTLR.ITB"
CLEAR
LOAD PERFORM "B:INSCONTR.IPF"
PERFORM "B:INSCONTR.IPF"
PUTFORM CONTROL1
LET OPNUM=0
AT 24, 41 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE TWORD IN INCONTLR TO "ELECTRIC"; ENDIF
IF OPNUM = 2 THEN CHANGE TWORD IN INCONTLR TO "ETRONIC"; ENDIF
IF OPNUM = 3 THEN CHANGE TWORD IN INCONTLR TO "HYDRAUL"; ENDIF
IF OPNUM = 4 THEN CHANGE TWORD IN INCONTLR TO "MECH"; ENDIF
IF OPNUM = 5 THEN CHANGE TWORD IN INCONTLR TO "PNEUMAT"; ENDIF
IF OPNUM = 6 THEN CHANGE TWORD IN INCONTLR TO "THERMAL"; ENDIF
IF OPNUM = 7 THEN CHANGE TWORD IN INCONTLR TO "OTHER"; ENDIF
AT 21, 11 OUTPUT INCONTLR.TWORD
OPNUM = 0
PUTFORM CONTROL2
AT 24, 41 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE MCSEN IN INCONTLR TO "ELECTRIC"; ENDIF
IF OPNUM = 2 THEN CHANGE MCSEN IN INCONTLR TO "ETRONIC"; ENDIF
IF OPNUM = 3 THEN CHANGE MCSEN IN INCONTLR TO "MECH"; ENDIF
AT 17, 37 OUTPUT INCONTLR.MCSEN
OPNUM = 0
PUTFORM CONTROL3
AT 24, 41 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE CONDRIV IN INCONTLR TO "VARFQ"; ENDIF
IF OPNUM = 2 THEN CHANGE CONDRIV IN INCONTLR TO "AC"; ENDIF
IF OPNUM = 3 THEN CHANGE CONDRIV IN INCONTLR TO "DC"; ENDIF
IF OPNUM = 4 THEN CHANGE CONDRIV IN INCONTLR TO "HYDRAUL"; ENDIF
IF OPNUM = 5 THEN CHANGE CONDRIV IN INCONTLR TO "MECH"; ENDIF
IF OPNUM = 6 THEN CHANGE CONDRIV IN INCONTLR TO "PNEUMAT"; ENDIF
IF OPNUM = 7 THEN CHANGE CONDRIV IN INCONTLR TO "OTHER"; ENDIF
AT 21, 67 OUTPUT INCONTLR.CONDRIV
OPNUM = 0
AT 24, 55 OUTPUT "PRESS RETURN TO CONTINUE";WAIT;CLEAR
PUTFORM CONTROL4
AT 23, 36 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE CONPARA IN INCONTLR TO "ANGDIS"; ENDIF
IF OPNUM = 2 THEN CHANGE CONPARA IN INCONTLR TO "CAPAC"; ENDIF
IF OPNUM = 3 THEN CHANGE CONPARA IN INCONTLR TO "CURRENT"; ENDIF
IF OPNUM = 4 THEN CHANGE CONPARA IN INCONTLR TO "DEWPOINT"; ENDIF
IF OPNUM = 5 THEN CHANGE CONPARA IN INCONTLR TO "ELCFIELD"; ENDIF
IF OPNUM = 6 THEN CHANGE CONPARA IN INCONTLR TO "GASFLOW"; ENDIF
IF OPNUM = 7 THEN CHANGE CONPARA IN INCONTLR TO "LIQFLOW"; ENDIF
IF OPNUM = 8 THEN CHANGE CONPARA IN INCONTLR TO "FORCE"; ENDIF
IF OPNUM = 9 THEN CHANGE CONPARA IN INCONTLR TO "FREQ"; ENDIF
IF OPNUM = 10 THEN CHANGE CONPARA IN INCONTLR TO "INDUCT"; ENDIF
IF OPNUM = 11 THEN CHANGE CONPARA IN INCONTLR TO "LEVEL"; ENDIF
IF OPNUM = 12 THEN CHANGE CONPARA IN INCONTLR TO "LINDISP"; ENDIF
IF OPNUM = 13 THEN CHANGE CONPARA IN INCONTLR TO "MAGFIELD"; ENDIF
IF OPNUM = 14 THEN CHANGE CONPARA IN INCONTLR TO "POWER"; ENDIF
IF OPNUM = 15 THEN CHANGE CONPARA IN INCONTLR TO "PRESSURE"; ENDIF
IF OPNUM = 16 THEN CHANGE CONPARA IN INCONTLR TO "RESIST"; ENDIF
IF OPNUM = 17 THEN CHANGE CONPARA IN INCONTLR TO "ROTATION"; ENDIF
IF OPNUM = 18 THEN CHANGE CONPARA IN INCONTLR TO "TEMP"; ENDIF
IF OPNUM = 19 THEN CHANGE CONPARA IN INCONTLR TO "TORQUE"; ENDIF
IF OPNUM = 20 THEN CHANGE CONPARA IN INCONTLR TO "VACUUM"; ENDIF
IF OPNUM = 21 THEN CHANGE CONPARA IN INCONTLR TO "VOLTAGE"; ENDIF
IF OPNUM = 22 THEN CHANGE CONPARA IN INCONTLR TO "VOLUME"; ENDIF
IF OPNUM = 23 THEN CHANGE CONPARA IN INCONTLR TO "OTHER"; ENDIF
AT 20, 18 OUTPUT INCONTLR.CONPARA
OPNUM = 0
AT 24, 40 OUTPUT "PRESS RETURN TO CONTINUE";WAIT;CLEAR
PUTFORM CONTROL5
AT 8, 56 INPUT OPNUM
IF OPNUM = 1 THEN CHANGE OPFUN IN INCONTLR TO "EXPON"; ENDIF
IF OPNUM = 2 THEN CHANGE OPFUN IN INCONTLR TO "LINEAR"; ENDIF
IF OPNUM = 3 THEN CHANGE OPFUN IN INCONTLR TO "LOG"; ENDIF
IF OPNUM = 4 THEN CHANGE OPFUN IN INCONTLR TO "PROPOR"; ENDIF
IF OPNUM = 5 THEN CHANGE OPFUN IN INCONTLR TO "OTHER"; ENDIF
AT 11, 13 OUTPUT INCONTLR.OPFUN
OPNUM = 0
PUTFORM CONTROL6
E.LNUM = 6; E.DECI = 2
MDTEMP = 0; AT 16,45 INPUT MDTEMP; CHANGE MAXTEMP IN INCONTLR TO MDTEMP
MSLEV = 0; AT 17,45 INPUT MSLEV; CHANGE MASLEV IN INCONTLR TO MSLEV
TEMP = 0; AT 18, 45 INPUT TEMP; CHANGE MINTEMP IN INCONTLR TO TEMP
LEVE = 0; AT 19, 45 INPUT LEVE; CHANGE MILEV IN  INCONTLR TO LEVE
RANT = 0; AT 20, 45 INPUT RANT; CHANGE TCRANGE IN INCONTLR TO RANT
NOS = 0; AT 21, 45 INPUT NOS; CHANGE NSSLEV IN INCONTLR TO NOS
CONVERT TWORD, OPFUN, MCSEN, CONPARA, CONDRIV, MASLEV, MAXTEMP, MINTEMP, MILEV,
TCRANGE, NSSLEV FROM INCONTLR TO "B:TIMOTHY.TXT"
USE "B:CONTROL.ITB"
ATTACH "B:TIMOTHY.TXT" TO CONTROL
E.DECI = 5; E.LNUM = 14
FINISH ALL; E.LSTR = 15
RUN "ERASE B:TIMOTHY.TXT"
RETURN
```

```
USE "B:NUCD.ITB"
ATTACH "B:TEMPEST.TXT" TO NUCD
RUN ERASE "B:TEMPEST.TXT"
E.NUM = 0; E.DECI = 5; E.LNUM = 14; E.LSTR = 15
INISH ALL; RETURN
```

this procedure called by nucdet.ipf

DETE IPF

```
FORM DETECT1
        AT 2, 60 PUT "page 1 of 2"
        AT 3, 20 PUT "CREDO ENGINEERING DATA SUPPLEMENT"
        AT 5, 21 PUT "NUCLEAR DETECTORS (DETECTOR)"
        AT 6, 21 PUT "--------------------------------"
        AT 8, 2 PUT "TYPE"
        AT 9, 2 PUT "-----"
        AT 11, 2 PUT "1. Activation (Foil-Film)"
        AT 12, 2 PUT "2. Charged Particle -"
        AT 13, 2 PUT "   Solid State"
        AT 14, 2 PUT "3. Fission Chamber"
        AT 15, 2 PUT "4. Gieger-Muller"
        AT 16, 2 PUT "5. Ion Chamber"
        AT 17, 2 PUT "6. Proportional"
        AT 18, 2 PUT "7. Scintillation"
        AT 19, 2 PUT "8. Themoluminescence"
        AT 20, 2 PUT "9. Other"
        AT 22, 2 PUT "Keyword"
        AT 24, 15 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM DETECT2
        AT 8, 30 PUT "RADIATION DETECTED"
        AT 9, 30 PUT "--------------------"
        AT 11, 30 PUT "1. Alpha Particles"
        AT 12, 30 PUT "2. Beta Particles"
        AT 13, 30 PUT "3. Delayed Neutrons"
        AT 14, 30 PUT "4. Fission Particles"
        AT 15, 30 PUT "5. Gamma Rays"
        AT 16, 30 PUT "6. Nonthermal Neutrons"
        AT 17, 30 PUT "7. Photoneutrons"
        AT 18, 30 PUT "8. Thermal Neutrons"
        AT 19, 30 PUT "9. Other"
        AT 21, 30 PUT "Keyword"
ENDFORM
FORM DETECT3
        AT 8, 57 PUT "PRIMARY FUNCTION"
        AT 9, 57 PUT "-----------------"
        AT 11, 57 PUT "1. Analytical Monitoring"
        AT 12, 57 PUT "2. Environmental & "
        AT 13, 57 PUT "   Containment Control"
        AT 14, 57 PUT "3. Fuel Handling &"
        AT 15, 57 PUT "   Storage"
        AT 16, 57 PUT "4. Personnel Protection"
        AT 17, 57 PUT "5. Process Monitoring"
        AT 18, 57 PUT "6. Reactor Control"
        AT 19, 57 PUT "7. Other"
        AT 21, 57 PUT "Keyword"
ENDFORM
FORM DETECT4
        AT 3, 5 PUT "SIGNAL MODIFICATIONS"
        AT 4, 5 PUT "--------------------"
        AT 6, 5 PUT "1. Attenuated"
        AT 7, 5 PUT "2. Biased"
        AT 8, 5 PUT "3. Compensated"
        AT 9, 5 PUT "4. Converted"
```

```
        AT 10, 5 PUT "5. Delayed"
        AT 11, 5 PUT "6. Grouped"
        AT 12, 5 PUT "7. Inverted"
        AT 13, 5 PUT "8. None"
        AT 14, 5 PUT "9. Shaped"
        AT 15, 5 PUT "10. Uncompensated"
        AT 16, 5 PUT "11. Other"
        AT 18, 5 PUT "Keyword"
        AT 22, 15 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM DETECT5
        AT 3, 29 PUT "SENSITIVE ELEMENT"
        AT 4, 29 PUT "-----------------"
        AT 6, 29 PUT "1. Absorption/Emission"
        AT 7, 29 PUT "2. Fission Gas"
        AT 8, 29 PUT "3. Fission Solid"
        AT 9, 29 PUT "4. Ion Recoil Gas"
        AT 10, 29 PUT "5. Ion Recoil Solid"
        AT 11, 29 PUT "6. Liquid Scintillator"
        AT 12, 29 PUT "7. Neutron Activation"
        AT 13, 29 PUT "8. Solid Scintillator"
        AT 14, 29 PUT "9. Solid State Conductive"
        AT 15, 29 PUT "10. Other"
        AT 17, 29 PUT "Keyword"
ENDFORM
FORM DETECT6
        AT 3, 56 PUT "SIGNAL TYPE FOR ANALYSIS"
        AT 4, 56 PUT "------------------------"
        AT 6, 56 PUT "1. Current"
        AT 7, 56 PUT "2. Elemental Ratio"
        AT 8, 56 PUT "3. Film Tracks"
        AT 9, 56 PUT "4. Isotopic Ratio"
        AT 10, 56 PUT "5. Pulse"
        AT 11, 56 PUT "6. Stored Light"
        AT 12, 56 PUT "7. Voltage"
        AT 13, 56 PUT "8. Other"
        AT 15, 56 PUT "Keyword"
ENDFORM
FORM DETECT7
        AT 2, 60 PUT "page 2 of 2"
        AT 4, 5 PUT "REACTOR SCRAM OR TRIP"
        AT 5, 5 PUT "---------------------"
        AT 7, 5 PUT "1. No"
        AT 8, 5 PUT "2. Yes"
        AT 9, 5 PUT "3. Yes (Sequential Sequences)"
        AT 11, 5 PUT "Keyword"
        AT 13, 15 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM DETECT8
        AT 4, 50 PUT "FLUX MONITORING RANGE"
        AT 5, 50 PUT "---------------------"
        AT 7, 50 PUT "1. Intermediate"
        AT 8, 50 PUT "2. Power"
        AT 9, 50 PUT "3. Source"
        AT 10, 50 PUT "4. Wilde Range"
        AT 12, 50 PUT "Keyword"
ENDFORM
```

```
FORM DETECT9
        AT 15, 5 PUT "DESIGN PARAMETERS"
        AT 16, 5 PUT "-----------------"
        AT 18, 5 PUT "1. Detector Sensing Area"
        AT 19, 5 PUT "2. Detector Sensing Volume"
        AT 20, 5 PUT "3. Maximum Current"
        AT 21, 5 PUT "4. Maximum Voltage"
        AT 15, 60 PUT "UNITS"
        AT 16, 60 PUT "-----"
        AT 18, 60 PUT "CM2"
        AT 19, 60 PUT "CM3"
        AT 20, 60 PUT "AMP"
        AT 15, 40 PUT "VALUE"
        AT 16, 40 PUT "-----"
ENDFORM
```

PIPE IPF

this procedure is used to create records for the CREDO Supplemental Data Form for Pipe and Fittings

```
e.lstr = 80
e.desc = 0
e.lnum = 2
USE "B:pipef.itb"
CLEAR
LOAD PERFORM "B:pipeandf.IPF"
PERFORM "B:pipeandf.IPF"
PUTFORM pipe1
OPTNUM = 0
AT 20, 39 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE ftype IN pipef TO "ADAPTERS";ENDIF
IF OPTNUM = 2 THEN CHANGE ftype IN pipef TO "BENDS";ENDIF
IF OPTNUM = 3 THEN CHANGE ftype IN pipef TO "CONWELD";ENDIF
IF OPTNUM = 4 THEN CHANGE ftype IN pipef TO "COUPLING";ENDIF
IF OPTNUM = 5 THEN CHANGE ftype IN pipef TO "EXPJOINT";ENDIF
IF OPTNUM = 6 THEN CHANGE ftype IN pipef TO "NOZZLES";ENDIF
IF OPTNUM = 7 THEN CHANGE ftype IN pipef TO "ORIFICE";ENDIF
IF OPTNUM = 8 THEN CHANGE ftype IN pipef TO "REDUCERS";ENDIF
IF OPTNUM = 9 THEN CHANGE ftype IN pipef TO "TEES";ENDIF
IF OPTNUM = 10 THEN CHANGE ftype IN pipef TO "THERWELD";ENDIF
IF OPTNUM = 11 THEN CHANGE ftype IN pipef TO "VENTURIS";ENDIF
IF OPTNUM = 12 THEN CHANGE ftype IN pipef TO "WYES";ENDIF
IF OPTNUM = 13 THEN CHANGE ftype IN pipef TO "OTHER";ENDIF
AT 17, 11 OUTPUT pipef.ftype
PUTFORM pipe2
OPTNUM = 0
AT 20, 39 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE medpro IN pipef TO "AIR";ENDIF
IF OPTNUM = 2 THEN CHANGE medpro IN pipef TO "CHEMSOL";ENDIF
IF OPTNUM = 3 THEN CHANGE medpro IN pipef TO "FUELOIL";ENDIF
IF OPTNUM = 4 THEN CHANGE medpro IN pipef TO "GAS";ENDIF
IF OPTNUM = 5 THEN CHANGE medpro IN pipef TO "LIQGAS";ENDIF
IF OPTNUM = 6 THEN CHANGE medpro IN pipef TO "LIQNA";ENDIF
IF OPTNUM = 7 THEN CHANGE medpro IN pipef TO "LIQNAK";ENDIF
IF OPTNUM = 8 THEN CHANGE medpro IN pipef TO "STEAM";ENDIF
IF OPTNUM = 9 THEN CHANGE medpro IN pipef TO "WATER";ENDIF
IF OPTNUM = 10 THEN CHANGE medpro IN pipef TO "OTHER";ENDIF
AT 20, 60 OUTPUT pipef.medpro
AT 24, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
clear
putform pipe3
optnum = 0
at 16,24 input optnum
IF OPTNUM = 1 THEN CHANGE psched IN pipef TO "5-S";ENDIF
IF OPTNUM = 2 THEN CHANGE psched IN pipef TO "10-S";ENDIF
IF OPTNUM = 3 THEN CHANGE psched IN pipef TO "20-S";ENDIF
IF OPTNUM = 4 THEN CHANGE psched IN pipef TO "30-S";ENDIF
IF OPTNUM = 5 THEN CHANGE psched IN pipef TO "40-S";ENDIF
IF OPTNUM = 6 THEN CHANGE psched IN pipef TO "60-S";ENDIF
IF OPTNUM = 7 THEN CHANGE psched IN pipef TO "80-S";ENDIF
IF OPTNUM = 8 THEN CHANGE psched IN pipef TO "100-S";ENDIF
IF OPTNUM = 9 THEN CHANGE psched IN pipef TO "120-S";ENDIF
IF OPTNUM = 10 THEN CHANGE psched IN pipef TO "140-S";ENDIF
IF OPTNUM = 11 THEN CHANGE psched IN pipef TO "160-S";ENDIF
IF OPTNUM = 12 THEN CHANGE psched IN pipef TO "405-S";ENDIF
IF OPTNUM = 13 THEN CHANGE psched IN pipef TO "805-S";ENDIF
IF OPTNUM = 14 THEN CHANGE psched IN pipef TO "5";ENDIF
IF OPTNUM = 15 THEN CHANGE psched IN pipef TO "10";ENDIF
IF OPTNUM = 16 THEN CHANGE psched IN pipef TO "30";ENDIF
IF OPTNUM = 17 THEN CHANGE psched IN pipef TO "40";ENDIF
IF OPTNUM = 18 THEN CHANGE psched IN pipef TO "80";ENDIF
IF OPTNUM = 19 THEN CHANGE psched IN pipef TO "60";ENDIF
IF OPTNUM = 20 THEN CHANGE psched IN pipef TO "80";ENDIF
IF OPTNUM = 21 THEN CHANGE psched IN pipef TO "100";ENDIF
IF OPTNUM = 22 THEN CHANGE psched IN pipef TO "120";ENDIF
IF OPTNUM = 23 THEN CHANGE psched IN pipef TO "140";ENDIF
IF OPTNUM = 24 THEN CHANGE psched IN pipef TO "160";ENDIF
IF OPTNUM = 25 THEN CHANGE psched IN pipef TO "OTHER";ENDIF
AT 14, 11 OUTPUT pipef.psched
putform pipe4
let e.lstr=2; bmr""; at 4,57 input bmr; change bendmr in pipef to bmr; let e.lstr=80
END
AT 24, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
CLEAR
AT 5, 5 OUTPUT "DESIGN PARAMETERS"
AT 6, 5 OUTPUT "----------"
AT 7, 5 OUTPUT "1. Bend Angle"
AT 8, 5 OUTPUT "2. Maximum Design Pressure"
AT 9, 5 OUTPUT "3. Maximum Design Temperature"
AT 10, 5 OUTPUT "4. Nominal Operating Flow"
AT 11, 5 OUTPUT "5. Nominal Linear Flow"
AT 12, 5 OUTPUT "6. Maximum Operating Pressure"
AT 13, 5 OUTPUT "7. Maximum Operating Temperature"
AT 14, 5 OUTPUT "8. Nominal Size"
AT 15, 5 OUTPUT "9. Radius of Curvature"
AT 16, 5 OUTPUT "10. Section Modulus"
AT 17, 5 OUTPUT "11. Reducer Inlet Dia."
AT 5, 40 OUTPUT "VALUE"
AT 6, 40 OUTPUT "-----"
AT 7, 40 INPUT "DEG"
AT 8, 40 INPUT "PSIG"
AT 9, 40 INPUT "DEG"
AT 10, 40 OUTPUT "DEG"
AT 11, 40 INPUT "IN"
AT 12, 40 INPUT "IN"
AT 13, 40 INPUT "IN"
AT 14, 40 INPUT "IN"
AT 15, 40 OUTPUT "INCHES"
AT 16, 40 OUTPUT "------"
e.lnum = 6;e.desc = 2; e.lstr=8
bangm=0; at 8, 45 INPUT bang; CHANGE bendangl in pipef to bang
pmaxm=0; AT 9, 45 INPUT pmax; CHANGE maxpress in pipef to pmax
tmaxm=0; AT 9, 45 INPUT tmax; CHANGE maxtemp IN pipef TO tmax
nomflow=0; at 11, 45 INPUT nomflow; change nomflow in pipef to nomflow
e.lstr=0; nflow=""; at 11,50 input nflow; change nomflow in pipef to nflow
END
nlft=0; at 12,45 input nlft; change nomlenft in pipef to nlft
nopp=0; AT 13, 45 INPUT nopp; CHANGE noppress IN pipef TO nopp
```

PIPE IPF

this procedure is used to create records for the CREDO Supplemental Data Form for Pipe and Fittings

```
E.LSTR = 80
E.DECI = 0
E.LNUM = 2
USE "B:pipef.itb"
CLEAR
LOAD PERFORM "B:pipeandf.IPF"
PERFORM "B:pipeandf.IPF"
PUTFORM pipe1
OPTNUM = 0
AT 20, 39 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE ftype IN pipef TO "ADAPTERS";ENDIF
IF OPTNUM = 2 THEN CHANGE ftype IN pipef TO "BENDS";ENDIF
IF OPTNUM = 3 THEN CHANGE ftype IN pipef TO "CONWELD";ENDIF
IF OPTNUM = 4 THEN CHANGE ftype IN pipef TO "COUPLING";ENDIF
IF OPTNUM = 5 THEN CHANGE ftype IN pipef TO "EXPJOINT";ENDIF
IF OPTNUM = 6 THEN CHANGE ftype IN pipef TO "NOZZLES";ENDIF
IF OPTNUM = 7 THEN CHANGE ftype IN pipef TO "ORIFICE";ENDIF
IF OPTNUM = 8 THEN CHANGE ftype IN pipef TO "REDUCERS";ENDIF
IF OPTNUM = 9 THEN CHANGE ftype IN pipef TO "TEES";ENDIF
IF OPTNUM = 10 THEN CHANGE ftype IN pipef TO "THERWELD";ENDIF
IF OPTNUM = 11 THEN CHANGE ftype IN pipef TO "VENTURIS";ENDIF
IF OPTNUM = 12 THEN CHANGE ftype IN pipef TO "WYES";ENDIF
IF OPTNUM = 13 THEN CHANGE ftype IN pipef TO "OTHER";ENDIF
AT 17, 11 OUTPUT pipef.ftype
PUTFORM pipe2
OPTNUM = 0
AT 20, 39 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE medpro IN pipef TO "AIR";ENDIF
IF OPTNUM = 2 THEN CHANGE medpro IN pipef TO "CHEMSOL";ENDIF
IF OPTNUM = 3 THEN CHANGE medpro IN pipef TO "FUELOIL";ENDIF
IF OPTNUM = 4 THEN CHANGE medpro IN pipef TO "GAS";ENDIF
IF OPTNUM = 5 THEN CHANGE medpro IN pipef TO "LIQGAS";ENDIF
IF OPTNUM = 6 THEN CHANGE medpro IN pipef TO "LIQNA";ENDIF
IF OPTNUM = 7 THEN CHANGE medpro IN pipef TO "LIQNAK";ENDIF
IF OPTNUM = 8 THEN CHANGE medpro IN pipef TO "STEAM";ENDIF
IF OPTNUM = 9 THEN CHANGE medpro IN pipef TO "WATER";ENDIF
IF OPTNUM = 10 THEN CHANGE medpro IN pipef TO "OTHER";ENDIF
AT 20, 60 OUTPUT pipef.medpro
AT 24, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
clear
putform pipe3
optnum = 0
at 16,24 input optnum
IF OPTNUM = 1 THEN CHANGE psched IN pipef TO "5-S";ENDIF
IF OPTNUM = 2 THEN CHANGE psched IN pipef TO "10-S";ENDIF
IF OPTNUM = 3 THEN CHANGE psched IN pipef TO "20-S";ENDIF
IF OPTNUM = 4 THEN CHANGE psched IN pipef TO "30-S";ENDIF
IF OPTNUM = 5 THEN CHANGE psched IN pipef TO "40-S";ENDIF
IF OPTNUM = 6 THEN CHANGE psched IN pipef TO "60-S";ENDIF
IF OPTNUM = 7 THEN CHANGE psched IN pipef TO "80-S";ENDIF
IF OPTNUM = 8 THEN CHANGE psched IN pipef TO "100-S";ENDIF
IF OPTNUM = 9 THEN CHANGE psched IN pipef TO "120-S";ENDIF
IF OPTNUM = 10 THEN CHANGE psched IN pipef TO "140-S";ENDIF
IF OPTNUM = 11 THEN CHANGE psched IN pipef TO "160-S";ENDIF
IF OPTNUM = 12 THEN CHANGE psched IN pipef TO "405-S";ENDIF
IF OPTNUM = 13 THEN CHANGE psched IN pipef TO "805-S";ENDIF
IF OPTNUM = 14 THEN CHANGE psched IN pipef TO "5";ENDIF
IF OPTNUM = 15 THEN CHANGE psched IN pipef TO "10";ENDIF
IF OPTNUM = 16 THEN CHANGE psched IN pipef TO "20";ENDIF
IF OPTNUM = 17 THEN CHANGE psched IN pipef TO "30";ENDIF
IF OPTNUM = 18 THEN CHANGE psched IN pipef TO "40";ENDIF
IF OPTNUM = 19 THEN CHANGE psched IN pipef TO "60";ENDIF
IF OPTNUM = 20 THEN CHANGE psched IN pipef TO "80";ENDIF
IF OPTNUM = 21 THEN CHANGE psched IN pipef TO "100";ENDIF
IF OPTNUM = 22 THEN CHANGE psched IN pipef TO "120";ENDIF
IF OPTNUM = 23 THEN CHANGE psched IN pipef TO "140";ENDIF
IF OPTNUM = 24 THEN CHANGE psched IN pipef TO "160";ENDIF
IF OPTNUM = 25 THEN CHANGE psched IN pipef TO "OTHER";ENDIF
AT 14, 11 OUTPUT pipef.psched
putform pipe4
let e.lstr=8; bm=""; at 4,57 input bm; change basemat in pipef to bm; let e.lstr
=80
AT 24, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
CLEAR
AT 5, 5 OUTPUT "DESIGN PARAMETERS"
AT 6, 5 OUTPUT "-----------------"
AT 8, 5 OUTPUT "1. Bend Angle"
AT 9, 5 OUTPUT "2. Maximum Design Pressure"
AT 10, 5 OUTPUT "3. Maximum Design Temperature"
AT 11, 5 OUTPUT "4. Nominal Operating Flow*"
AT 12, 5 OUTPUT "5. Nominal Linear Feet"
AT 13, 5 OUTPUT "6. Nominal Operating Pressure"
at 14, 5 output "7. Nominal Operating Temperature"
at 15, 5 output "8. Nominal Size"
at 16, 5 output "9. Radius of Curvature"
at 17, 4 output "10. Reducer Inlet (Large End)"
at 18, 4 output "11. Reducer Inlet (Small End)"
AT 5, 65 OUTPUT "UNITS"
AT 6, 65 OUTPUT "-----"
AT 8, 65 OUTPUT "DEG"
AT 9, 65 OUTPUT "PSIG"
AT 10, 65 OUTPUT "DEGF"
AT 12, 65 OUTPUT "FT"
AT 13, 65 OUTPUT "PSIG"
AT 14, 65 OUTPUT "DEGF"
AT 15, 65 OUTPUT "IN"
at 16, 65 output "IN"
at 17, 65 output "IN"
at 18, 65 output "IN"
at 5, 45 OUTPUT "VALUE"
AT 6, 45 OUTPUT "-----"
e.lnum = 6;e.deci = 2; e.lstr=8
bang=0; at 8, 45 INPUT bang; CHANGE bendangl in pipef to bang
maxp=0; AT 9, 45 INPUT maxp; CHANGE maxpress in pipef to maxp
maxt=0; AT 10, 45 INPUT maxt; CHANGE maxtemp IN pipef TO maxt
nflow=0; AT 11, 45 INPUT nflow; CHANGE nomflow IN pipef TO nflow
let e.lstr=8; nflowu=""; at 11,65 input nflowu; change nomflowu in pipef to nflo
wu
nlft=0; at 12,45 input nlft; change nomlinft in pipef to nlft
nopp=0; AT 13, 45 INPUT nopp; CHANGE noppress IN pipef TO nopp
```

```
nopt=0; AT 14, 45 INPUT nopt; CHANGE noptemp IN pipef TO nopt
nsize=0; AT 15, 45 INPUT nsize; CHANGE nomsize IN pipef TO nsize
radc=0; at 16, 45 input radc; change radcurv in pipef to radc
rinl=0; at 17, 45 INPUT rinl; CHANGE reducinl in pipef to rinl
rins=0; at 18, 45 INPUT rins; CHANGE reducins in pipef to rins
CONVERT ftype, medpro, psched, basemat, bendangl, maxpress, maxtemp, nomflow, no
mflowu, nomlinft, noppress, noptemp, nomsize, radcurv, reducinl, reducins from p
ipef to "b:sumdont.txt"
USE "B:pipefits.itb"
ATTACH "B:sumdont.TXT" TO pipefits
RUN "ERASE B:sumdont.TXT"
OPTNUM = 0; E.DECI = 5
E.LSTR = 15; E.LNUM = 14
FINISH ALL; RETURN
```

this procedure called by pipe.ipf

PIPEANDF IPF

```
FORM PIPE1
        AT 1, 20 PUT "CREDO ENGINEERING DATA SUPPLEMENT"
        AT 3, 24 PUT "PIPE AND FITTINGS (PIPE)"
        AT 4, 24 PUT "-------------------------"
        AT 6, 5 PUT "FITTING TYPE"
        AT 7, 5 PUT "------------"
        AT 9, 3 PUT "1. Adapter"
        AT 9, 27 PUT "8. Reducer"
        AT 10, 3 PUT "2. Bend"
        AT 10, 27 PUT "9. Tee"
        AT 11, 3 PUT "3. Connecting Weld"
        AT 11, 26 PUT "10. Thermowell"
        AT 12, 3 PUT "4. Coupling"
        AT 12, 26 PUT "11. Venturi"
        AT 13, 3 PUT "5. Expansion Joint"
        AT 13, 26 PUT "12. Wye"
        AT 14, 3 PUT "6. Nozzle"
        AT 14, 26 PUT "13. Other"
        AT 15, 3 PUT "7. Orifice"
        AT 17, 3 PUT "Keyword"
        AT 20, 18 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM PIPE2
        AT 6, 54 PUT "MEDIUM PROCESSED"
        AT 7, 54 PUT "----------------"
        AT 9, 52 PUT "1. Air"
        AT 10, 52 PUT "2. Chemical Solution"
        AT 11, 52 PUT "3. Fuel/Oil"
        AT 12, 52 PUT "4. Gas"
        AT 13, 52 PUT "5. Liquid Gas"
        AT 14, 52 PUT "6. Liquid Sodium"
        AT 15, 52 PUT "7. Liquid Sodium/Potassium"
        AT 16, 52 PUT "8. Steam"
        AT 17, 52 PUT "9. Water"
        AT 18, 51 PUT "10. Other"
        AT 20, 52 PUT "Keyword"
ENDFORM
FORM PIPE3
        AT 1, 5 PUT "PIPE SCHEDULE"
        AT 2, 5 PUT "-------------"
        AT 4, 3 PUT "1. 5S"
        AT 4, 17 PUT "10. 140S"
        AT 4, 31 PUT "19. 60"
        AT 5, 3 PUT "2. 10S"
        AT 5, 17 PUT "11. 160S"
        AT 5, 31 PUT "20. 80"
        AT 6, 3 PUT "3. 20S"
        AT 6, 17 PUT "12. 405S"
        AT 6, 31 PUT "21. 100"
        AT 7, 3 PUT "4. 30S"
        AT 7, 17 PUT "13. 805S"
        AT 7, 31 PUT "22. 120"
        AT 8, 3 PUT "5. 40S"
        AT 8, 17 PUT "14. 5"
        AT 8, 31 PUT "23. 140"
        AT 9, 3 PUT "6. 60S"
        AT 9, 17 PUT "15. 10"
        AT 9, 31 PUT "24. 160"
        AT 10, 3 PUT "7. 80S"
        AT 10, 17 PUT "16. 20"
        AT 10, 31 PUT "25. Other"
        AT 11, 3 PUT "8. 100S"
        AT 11, 17 PUT "17. 30"
        AT 12, 3 PUT "9. 120S"
        AT 12, 17 PUT "18. 40"
        AT 14, 3 PUT "Keyword"
        AT 16, 3 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM PIPE4
        AT 1, 51 PUT "BASIC MATERIAL*"
        AT 2, 51 PUT "---------------"
        AT 4, 49 PUT "Keyword"
        AT 19, 3 PUT "*Refer to CREDO materials list (Table 6, Appendix A of the
 CREDO Guide for "
        AT 20, 3 PUT " Completing Data Input Forms and insert a coded word for m
aterial)."
ENDFORM
```

PVESSEL IPF

this procedure is used to create records for the CREDO Supplemental Data Form for Pressure Vessels and Tanks

```
E.LSTR = 80
E.DECI = 0
E.LNUM = 2
USE "B:pves.itb"
CLEAR
LOAD PERFORM "B:pressves.IPF"
PERFORM "B:pressves.IPF"
PUTFORM press1
OPTNUM = 0
AT 20, 39 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE TWORD IN pves TO "ACUMLATR";ENDIF
IF OPTNUM = 2 THEN CHANGE TWORD IN pves TO "CHEMPROC";ENDIF
IF OPTNUM = 3 THEN CHANGE TWORD IN pves TO "CONTAIN";ENDIF
IF OPTNUM = 4 THEN CHANGE TWORD IN pves TO "DEMIN";ENDIF
IF OPTNUM = 5 THEN CHANGE TWORD IN pves TO "DRAINDMP";ENDIF
IF OPTNUM = 6 THEN CHANGE TWORD IN pves TO "EXPANSN";ENDIF
IF OPTNUM = 7 THEN CHANGE TWORD IN pves TO "FIRESUP";ENDIF
IF OPTNUM = 8 THEN CHANGE TWORD IN pves TO "FUELOIL";ENDIF
IF OPTNUM = 9 THEN CHANGE TWORD IN pves TO "GASREC";ENDIF
IF OPTNUM = 10 THEN CHANGE TWORD IN pves TO "MAKEUP";ENDIF
IF OPTNUM = 11 THEN CHANGE TWORD IN pves TO "PREHEAT";ENDIF
IF OPTNUM = 12 THEN CHANGE TWORD IN pves TO "PROCWATR";ENDIF
IF OPTNUM = 13 THEN CHANGE TWORD IN pves TO "REACTVES";ENDIF
IF OPTNUM = 14 THEN CHANGE TWORD IN pves TO "STEAM";ENDIF
IF OPTNUM = 15 THEN CHANGE TWORD IN pves TO "STMCOND";ENDIF
IF OPTNUM = 16 THEN CHANGE TWORD IN pves TO "OTHER";ENDIF
AT 18, 11 OUTPUT pves.TWORD
PUTFORM press2
OPTNUM = 0
AT 20, 39 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE shape IN pves TO "CUBIC";ENDIF
IF OPTNUM = 2 THEN CHANGE shape IN pves TO "CYLINDER";ENDIF
IF OPTNUM = 3 THEN CHANGE shape IN pves TO "RECTANG";ENDIF
IF OPTNUM = 4 THEN CHANGE shape IN pves TO "SPHERE";ENDIF
IF OPTNUM = 5 THEN CHANGE shape IN pves TO "OTHER";ENDIF
AT 15, 60 OUTPUT pves.shape
AT 24, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
clear
putform press3
optnum = 0
at 12,24 input optnum
IF OPTNUM = 1 THEN CHANGE medpro IN pves TO "CHEM";ENDIF
IF OPTNUM = 2 THEN CHANGE medpro IN pves TO "FUELOIL";ENDIF
IF OPTNUM = 3 THEN CHANGE medpro IN pves TO "GAS";ENDIF
IF OPTNUM = 4 THEN CHANGE medpro IN pves TO "LIQNA";ENDIF
IF OPTNUM = 5 THEN CHANGE medpro IN pves TO "LIQNAK";ENDIF
IF OPTNUM = 6 THEN CHANGE medpro IN pves TO "STEAM";ENDIF
IF OPTNUM = 7 THEN CHANGE medpro IN pves TO "WATER";ENDIF
IF OPTNUM = 8 THEN CHANGE medpro IN pves TO "OTHER";ENDIF
AT 9, 11 OUTPUT pves.medpro
putform press4
putform press5
let e.lstr=8
tbm=""; at 18,11 input tbm; change tankbm in pves to tbm
tlm=""; at 18,46 input tlm; change tanklm in pves to tlm
let e.lstr=80
AT 24, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
CLEAR
AT 5, 5 OUTPUT "DESIGN PARAMETERS"
AT 6, 5 OUTPUT "-----------------"
AT 8, 5 OUTPUT "1. Liner Thickness"
AT 9, 5 OUTPUT "2. Maximum Design Pressure"
AT 10, 5 OUTPUT "3. Maximum Design Temperature"
AT 11, 5 OUTPUT "4. Nominal Flow Through or"
AT 12, 8 output "out of Tank"
AT 13, 5 OUTPUT "5. Nominal Operating Pressure"
AT 14, 5 OUTPUT "6. Nominal Operating Temperature"
AT 15, 5 OUTPUT "7. Tank Gas Volume"
at 16, 5 output "8. Tank Liquid Volume"
at 17, 5 output "9. Wall Thickness"
AT 5, 65 OUTPUT "UNITS"
AT 6, 65 OUTPUT "-----"
AT 8, 65 OUTPUT "IN"
AT 9, 65 OUTPUT "PSIG"
AT 10, 65 OUTPUT "DEGF"
AT 11, 65 OUTPUT "GPM"
AT 13, 65 OUTPUT "PSIG"
AT 14, 65 OUTPUT "DEGF"
AT 15, 65 OUTPUT "FT3"
AT 16, 65 OUTPUT "GALLON"
at 17, 65 output "IN"
at 5, 45 OUTPUT "VALUE"
AT 6, 45 OUTPUT "-----"
e.lnum = 6;e.deci = 2
lthick=0; at 8, 45 INPUT lthick; CHANGE linerthk in pves to lthick
maxp=0; AT 9, 45 INPUT maxp; CHANGE maxpress in pves to maxp
maxt=0; AT 10, 45 INPUT maxt; CHANGE maxtemp IN pves TO maxt
nflow=0; AT 11, 45 INPUT nflow; CHANGE nomflow IN pves TO nflow
nopp=0; AT 13, 45 INPUT nopp; CHANGE noppress IN pves TO nopp
nopt=0; AT 14, 45 INPUT nopt; CHANGE noptemp IN pves TO nopt
tgasvol=0; at 15,45 input tgasvol; change tankgvol in pves to tgasvol
tliqvol=0; at 16, 45 input tliqvol; change tanklvol in pves to tliqvol
tthick=0; at 17, 45 INPUT tthick; CHANGE tankthk in pves to tthick
CONVERT TWORD, shape, MEDPRO, tankbm, tanklm, linerthk, maxpress, maxtemp, nomfl
ow, noppress, noptemp, tankgvol, tanklvol, tankthk from pves to "b:sumdo.txt"
USE "B:presv.ITB"
ATTACH "B:sumdo.TXT" TO presv
RUN "ERASE B:sumdo.TXT"
OPTNUM = 0; E.DECI = 5
E.LSTR = 15; E.LNUM = 14
FINISH ALL; RETURN
```

this procedure called by pvessel.ipf

PRESSVES IPF

```
FORM PRESS1
        AT 1, 20 PUT "CREDO ENGINEERING DATA SUPPLEMENT"
        AT 3, 19 PUT "PRESSURE VESSELS AND TANKS (PVESSEL)"
        AT 4, 19 PUT "-------------------------------------"
        AT 6, 5 PUT "TYPE"
        AT 7, 5 PUT "----"
        AT 9, 3 PUT "1. Accumulator"
        AT 9, 27 PUT "9. Gas Receiver"
        AT 10, 3 PUT "2. Chemical Process"
        AT 10, 26 PUT "10. Make-up"
        AT 11, 3 PUT "3. Containment"
        AT 11, 26 PUT "11. Pre-Heat"
        AT 12, 3 PUT "4. Demineralizer"
        AT 12, 26 PUT "12. Process Water"
        AT 13, 3 PUT "5. Drain/Dump"
        AT 13, 26 PUT "13. Reactor Vessel"
        AT 14, 3 PUT "6. Expansion"
        AT 14, 26 PUT "14. Steam"
        AT 15, 3 PUT "7. Fire Suppression"
        AT 15, 26 PUT "15. Steam Condensate"
        AT 16, 3 PUT "8. Fuel/Oil"
        AT 16, 26 PUT "16. Other"
        AT 18, 3 PUT "Keyword"
        AT 20, 18 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM PRESS2
        AT 6, 54 PUT "SHAPE"
        AT 7, 54 PUT "-----"
        AT 9, 52 PUT "1. Cubic"
        AT 10, 52 PUT "2. Cylindrical"
        AT 11, 52 PUT "3. Rectangular"
        AT 12, 52 PUT "4. Spherical"
        AT 13, 52 PUT "5. Other"
        AT 15, 52 PUT "Keyword"
ENDFORM
FORM PRESS3
        AT 1, 5 PUT "MEDIUM PROCESSED"
        AT 2, 5 PUT "----------------"
        AT 4, 3 PUT "1. Chemicals"
        AT 4, 25 PUT "5. Liquid Sodium/Potassium"
        AT 5, 3 PUT "2. Fuel/Oils"
        AT 5, 25 PUT "6. Steam"
        AT 6, 3 PUT "3. Gas"
        AT 6, 25 PUT "7. Water"
        AT 7, 3 PUT "4. Liquid Sodium"
        AT 7, 25 PUT "8. Other"
        AT 9, 3 PUT "Keyword"
        AT 12, 3 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM PRESS4
        AT 15, 3 PUT "TANK BASIC MATERIAL*"
        AT 16, 3 PUT "-------------------"
        AT 18, 3 PUT "Keyword"
        AT 21, 3 PUT "*Refer to CREDO materials list (Table 6, Appendix A of the
 CREDO Guide for "
        AT 22, 3 PUT " Completing Data Input Forms and insert a coded word for m
aterial)."
ENDFORM
FORM PRESS5
        AT 15, 38 PUT "TANK LINER MATERIAL*"
        AT 16, 38 PUT "--------------------"
        AT 18, 38 PUT "Keyword"
ENDFORM
```

RECOMB IPF

this procedure is used to create records for the CREDO Supplemental Data Form for Recombiners

```
E.LSTR = 80
E.DECI = 0
E.LNUM = 2
USE "B:recb.itb"
CLEAR
LOAD PERFORM "B:recombin.IPF"
PERFORM "B:recombin.IPF"
PUTFORM rec1
OPTNUM = 0
AT 21, 39 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE TWORD IN recb TO "CATALYTC";ENDIF
IF OPTNUM = 2 THEN CHANGE TWORD IN recb TO "FLAME";ENDIF
IF OPTNUM = 3 THEN CHANGE TWORD IN recb TO "THERMAL";ENDIF
IF OPTNUM = 4 THEN CHANGE TWORD IN recb TO "OTHER";ENDIF
AT 18, 11 OUTPUT recb.TWORD
PUTFORM rec2
OPTNUM = 0
AT 21, 39 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE iagent IN recb TO "AIR";ENDIF
IF OPTNUM = 2 THEN CHANGE iagent IN recb TO "INERTGAS";ENDIF
IF OPTNUM = 3 THEN CHANGE iagent IN recb TO "STEAM";ENDIF
IF OPTNUM = 4 THEN CHANGE iagent IN recb TO "WATER";ENDIF
IF OPTNUM = 5 THEN CHANGE iagent IN recb TO "OTHER";ENDIF
AT 19, 32 OUTPUT recb.iagent
putform rec3
optnum = 0
at 21,39 input optnum
IF OPTNUM = 1 THEN CHANGE medpro IN recb TO "FLAMGAS";ENDIF
IF OPTNUM = 2 THEN CHANGE medpro IN recb TO "FLAMLIQ";ENDIF
IF OPTNUM = 3 THEN CHANGE medpro IN recb TO "LIQSOL";ENDIF
IF OPTNUM = 4 THEN CHANGE medpro IN recb TO "SOLIDS";ENDIF
AT 18, 57 OUTPUT recb.medpro
AT 24, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
CLEAR
putform rec4
let e.lstr=8; cmat=""; at 3,42; input cmat; let e.lstr=80
change compmat in recb to cmat
AT 9, 5 OUTPUT "DESIGN PARAMETERS"
AT 10, 5 OUTPUT "-----------------"
AT 12, 5 OUTPUT "1. Capacity Inerting Agent*"
AT 13, 5 OUTPUT "2. Capacity Media*"
AT 14, 5 OUTPUT "3. Design Heat Rate"
AT 15, 5 OUTPUT "4. Design Pressure"
AT 16, 5 OUTPUT "5. Flow Rate*"
AT 17, 5 OUTPUT "6. Maximum Flow Rate*"
AT 18, 5 OUTPUT "7. Minimum Flow Rate*"
at 19, 5 output "8. Operating Heat Rate"
at 20, 5 output "9. Operating Pressure"
at 21, 4 output "10. Operating Temperature"
AT 9, 55 OUTPUT "UNITS"
AT 10, 55 OUTPUT "-----"
AT 14, 55 OUTPUT "BTUH"
AT 15, 55 OUTPUT "PSIG"
AT 19, 55 OUTPUT "BTUH"
AT 20, 55 OUTPUT "PSIG"
AT 21, 55 OUTPUT "DEGF"
at 9, 40 OUTPUT "VALUE"
AT 10, 40 OUTPUT "-----"
at 23, 5 output "*Refer to CREDO component descriptors unit abbreviations for pr
oper units"
at 24. 5 output "(Table 7, Appendix A of the CREDO Guide for Completing Data Inp
ut Forms)."
e.lnum = 6;e.deci = 2;e.lstr=8
ciagt=0; at 12, 40 INPUT ciagt; CHANGE capagent IN recb TO ciagt
ciagtu=""; at 12, 55 input ciagtu; change capagtun in recb to ciagtu
cmed=0; AT 13, 40 INPUT cmed; CHANGE capmed IN recb TO cmed
cmedu=""; at 13, 55 input cmedu; change capmedun in recb to cmedu
desh=0; AT 14, 40 INPUT desh; CHANGE deshtrat IN recb TO desh
desp=0; AT 15, 40 INPUT desp; CHANGE despress IN recb TO desp
frate=0; AT 16, 40 INPUT frate; CHANGE flowrate IN recb TO frate
frateu=""; at 16, 55 input frateu; change flowrtun in recb to frateu
mfrate=0; AT 17, 40 INPUT mfrate; CHANGE maxfrate IN recb TO mfrate
mfrateu=""; at 17, 55 input mfrateu; change maxfrtun in recb to mfrateu
mnfrate=0; AT 18, 40 INPUT mnfrate; CHANGE minfrate IN recb TO mnfrate
mnfrateu=""; at 18, 55 input mnfrateu; change minfrtun in recb to mnfrateu
oph=0; at 19, 40 input oph; change ophtrate in recb to oph
opp=0; at 20, 40 input opp; change oppress in recb to opp
opt=0; at 21, 40 input opt; change optemp in recb to opt
CONVERT TWORD, iagent, MEDPRO, capagent, capagtun, capmed, capmedun, deshtrat, d
espress, flowrate, flowrtun, maxfrate, maxfrtun, minfrate, minfrtun, ophtrate, c
ppress, optemp, compmat from recb to "b:sumcan.txt"
USE "B:recombs.ITB"
ATTACH "B:sumcan.TXT" TO recombs
RUN "ERASE B:sumcan.TXT"
OPTNUM = 0; E.DECI = 5;
E.LSTR = 15; E.LNUM = 14
FINISH ALL; RETURN
```

this procedure called by recomb.ipf

RECOMBIN IPF

```
FORM REC1
        AT 5, 20 PUT "CREDO ENGINEERING DATA SUPPLEMENT"
        AT 7, 26 PUT "RECOMBINERS (RECOMB)"
        AT 8, 26 PUT "----------------------"
        AT 10, 5 PUT "TYPE"
        AT 11, 5 PUT "----"
        AT 13, 3 PUT "1. Catalytic"
        AT 14, 3 PUT "2. Flame"
        AT 15, 3 PUT "3. Thermal"
        AT 16, 3 PUT "4. Other"
        AT 18, 3 PUT "Keyword"
        AT 21, 18 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM REC2
        AT 10, 26 PUT "INERTING AGENT"
        AT 11, 26 PUT "--------------"
        AT 13, 24 PUT "1. Air"
        AT 14, 24 PUT "2. Inert Gas"
        AT 15, 24 PUT "3. Steam"
        AT 16, 24 PUT "4. Water"
        AT 17, 24 PUT "5. Other"
        AT 19, 24 PUT "Keyword"
ENDFORM
FORM REC3
        AT 10, 51 PUT "MEDIUM PROCESSED"
        AT 11, 51 PUT "----------------"
        AT 13, 49 PUT "1. Flammable Gas"
        AT 14, 49 PUT "2. Flammable Liquid"
        AT 15, 49 PUT "3. Liquid Solutions"
        AT 16, 49 PUT "4. Solids (Powders, Grit, etc.)"
        AT 18, 49 PUT "Keyword"
ENDFORM
FORM REC4
        AT 3, 5 PUT "MAJOR COMPONENT MATERIAL*"
        AT 4, 5 PUT "------------------------"
     at 3, 34 put "Keyword"
        AT 6, 5 PUT "*Refer to CREDO materials list (Table 6, Appendix A for the
 CREDO Guide"
        AT 7, 5 PUT "for Completing Data Input Forms) and insert a coded word fo
r material."
ENDFORM
```

VALVE IPF

this procedure is used to create records for the CREDO Supplemental Data Form for Valves

```
E.LSTR = 80
E.DECI = 0
E.LNUM = 2
USE "B:valvs.itb"
CLEAR
LOAD PERFORM "B:valves.ipf"
PERFORM "B:valves.IPF"
PUTFORM valv1
OPTNUM = 0
AT 22, 35 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE vtype IN valvs TO "BALL";ENDIF
IF OPTNUM = 2 THEN CHANGE vtype IN valvs TO "BLADE";ENDIF
IF OPTNUM = 3 THEN CHANGE vtype IN valvs TO "MLTBLADE";ENDIF
IF OPTNUM = 4 THEN CHANGE vtype IN valvs TO "OPPBLADE";ENDIF
IF OPTNUM = 5 THEN CHANGE vtype IN valvs TO "BUTTRFLY";ENDIF
IF OPTNUM = 6 THEN CHANGE vtype IN valvs TO "CHECK";ENDIF
IF OPTNUM = 7 THEN CHANGE vtype IN valvs TO "CYLINDER";ENDIF
IF OPTNUM = 8 THEN CHANGE vtype IN valvs TO "DIAPHRAM";ENDIF
IF OPTNUM = 9 THEN CHANGE vtype IN valvs TO "GATE";ENDIF
IF OPTNUM = 10 THEN CHANGE vtype IN valvs TO "GLOBE";ENDIF
IF OPTNUM = 11 THEN CHANGE vtype IN valvs TO "LOUVER";ENDIF
IF OPTNUM = 12 THEN CHANGE vtype IN valvs TO "MVENTURI";ENDIF
IF OPTNUM = 13 THEN CHANGE vtype IN valvs TO "NEEDLE";ENDIF
IF OPTNUM = 14 THEN CHANGE vtype IN valvs TO "NOZZLE";ENDIF
IF OPTNUM = 15 THEN CHANGE vtype IN valvs TO "PLUG";ENDIF
IF OPTNUM = 16 THEN CHANGE vtype IN valvs TO "OTHER";ENDIF
AT 18, 11 OUTPUT valvs.vtype
PUTFORM valv2
OPTNUM = 0
AT 22, 35 INPUT OPTNUM
IF OPTNUM = 1 THEN CHANGE functapp IN valvs TO "BYPASS";ENDIF
IF OPTNUM = 2 THEN CHANGE functapp IN valvs TO "FLOCNTRL";ENDIF
IF OPTNUM = 3 THEN CHANGE functapp IN valvs TO "STOP";ENDIF
IF OPTNUM = 4 THEN CHANGE functapp IN valvs TO "LVLCNTRL";ENDIF
IF OPTNUM = 5 THEN CHANGE functapp IN valvs TO "MLTIPURP";ENDIF
IF OPTNUM = 6 THEN CHANGE functapp IN valvs TO "PILOT";ENDIF
IF OPTNUM = 7 THEN CHANGE functapp IN valvs TO "PRESSCON";ENDIF
IF OPTNUM = 8 THEN CHANGE functapp IN valvs TO "PRESSREL";ENDIF
IF OPTNUM = 9 THEN CHANGE functapp IN valvs TO "TEMPCONT";ENDIF
IF OPTNUM = 10 THEN CHANGE functapp IN valvs TO "TIMECYCL";ENDIF
IF OPTNUM = 11 THEN CHANGE functapp IN valvs TO "VACREL";ENDIF
IF OPTNUM = 12 THEN CHANGE functapp IN valvs TO "OTHER";ENDIF
AT 22, 60 OUTPUT valvs.functapp
AT 24, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
clear
putform valv3
optnum = 0
at 20,49 input optnum
IF OPTNUM = 1 THEN CHANGE functchr IN valvs TO "ANGLE";ENDIF
IF OPTNUM = 2 THEN CHANGE functchr IN valvs TO "CONVENT";ENDIF
IF OPTNUM = 3 THEN CHANGE functchr IN valvs TO "CRYO";ENDIF
IF OPTNUM = 4 THEN CHANGE functchr IN valvs TO "5WAY";ENDIF
IF OPTNUM = 5 THEN CHANGE functchr IN valvs TO "4WAY";ENDIF
IF OPTNUM = 6 THEN CHANGE functchr IN valvs TO "MULTVARY";ENDIF
IF OPTNUM = 7 THEN CHANGE functchr IN valvs TO "6WAY";ENDIF
IF OPTNUM = 8 THEN CHANGE functchr IN valvs TO "SPRNGCHK";ENDIF
IF OPTNUM = 9 THEN CHANGE functchr IN valvs TO "SWINGCHK";ENDIF
IF OPTNUM = 10 THEN CHANGE functchr IN valvs TO "3WAY";ENDIF
IF OPTNUM = 11 THEN CHANGE functchr IN valvs TO "WYE";ENDIF
IF OPTNUM = 12 THEN CHANGE functchr IN valvs TO "OTHER";ENDIF
AT 17, 14 OUTPUT valvs.functchr
putform valv4
optnum = 0
at 20,49 input optnum
IF OPTNUM = 1 THEN CHANGE medpro IN valvs TO "AIR";ENDIF
IF OPTNUM = 2 THEN CHANGE medpro IN valvs TO "CHEMICAL";ENDIF
IF OPTNUM = 3 THEN CHANGE medpro IN valvs TO "GAS";ENDIF
IF OPTNUM = 4 THEN CHANGE medpro IN valvs TO "LIQGAS";ENDIF
IF OPTNUM = 5 THEN CHANGE medpro IN valvs TO "PFUEL";ENDIF
IF OPTNUM = 6 THEN CHANGE medpro IN valvs TO "PETROILS";ENDIF
IF OPTNUM = 7 THEN CHANGE medpro IN valvs TO "RADGAS";ENDIF
IF OPTNUM = 8 THEN CHANGE medpro IN valvs TO "RADWASTE";ENDIF
IF OPTNUM = 9 THEN CHANGE medpro IN valvs TO "SILICONE";ENDIF
IF OPTNUM = 10 THEN CHANGE medpro IN valvs TO "NA";ENDIF
IF OPTNUM = 11 THEN CHANGE medpro IN valvs TO "NAK";ENDIF
IF OPTNUM = 12 THEN CHANGE medpro IN valvs TO "STEAM";ENDIF
IF OPTNUM = 13 THEN CHANGE medpro IN valvs TO "VACUUM";ENDIF
IF OPTNUM = 14 THEN CHANGE medpro IN valvs TO "WATER";ENDIF
IF OPTNUM = 15 THEN CHANGE medpro IN valvs TO "OTHER";ENDIF
AT 13,48 OUTPUT valvs.medpro
AT 24, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
clear
putform valv5
optnum = 0
at 20,49 input optnum
IF OPTNUM = 1 THEN CHANGE seal IN valvs TO "BELLOWS";ENDIF
IF OPTNUM = 2 THEN CHANGE seal IN valvs TO "BELLFREZ";ENDIF
IF OPTNUM = 3 THEN CHANGE seal IN valvs TO "BELLPACK";ENDIF
IF OPTNUM = 4 THEN CHANGE seal IN valvs TO "FREEZE";ENDIF
IF OPTNUM = 5 THEN CHANGE seal IN valvs TO "GASINJCT";ENDIF
IF OPTNUM = 6 THEN CHANGE seal IN valvs TO "METAL";ENDIF
IF OPTNUM = 7 THEN CHANGE seal IN valvs TO "ORING";ENDIF
IF OPTNUM = 8 THEN CHANGE seal IN valvs TO "PACKING";ENDIF
IF OPTNUM = 9 THEN CHANGE seal IN valvs TO "OTHER";ENDIF
AT 14,14 OUTPUT valvs.seal
putform valv6
optnum = 0
at 20,49 input optnum
IF OPTNUM = 1 THEN CHANGE optype IN valvs TO "MOTOR";ENDIF
IF OPTNUM = 2 THEN CHANGE optype IN valvs TO "SOLENOID";ENDIF
IF OPTNUM = 3 THEN CHANGE optype IN valvs TO "EXPLOSIV";ENDIF
IF OPTNUM = 4 THEN CHANGE optype IN valvs TO "FLOAT";ENDIF
IF OPTNUM = 5 THEN CHANGE optype IN valvs TO "HYDRAUL";ENDIF
IF OPTNUM = 6 THEN CHANGE optype IN valvs TO "MANUAL";ENDIF
IF OPTNUM = 7 THEN CHANGE optype IN valvs TO "SPRING";ENDIF
IF OPTNUM = 8 THEN CHANGE optype IN valvs TO "PNEUMAT";ENDIF
IF OPTNUM = 9 THEN CHANGE optype IN valvs TO "OTHER";ENDIF
AT 14,51 OUTPUT valvs.optype
AT 24, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
clear
PUTFORM valv7
OPTNUM = 0
AT 13, 62 INPUT OPTNUM
```

```
IF OPTNUM = 1 THEN CHANGE valvconn IN valvs TO "BUTTWELD";ENDIF
IF OPTNUM = 2 THEN CHANGE valvconn IN valvs TO "DISOLVNG";ENDIF
IF OPTNUM = 3 THEN CHANGE valvconn IN valvs TO "FLNGWELD";ENDIF
IF OPTNUM = 4 THEN CHANGE valvconn IN valvs TO "FLATFLNG";ENDIF
IF OPTNUM = 5 THEN CHANGE valvconn IN valvs TO "NATHREAD";ENDIF
IF OPTNUM = 6 THEN CHANGE valvconn IN valvs TO "GLUE";ENDIF
IF OPTNUM = 7 THEN CHANGE valvconn IN valvs TO "PSTUBING";ENDIF
IF OPTNUM = 8 THEN CHANGE valvconn IN valvs TO "RAISFLNG";ENDIF
IF OPTNUM = 9 THEN CHANGE valvconn IN valvs TO "SOCKET";ENDIF
IF OPTNUM = 10 THEN CHANGE valvconn IN valvs TO "SPTHREAD";ENDIF
IF OPTNUM = 11 THEN CHANGE valvconn IN valvs TO "THRDWELD";ENDIF
IF OPTNUM = 12 THEN CHANGE valvconn IN valvs TO "TUBEFLNG";ENDIF
IF OPTNUM = 13 THEN CHANGE valvconn IN valvs TO "TUBETHRD";ENDIF
IF OPTNUM = 14 THEN CHANGE valvconn IN valvs TO "TUBEWELD";ENDIF
IF OPTNUM = 15 THEN CHANGE valvconn IN valvs TO "OTHER";ENDIF
AT 13, 11 OUTPUT valvs.valvconn
putform valv8
putform valv9
putform valv10
putform valv11
let e.lstr=8
tm=""; at 18,11 input tm; change tankmat in valvs to tm
bm=""; at 18,31 input bm; change bodymat in valvs to bm
pm=""; at 18,51 input pm; change pipemat in valvs to pm
sm=""; at 18,71 input sm; change seatmat in valvs to sm
let e.lstr=80
AT 24, 30 OUTPUT "PRESS RETURN TO CONTINUE";WAIT
CLEAR
AT 1, 5 OUTPUT "DESIGN PARAMETERS"
AT 2, 5 OUTPUT "-----------------"
AT 4, 5 OUTPUT "1. Design Pressure"
AT 5, 5 OUTPUT "2. Design Temperature"
AT 6, 5 OUTPUT "3. Nominal Operating Pressure"
AT 7, 5 OUTPUT "4. Nominal Operating Temperature"
AT 8, 5 OUTPUT "5. Nominal Pipe Size (Largest Dimens.)"
AT 9, 5 OUTPUT "6. Nominal Valve Size"
at 10, 5 output "7. Nominal Valve Stroke"
at 11, 5 output "8. Operator Actuation Force"
at 12, 5 output "9. Operator Actuation Time"
at 13, 4 output "10. Operator Actuation Torque"
at 14, 4 output "11. Operator Motor Rating"
at 15, 4 output "12. Operator Motor Voltage*"
at 16, 4 output "13. Pneumatic/Hydraulic Pressure to"
at 17, 8 output "Operator"
at 21,4 output "*Refer to CREDO component descriptors unit abbreviations for pro
per units"
at 22,5 output "(Table 7, Appendix A of the CREDO Guide for Completing Data Inpu
t Forms)."
AT 1, 65 OUTPUT "UNITS"
AT 2, 65 OUTPUT "-----"
AT 4, 65 OUTPUT "PSIG"
AT 5, 65 OUTPUT "DEGF"
AT 6, 65 OUTPUT "PSIG"
AT 7, 65 OUTPUT "DEGF"
AT 8, 65 OUTPUT "IN"
AT 9, 65 OUTPUT "IN"
AT 10, 65 OUTPUT "IN"
at 11, 65 output "LB"
at 12, 65 output "SEC"
at 13, 65 output "FTLB"
at 14, 65 output "HP"
at 16, 65 output "PSIG"
at 1, 45 OUTPUT "VALUE"
AT 2, 45 OUTPUT "-----"
e.lnum = 6;e.deci = 2;e.lstr=8
desp=0; at 4, 45 INPUT desp; CHANGE despress in valvs to desp
dest=0; AT 5, 45 INPUT dest; CHANGE destemp in valvs to dest
nopp=0; AT 6, 45 INPUT nopp; CHANGE noppress IN valvs TO nopp
nopt=0; AT 7, 45 INPUT nopt; CHANGE noptemp IN valvs TO nopt
npipes=0; at 8,45 input npipes; change npipesiz in valvs to npipes
nvals=0; AT 9, 45 INPUT nvals; CHANGE nvalvesiz IN valvs TO nvals
nvalst=0; AT 10, 45 INPUT nvalst; CHANGE nvalvstr in valvs to nvalst
opaf=0; AT 11, 45 INPUT opaf; CHANGE opactfor in valvs to opaf
opat=0; at 12, 45 input opat; change opacttim in valvs to opat
opatq=0; at 13, 45 INPUT opatq; CHANGE opacttrq in valvs to opatq
opmr=0; at 14, 45 INPUT opmr; CHANGE opmotorr in valvs to opmr
opmv=0; at 15, 45 INPUT opmv; CHANGE opmotorv in valvs to opmv
opmvu=""; at 15, 65 INPUT opmvu; CHANGE opmotoru in valvs to opmvu
ptoo=0; at 16, 45 INPUT ptoo; CHANGE prestoop in valvs to ptoo
CONVERT vtype, functapp, functchr, medpro, seal, optype, valvconn, despress, des
temp, noppress, noptemp, npipesiz, nvalvesiz, nvalvstr, opactfor, opacttim, opac
ttrq, opmotorr, opmotorv, opmotoru, prestoop, tankmat, bodymat\
pipemat, seatmat from valvs to "b:sumcant.txt"
USE "B:valv.itb"
ATTACH "B:sumcant.TXT" TO valv
RUN "ERASE B:sumcant.TXT"
OPTNUM = 0; E.DECI = 5
E.LSTR = 15; E.LNUM = 14
FINISH ALL; RETURN
```

this procedure called by valve.ipf

VALVES IPF

```
FORM VALV1
     AT 1, 20 PUT "CREDO ENGINEERING DATA SUPPLEMENT"
        AT 3, 29 PUT "VALVES (VALVE)"
        AT 4, 29 PUT "--------------"
        AT 6, 5 PUT "TYPE"
        AT 7, 5 PUT "----"
        AT 9, 3 PUT "1. Ball"
        AT 9, 27 PUT "9. Gate"
        AT 10, 3 PUT "2. Blade"
        AT 10, 26 PUT "10. Globe"
        AT 11, 3 PUT "3. Multiblade"
        AT 11, 26 PUT "11. Louver"
        AT 12, 3 PUT "4. Opposed Blade"
        AT 12, 26 PUT "12. Multiventuri"
        AT 13, 3 PUT "5. Butterfly"
        AT 13, 26 PUT "13. Needle"
        AT 14, 3 PUT "6. Check"
        AT 14, 26 PUT "14. Nozzle"
        AT 15, 3 PUT "7. Cylinder"
        AT 15, 26 PUT "15. Plug"
        AT 16, 3 PUT "8. Diaphragm"
        AT 16, 26 PUT "16. Other"
        AT 18, 3 PUT "Keyword"
        AT 22, 14 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM VALV2
        AT 6, 54 PUT "FUNCTIONAL/APPLICATION"
        AT 7, 54 PUT "----------------------"
        AT 9, 52 PUT "1. By-Pass"
        AT 10, 52 PUT "2. Flow Control"
        AT 11, 52 PUT "3. Isolation/Stop"
        AT 12, 52 PUT "4. Level Control"
        AT 13, 52 PUT "5. Multipurpose"
        AT 14, 52 PUT "6. Pilot"
        AT 15, 52 PUT "7. Pressure Control"
        AT 16, 52 PUT "8. Pressure Relief"
        AT 17, 52 PUT "9. Temperature Control"
        AT 18, 51 PUT "10. Time Cycled"
        AT 19, 51 PUT "11. Vacuum Relief"
        AT 20, 51 PUT "12. Other"
        AT 22, 52 PUT "Keyword"
ENDFORM
FORM VALV3
        AT 1, 8 PUT "FUNCTIONAL/CHARACTERISTICS"
        AT 2, 8 PUT "--------------------------"
        AT 4, 6 PUT "1. Angle"
        AT 5, 6 PUT "2. Conventional"
        AT 6, 6 PUT "3. Cryogenic"
        AT 7, 6 PUT "4. Five Way Selection"
        AT 8, 6 PUT "5. Four Way Selection"
        AT 9, 6 PUT "6. Multivarying"
        AT 10, 6 PUT "7. Six Way Selection"
        AT 11, 6 PUT "8. Spring Check"
        AT 12, 6 PUT "9. Swing Check"
        AT 13, 5 PUT "10. Three Way Selection"
        AT 14, 5 PUT "11. Wye"
        AT 15, 5 PUT "12. Other"
        AT 17, 6 PUT "Keyword"
        AT 20, 28 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM VALV4
        AT 1, 42 PUT "MEDIUM PROCESSED"
        AT 2, 42 PUT "----------------"
        AT 4, 40 PUT "1. Air"
        AT 4, 65 PUT "9. Silicones"
        AT 5, 40 PUT "2. Chemical Solutions"
        AT 5, 64 PUT "10. Sodium"
        AT 6, 40 PUT "3. Inert Gas"
        AT 6, 64 PUT "11. Sodium/"
        AT 7, 40 PUT "4. Liquid Gas"
        AT 7, 68 PUT "Potassium"
        AT 8, 40 PUT "5. Petrofuels"
        AT 8, 64 PUT "12. Steam"
        AT 9, 40 PUT "6. Petroleum Oils"
        AT 9, 64 PUT "13. Vacuum"
        AT 10, 40 PUT "7. Radioactive Gas"
        AT 10, 64 PUT "14. Water"
        AT 11, 40 PUT "8. Radioactive Waste"
        AT 11, 64 PUT "15. Other"
        AT 13, 40 PUT "Keyword"
ENDFORM
FORM VALV5
        AT 1, 8 PUT "SEAL"
        AT 2, 8 PUT "----"
        AT 4, 6 PUT "1. Bellows"
        AT 5, 6 PUT "2. Bellows & Freeze"
        AT 6, 6 PUT "3. Bellows & Packing"
        AT 7, 6 PUT "4. Freeze"
        AT 8, 6 PUT "5. Gas Injection"
        AT 9, 6 PUT "6. Metal"
        AT 10, 6 PUT "7. O-Ring"
        AT 11, 6 PUT "8. Packing"
        AT 12, 6 PUT "9. Other"
        AT 14, 6 PUT "Keyword"
        AT 20, 28 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM VALV6
        AT 1, 45 PUT "OPERATOR TYPE"
        AT 2, 45 PUT "-------------"
        AT 4, 43 PUT "1. Electric Motor"
        AT 5, 43 PUT "2. Electric Solenoid"
        AT 6, 43 PUT "3. Explosive Device"
        AT 7, 43 PUT "4. Float"
        AT 8, 43 PUT "5. Hydraulic"
        AT 9, 43 PUT "6. Manual"
        AT 10, 43 PUT "7. Mech/Spring"
        AT 11, 43 PUT "8. Pneumatic"
        AT 12, 43 PUT "9. Other"
        AT 14, 43 PUT "Keyword"
ENDFORM
```

```
FORM VALV7
        AT 1, 5 PUT "VALVE TO PIPE/EQUIPMENT CONNECTION"
        AT 2, 5 PUT "-----------------------------------"
        AT 4, 3 PUT "1. Buttweld"
        AT 4, 32 PUT "9. Socketweld"
        AT 5, 3 PUT "2. Dissolving"
        AT 5, 31 PUT "10. Special Thread"
        AT 6, 3 PUT "3. Flange & Weld"
        AT 6, 31 PUT "11. Thread & Weld"
        AT 7, 3 PUT "4. Flat Flange"
        AT 7, 31 PUT "12. Tubing & Flange"
        AT 8, 3 PUT "5. National Pipe Thread"
        AT 8, 31 PUT "13. Tubing & Thread"
        AT 9, 3 PUT "6. Plastic Melting"
        AT 9, 31 PUT "14. Tubing & Weld"
        AT 10, 3 PUT "7. Pressure/Squeeze Tubing"
        AT 10, 31 PUT "15. Other"
        AT 11, 3 PUT "8. Raised Flange"
        AT 13, 3 PUT "Keyword"
        AT 13, 41 PUT "ENTER OPTION NUMBER:"
ENDFORM
FORM VALV8
        AT 15, 3 PUT "TANK MATERIAL*"
        AT 16, 3 PUT "-------------"
        AT 18, 3 PUT "Keyword"
        AT 21, 3 PUT "*Refer to CREDO materials list (Table 6, Appendix A of the
 CREDO Guide for "
        AT 22, 3 PUT " Completing Data Input Forms and insert a coded word for m
aterial)."
ENDFORM
FORM VALV9
        AT 15, 23 PUT "BODY MATERIAL*"
        AT 16, 23 PUT "-------------"
        AT 18, 23 PUT "Keyword"
ENDFORM
FORM VALV10
        AT 15, 43 PUT "PIPE MATERIAL*"
        AT 16, 43 PUT "-------------"
        AT 18, 43 PUT "Keyword"
ENDFORM
FORM VALV11
        AT 15, 63 PUT "SEAT MATERIAL*"
        AT 16, 63 PUT "-------------"
        AT 18, 63 PUT "Keyword"
ENDFORM
```

Appendix E: Programs

3. Programs for Printing Completed CREDO Event Forms

CEDRFORM IPF

```
/* procedure file "b:cedrform.ipf" */

/* This procedure makes one continuous form for the CREDO Event */
/* Data Reporting Form and fills it out ready to send to CREDO */

/* put tables used in this procedure into use and load form files */

let e.serr = true
use "b:maint.itb"
use "b:suppform.itb"
use "b:edetiact.itb"
use "b:failured.itb"
use "b:failuref.itb"
use "b:corract.itb"
use "b:maintdat.itb"
use "b:eremarks.itb"
perform "b:event1a.ipf"
perform "b:event2a.ipf"
perform "b:event3a.ipf"
perform "b:event3b.ipf"
perform "b:event4a.ipf"
perform "b:event4b.ipf"
perform "b:event4c.ipf"
perform "b:event4d.ipf"
perform "b:event5a.ipf"
perform "b:event6a.ipf"
perform "b:event7a.ipf"
perform "b:event7b.ipf"
perform "b:event8a.ipf"
perform "b:event9a.ipf"
let e.serr = false

/* set the initial value of the report date and the TSTA Report */
/* Number */

local rdate = 010101
local rptnum = "0"

/* set up a while loop to print more than one form when this */
/* procedure is called */

local another = true
while another do

/* clear the screen and ask the user what the report date is and */
/* which reports they want printed out */

clear
let e.lstr = 80
at 3,18; output "PRINTING A CREDO EVENT DATA REPORTING FORM"
at 4,18; output "-----------------------------------------"
at 8,3; output "What is the report date?"
at 11,10; output "__/__/__"
at 11,10; input rdate using "dd/dd/dd"
at 14,3; output "What is the TSTA Report Number for the Event form that you want
 to print?"
at 15,3; output "(if you don't know the number, input one zero)"
at 17,10; output "____-_"
at 17,10 input rptnum using "dddd-r"

/* if the user doesn't know the TSTA report number, ask them whether */
/* they want to browse MAINT to find the number or to quit this */
/* procedure */

local br = "_" using "r"; local qt = "_" using "r"; local chosen = false
if rptnum = "0    - " then at 20,3; output "Do you want to browse the MAINT table
 to find the Report Number or quit this"
at 21,3; output "procedure? (x your choice; for browsing, press esc when you fin
d the number)"; at 23,10; output "_ browse      _ quit"; let e.lstr = 1; at 23,10
; input br using "r"
if br = "x" then chosen = true; endif; at 23,10; output br; if chosen = false th
en at 23,23; input qt using "r"; if qt = "x" then chosen = true; endif; at 23,27
; output qt; endif; if qt = "x" then return; else browse maint; rptnum = maint.r
eptnumr; endif
endif; let e.lstr = 80

/* obtain the correct record from tables for selected DA Report */
/* Number and the correct record from SUPPFORM for the CREDO ID# on */
/* the report */

let e.supd = true
obtain from maint for reptnumr = rptnum
obtain from edetiact for reptnumr = rptnum
obtain from failured for reptnumr = rptnum
obtain from failuref for reptnumr = rptnum
obtain from corract for reptnumr = rptnum
obtain from maintdat for reptnumr = rptnum
obtain from eremarks for reptnumr = rptnum
credonum = maint.credoid#
obtain from suppform for credoid# = credonum

/* suppress display of CREDO code name */

bob = 1
perform "b:namekey1.ipf"
let e.supd = false

/* set printer values */

let e.pwid = 80
print chr(27)"M",
print chr(27)"3"chr(32),
print chr(27)"l"chr(7),

/* set initial values of local variables for the first part of */
/* this form */

local site = "LANL"
local unit = "TSTA"
```

```
local new = "x"
local chng = "_"
local rrptuor = ""
local rrptoth = ""
local pdate = 010101

/* set the printer page width to 80 */

let e.pwid = 80

/* print the first part of this form (form event1a.ipf) */

print event1a with get

/* print the second part of this form (form event2a.ipf) */

print event2a with get

/* set initial values of local variables for the third part of */
/* this form */

local timedtoa = 0

/* print the third part of this form (form event3a.ipf and form */
/* event3b.ipf) */

print event3a with get
print event3b with get

/* set initial values of local variables for the fourth part of */
/* this form */

local system = "TRITIUM"
local subsyst = "TWT"
local primary = "x"
local secondry = "_"

/* print the fourth part of this form (form event4a.ipf, */
/* event4b.ipf, event4c.ipf, and event 4d.ipf) */

print event4a with get
eject
print event4b with get
print event4c with get
print event4d with get

 /* print the fifth part of this form (form event5a.ipf) */

print event5a with get

/* print the sixth part of this form (form event6a.ipf; no */
/* variables) */

print event6a
```

```
eject

/* print the seventh part of this form (form event7a.ipf and form */
/* event7b.ipf) */

print event7a with get
print event7b with get

/* print the eighth part of this form (form event8a.ipf) */

print event8a with get

/* print the ninth part of this form (form event9a.ipf) */

print event9a

eject

/* return the printer page width to default value of 120 and reset */
/* the printer to its default values */

let e.pwid = 120
print chr(27)"@",

/* clear the screen and ask the user whether they want to print */
/* another form or quit this procedure */

clear
local pr = "_" using "r"; local qt = "_" using "r"; local another = false
at 14,10; output "Do you want to print another form or quit this procedure?"; at
 15,10; output "(x your choice)"; at 17,20; output "_ print another form    _ qui
t"; let e.lstr = 1; at 17,20; input pr using "r"
if pr = "x" then another = true; else pr = "_"; endif; at 17,20; output pr; if a
nother = false then at 17,43; input qt using "r"; at 17,43; output qt; endif; if
 qt = "x" then let e.lstr = 80; return; else continue; endif; let e.lstr = 80
endwhile

return
```

EVENT1A IPF

this procedure called by cedrform.ipf

```
FORM EVENT1A
        AT 1, 22 PUT "CREDO EVENT DATA REPORTING FORM"
        AT 3, 1 PUT "1.  REPORT IDENTIFICATION"
        AT 3, 45 PUT "(a) CREDO Report ID No. _____"
        AT 4, 5 PUT "----------------------"
        AT 6, 5 PUT "(b) Site*  "
        AT 6, 16 GET SITE  STR USING "rrrrrrrr"
        AT 6, 16 PUT SITE  USING "rrrrrrrr"
        AT 6, 30 PUT "(c) Unit*"
        AT 6, 40 GET UNIT  STR USING "rrrrrrrr"
        AT 6, 40 PUT UNIT  USING "rrrrrrrr"
        AT 6, 54 PUT "(d) Report Date"
        AT 6, 70 GET RDATE  NUM USING "dd/dd/dd"
        AT 6, 70 PUT RDATE  USING "dd/dd/dd"
        AT 7, 70 PUT "Mo.Da.Yr."
        AT 9, 5 PUT "(e) Occurrence Title"
        AT 9, 27 GET MAINT.OCCURTIT  STR
        AT 9, 17 PUT MAINT.OCCURTIT  USING "rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr
rrrrrrrrrrrrrrrr"
        AT 11, 5 PUT "(f) Report Status:"
        AT 11, 25 GET NEW  STR USING "r"
        AT 11, 25 PUT NEW  USING "r"
        AT 11, 27 PUT "New"
        AT 11, 34 GET CHNG  STR USING "r"
        AT 11, 34 PUT CHNG  USING "r"
        AT 11, 36 PUT "Change"
        AT 11, 45 PUT "(g) Previous Report Date"
        AT 11, 70 GET PDATE  NUM USING "dd/dd/dd"
        AT 11, 70 PUT PDATE  USING "dd/dd/dd"
        AT 12, 70 PUT "Mo.Da.Yr."
        AT 14, 5 PUT "(h) Related Reports:"
        AT 14, 27 PUT "UOR"
        AT 14, 32 GET RRPTUOR  STR USING "rrrrrrrrrrrrrrrr"
        AT 14, 32 PUT RRPTUOR  USING "rrrrrrrrrrrrrrrr"
        AT 14, 56 PUT "Other"
        AT 14, 63 GET RRPTOTH  STR USING "rrrrrrrrrrrrrrrr"
        AT 14, 63 PUT RRPTOTH  USING "rrrrrrrrrrrrrrrr"
        AT 16, 5 PUT "(i) Event Date "
        AT 16, 21 GET MAINT.EDATE  NUM USING "dd/dd/dd"
        AT 16, 21 PUT MAINT.EDATE  USING "dd/dd/dd"
        AT 16, 36 PUT "Event Time"
        AT 16, 48 GET MAINT.ETIME  NUM USING "dd:dd:dd"
        AT 16, 48 PUT MAINT.ETIME  USING "dd:dd:dd"
        AT 16, 58 PUT "hrs."
        AT 17, 21 PUT "Mo.Da.Yr."
        AT 18, 1 PUT "-------------------------------------------------------------
----------------------"
ENDFORM
```

EVENT2A IPF

this procedure called by cedrform.ipf

```
FORM EVENT2A
        AT 1, 1 PUT "2.  EVENT NARRATIVE"
        AT 4, 5 GET MAINT.DESCRIBE  STR
        AT 4, 5 PUT MAINT.DESCRIBE
        AT 2, 5 PUT "-----------------"
        AT 9, 1 PUT "-------------------------------------------------------------
----------------------"
ENDFORM
```

EVENT3A IPF

this procedure called by cedrform.ipf

```
FORM EVENT3A
        AT 1, 1 PUT "3.  EVENT DETECTION/IMMEDIATE ACTION"
        AT 1, 42 PUT "(a) Det. Date (Mo./Da./Yr.)"
        AT 1, 70 GET MAINT.EDATE  NUM
        AT 1, 70 PUT MAINT.EDATE
        AT 2, 5 PUT "---------------------------------"
        AT 3, 46 PUT "Det. Time"
        AT 3, 57 GET MAINT.ETIME  NUM
        AT 3, 57 PUT MAINT.ETIME
        AT 3, 67 PUT "hrs."
ENDFORM
```

EVENT3B IPF

this procedure called by cedrform.ipf

```
FORM EVENT3B
        AT 2, 5 PUT "(b) Method of Detection*"
        AT 2, 31 GET EDETIACT.DMETHOD  STR USING "rrrrrrrr"
        AT 2, 31 PUT EDETIACT.DMETHOD  USING "rrrrrrrr"
        AT 2, 42 PUT "(c) Time Detection to  "
        AT 2, 65 GET TIMEDTOA  STR USING "rrrrrrrr"
        AT 2, 65 PUT TIMEDTOA  USING "rrrrrrrr"
        AT 3, 46 PUT "Initial Action"
        AT 5, 5 PUT "(d) Operating Status:"
        AT 5, 28 PUT "Unit*"
        AT 5, 35 GET EDETIACT.OSTATUN  STR USING "rrrrrrrr"
        AT 5, 35 PUT EDETIACT.OSTATUN  USING "rrrrrrrr"
        AT 5, 50 PUT "System*"
        AT 5, 59 GET EDETIACT.OSTATSYS  STR USING "rrrrrrrr"
        AT 5, 59 PUT EDETIACT.OSTATSYS  USING "rrrrrrrr"
        AT 7, 28 PUT "Subsystem*"
        AT 7, 40 GET EDETIACT.OSTATSUB  STR USING "rrrrrrrr"
        AT 7, 40 PUT EDETIACT.OSTATSUB  USING "rrrrrrrr"
        AT 9, 5 PUT "(e) Initial (Immediate) Action"
        AT 9, 37 GET EDETIACT.IACTION  STR
        AT 9, 37 PUT EDETIACT.IACTION
        AT 13, 1 PUT "-------------------------------------------------------------------------------
-----------------------"
ENDFORM
```

EVENT4A IPF

this procedure called by cedrform.ipf

```
FORM EVENT4A
        AT 1, 1 PUT "4.  COMPONENT FAILURE DATA"
        AT 2, 5 PUT "----------------------"
        AT 4, 5 PUT "(a) Component Name*"
        AT 4, 26 GET NAME  STR USING "rrrrrrrr"
        AT 4, 26 PUT NAME  USING "rrrrrrrr"
        AT 4, 40 PUT "(b) CREDO ID No.*"
        AT 4, 59 GET CREDONUM  STR USING "rr-dddd-dd"
        AT 4, 59 PUT CREDONUM  USING "rr-dddd-dd"
        AT 6, 5 PUT "(c) Site ID No.*"
        AT 6, 23 GET SUPPFORM.PARAMID#
        AT 6, 23 PUT SUPPFORM.PARAMID#
        AT 6, 38 PUT "(d) System*"
        AT 6, 51 GET SYSTEM  STR USING "rrrrrrrr"
        AT 6, 51 PUT SYSTEM  USING "rrrrrrrr"
        AT 8, 38 PUT "(e) Subsystem*"
        AT 8, 54 GET SUBSYST  STR USING "rrrrrrrr"
        AT 8, 54 PUT SUBSYST  USING "rrrrrrrr"
        AT 10, 5 PUT "(f) Component Description"
        AT 10, 32 GET MAINT.CMPONENT  STR
        AT 10, 32 PUT MAINT.CMPONENT STR
ENDFORM
```

EVENT4B IPF

this procedure called by cedrform.ipf

```
FORM EVENT4B
        AT 1, 5 PUT "(g) Failure Type*"
        AT 1, 24 GET FAILURED.FTYPE  STR USING "rrrrrrrr"
        AT 1, 24 PUT FAILURED.FTYPE  USING "rrrrrrrr"
        AT 1, 37 PUT "(h) Failure Mode*"
        AT 1, 56 GET FAILURED.FMODE  STR USING "rrrrrrrr"
        AT 1, 56 PUT FAILURED.FMODE  USING "rrrrrrrr"
        AT 3, 5 PUT "(i) Failure Cause*"
        AT 3, 25 GET FAILURED.FCAUSE  STR USING "rrrrrrrr"
        AT 3, 25 PUT FAILURED.FCAUSE  USING "rrrrrrrr"
        AT 3, 38 PUT "(j)"
        AT 3, 43 GET PRIMARY  STR USING "r"
        AT 3, 43 PUT PRIMARY  USING "r"
        AT 3, 45 PUT "Primary"
        AT 3, 55 GET SECONDRY  STR USING "r"
        AT 3, 55 PUT SECONDRY  USING "r"
        AT 3, 57 PUT "Secondary"
ENDFORM
```

EVENT4C IPF

this procedure called by cedrform.ipf

```
FORM EVENT4C
        AT 2, 5 PUT "(k) Failure Cause Narrative"
        AT 2, 34 GET MAINT.SPECPROB
        AT 2, 34 PUT MAINT.SPECPROB
ENDFORM
```

EVENT4D IPF

this procedure called by cedrform.ipf

```
FORM EVENT4D
        AT 2, 5 PUT "(l) Failure Effects:"
        AT 2, 27 PUT "System"
        AT 2, 35 GET FAILUREF.FEFFSYS  STR USING "rrrrrrrrrrrrrrrrrrrrrrrrr"
        AT 2, 35 PUT FAILUREF.FEFFSYS  USING "rrrrrrrrrrrrrrrrrrrrrrrrr"
        AT 2, 62 PUT "(Hrs. Lost ="
        AT 2, 75 GET FAILUREF.HRLSTSYS  NUM USING "ddd"
        AT 2, 75 PUT FAILUREF.HRLSTSYS  USING "ddd"
        AT 2, 78 PUT ")"
        AT 4, 27 PUT "Unit"
        AT 4, 33 PUT FAILUREF.FEFFUNIT  USING "rrrrrrrrrrrrrrrrrrrrrrrrr"
        AT 4, 33 GET FAILUREF.FEFFUNIT  STR USING "rrrrrrrrrrrrrrrrrrrrrrrrr"
        AT 4, 62 PUT "(Hrs. Lost ="
        AT 4, 75 GET FAILUREF.HRLSTUN  NUM USING "ddd"
        AT 4, 75 PUT FAILUREF.HRLSTUN  USING "ddd"
        AT 4, 78 PUT ")"
        AT 6, 27 PUT "Other Items Affected"
        AT 6, 49 GET FAILUREF.OTHITAFF  STR USING "rrrrrrrrrrrrrrrrrrrrrrrrrrrrr
r"
        AT 6, 49 PUT FAILUREF.OTHITAFF  USING "rrrrrrrrrrrrrrrrrrrrrrrrrrrrr"
        AT 8, 5 PUT "(m) Critical Parts"
        AT 8, 25 GET FAILUREF.CRITPRTS  STR USING "rrrrrrrrrrrrrrrrrrrrrrrrrrrrr
rrrrrrrrrrrrrrrrrrrrrr"
        AT 8, 25 PUT FAILUREF.CRITPRTS  USING "rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr
rrrrrrrrrrrrrrrrrr"
        AT 10, 1 PUT "-------------------------------------------------------------
-----------------------"
ENDFORM
```

EVENT5A IPF

this procedure called by cedrform.ipf

```
FORM EVENT5A
        AT 1, 1 PUT "5.  CORRECTIVE ACTION"
        AT 1, 30 PUT "(a) Maintenance Action"
        AT 1, 54 GET CORRACT.MNTACTN  STR USING "rrrrrrrr"
        AT 1, 54 PUT CORRACT.MNTACTN  USING "rrrrrrrr"
        AT 2, 5 PUT "-----------------"
        AT 3, 30 PUT "(b) Admin. Action"
        AT 3, 49 GET CORRACT.ADMACTN  STR USING "rrrrrrrr"
        AT 3, 49 PUT CORRACT.ADMACTN  USING "rrrrrrrr"
        AT 5, 5 PUT "(c) Interim"
        AT 5, 18 GET CORRACT.INTERIM  STR
        AT 5, 18 PUT CORRACT.INTERIM
        AT 9, 5 PUT "(d) Final"
        AT 9, 16 GET CORRACT.FINAL  STR
        AT 9, 16 PUT CORRACT.FINAL
        AT 13, 1 PUT "------------------------------------------------------------
---------------------"
ENDFORM
```

EVENT6A IPF

this procedure called by cedrform.ipf

```
FORM EVENT6A
        AT 1, 1 PUT "6.  HUMAN INTERACTION DATA"
        AT 2, 5 PUT "-------------------------"
        AT 4, 5 PUT "(a) Human Initiator?   _ yes   _ no    if yes, explain  __
______________________"
        AT 6, 9 PUT "______________________________________________________________
____________"
        AT 8, 9 PUT "______________________________________________________________
____________"
        AT 10, 5 PUT "(b) Human Interaction/Engineering Potential  ______________
_______________"
        AT 12, 9 PUT "______________________________________________________________
_____________"
        AT 14, 9 PUT "______________________________________________________________
_____________"
        AT 16, 1 PUT "--------------------------------------------------------------
-----------------------"
ENDFORM
```

EVENT7A IPF

this procedure called by cedrform.ipf

```
FORM EVENT7A
        AT 1, 1 PUT "7.  MAINTENANCE DATA"
        AT 2, 5 PUT "-----------------"
        AT 4, 5 PUT "(a) Restoration Time (Hours/Manhours):"
        AT 4, 45 PUT "(i) Total"
        AT 4, 56 GET MAINTDAT.RTIMETOT  NUM USING "dd/dd"
        AT 4, 56 PUT MAINTDAT.RTIMETOT  USING "dd/dd"
        AT 6, 9 PUT "(ii) Administrative"
        AT 6, 30 GET MAINTDAT.RTIMEADM  NUM USING "dd/dd"
        AT 6, 30 PUT MAINTDAT.RTIMEADM  USING "dd/dd"
        AT 6, 40 PUT "(iii) Logistics"
        AT 6, 57 GET MAINTDAT.RTIMELOG  NUM USING "dd/dd"
        AT 6, 57 PUT MAINTDAT.RTIMELOG  USING "dd/dd"
        AT 8, 9 PUT "(iv) Indirect Repair"
        AT 8, 31 GET MAINTDAT.RTIMEIRP  NUM USING "dd/dd"
        AT 8, 31 PUT MAINTDAT.RTIMEIRP  USING "dd/dd"
        AT 8, 41 PUT "(v) Direct Repair"
        AT 8, 60 GET MAINTDAT.RTIMEDRP  NUM USING "dd/dd"
        AT 8, 60 PUT MAINTDAT.RTIMEDRP  USING "dd/dd"
        AT 10, 9 PUT "(vi) Retest"
        AT 10, 22 GET MAINTDAT.RTIMERET  NUM USING "dd/dd"
        AT 10, 22 PUT MAINTDAT.RTIMERET  USING "dd/dd"
        AT 10, 32 PUT "(vii) Restart"
        AT 10, 47 GET MAINTDAT.RTIMERES  NUM USING "dd/dd"
        AT 10, 47 PUT MAINTDAT.RTIMERES  USING "dd/dd"
        AT 12, 5 PUT "(b) Time Since Last"
        AT 12, 26 PUT "(i) Maintenance"
        AT 12, 43 GET MAINTDAT.TSLMAINT  STR USING "rrrrrrrrrr"
        AT 12, 43 PUT MAINTDAT.TSLMAINT  USING "rrrrrrrrrr"
        AT 12, 55 PUT "(ii) Testing"
        AT 12, 69 GET MAINTDAT.TSLTEST  STR USING "rrrrrrrrrr"
        AT 12, 69 PUT MAINTDAT.TSLTEST  USING "rrrrrrrrrr"
ENDFORM
```

EVENT7B IPF

this procedure called by cedrform.ipf

```
FORM EVENT7B
        AT 2, 5 PUT "(c) Maintenace Narrative"
        AT 2, 31 GET MAINT.CORRMNTC  STR
        AT 2, 31 PUT MAINT.CORRMNTC
        AT 8, 1 PUT "-------------------------"
ENDFORM
```

EVENT8A IPF

this procedure called by cedrform.ipf

```
FORM EVENT8A
        AT 1, 1 PUT "8.  REMARKS"
        AT 2, 5 PUT "--------"
        AT 3, 5 GET EREMARKS.REMARKS  STR
        AT 3, 5 PUT EREMARKS.REMARKS
        AT 19, 1 PUT "--------------------------------------------------------------------------------
----------------------"
ENDFORM
```

EVENT9A IPF

this procedure called by cedrform.ipf

```
FORM EVENT9A
        AT 1, 1 PUT "9.  SIGNATURES:     Last Name, initials     Signature
       Site Phone No."
        AT 2, 5 PUT "-----------          -------------------     ---------
   ---------------"
        AT 4, 5 PUT "System Designer  ---------------------   -------------------
   --------------"
        AT 6, 5 PUT "CREDO            ---------------------   -------------------
   --------------"
        AT 10, 1 PUT "TSTA QA Report Number"
        AT 10, 23 GET RPTNUM  STR
        AT 10, 23 PUT RPTNUM  USING "dddd-r"
ENDFORM
```

NAMEKEY1 IPF

This procedure called by cedrform.ipf

```
/* procedure "b:namekey1.ipf" */
/* this file contains the CREDO name code for the TWT components */
/* only.  For the remainder of the codes, see the file */
/* "b:namekey.ipf" */

local dim x(12,3),y(12)
i=1
j=3
while i<=12 do
  x(i,j)="";
  i=i+1;
endwhile
x(1,1)="electric heaters"
x(1,2)="electric heater"
y(1)="eheater"
x(2,1)="filters/strainers"
x(2,2)="filter/strainer"
y(2)="filter"
x(3,1)="gas dryers"
x(3,2)="gas dryer"
y(3)="gasdryer"
x(4,1)="instrument controllers"
x(4,2)="instrument controller"
y(4)="instcntl"
x(5,1)="mechanical pumps"
x(5,2)="mechanical pump"
y(5)="mechpump"
x(6,1)="nonnuclear sensors"
x(6,2)="nonnuclear sensor"
y(6)="nnsensor"
x(7,1)="nuclear detectors"
x(7,2)="nuclear detector"
y(7)="detector"
x(8,1)="pipe and fittings"
x(8,2)="pipe and fitting"
y(8)="pipe"
x(9,1)="pressure vessels and tanks"
x(9,2)="pressure vessel and tank"
x(9,3)="pressure vessels & tanks"
y(9)="pvessel"
x(10,1)="recombiners"
x(10,2)="recombiner"
y(10)="recomb"
x(11,1)="valves"
x(11,2)="valve"
y(11)="valve"
x(12,1)="gas movers"
x(12,2)="gas mover"
y(12)="gasmover"
supp=suppform.suppform
notfound=true
j=1
  while j<=3 do
    i=1
    while notfound and i<=12 do
      if supp=x(i,j) then
        name=y(i);
        notfound=false;
      else
        i=i+1;
      endif
    endwhile
    j=j+1;
  endwhile
return
```

Appendix E: Programs

4. Programs for Printing Blank TSTA Failure and Corrective Maintenance Report Forms

E3D IPF

```
/* procedure e3d.ipf */

/* this procedure controls printing of a blank TSTA Failure and */
/* Corrective Maintenance Report Form (failure portion) */

/* set printer settings for report title */
/*      - printer on; page width=132 for compressed; string=55 */
/*      - indent 22; underline on; compressed print; double strike */

let e.oprn=true
let e.pwid=132
let e.lstr=55
print chr(27)"l"chr(22),
print chr(27)"-1",
print chr(15),
print chr(27)"G",

/* print title */

print "TSTA FAILURE AND CORRECTIVE MAINTENANCE REPORT FORM I"

/* return printer to default settings */

print chr(27)"@",

/* set printer back to compressed mode and print rest of form */

print chr(15),
perform "b:event1.ipf"
print event1
eject

/* set printer setting for second page title */
/*      - indent 45; underline on; double strike */

print chr(27)"l"chr(45),
print chr(27)"-1",
print chr(27)"G",

/* print title */

print "INSTRUCTIONS AND EXPLANATIONS"

/* return printer to default settings */

print chr(27)"@",

/* set printer back to compressed mode and print rest of form */

print chr(15),
perform "b:e3e.ipf"
print e3e

/* turn off compressed mode and return environment variables */
/* for kman back to default values */
```

```
print chr(18),
let e.oprn=false
let e.pwid=120
let e.lstr=15
eject
return
```

EVENT1   IPF

this procedure is called by e3d.ipf

```
FORM EVENT1
        AT 4, 1 PUT "Subsystem"
        AT 4, 11 PUT "____________________"
        AT 4, 34 PUT "Originator"
        AT 4, 46 PUT "____________________________"
        AT 4, 75 PUT "Report Date"
        AT 4, 88 PUT "____/____/____"
        AT 6, 1 PUT "TSTA Parameter No. or Name"
        AT 6, 29 PUT "______________________________________"
        AT 6, 76 PUT "Event Date"
        AT 6, 88 PUT "____/____/____"
        AT 6, 107 PUT "Event Time"
        AT 6, 119 PUT "____:____:____"
        AT 8, 1 PUT "Subsystem Parameters at Time of Failure"
        AT 8, 42 PUT "________________________________________________________________________"
        AT 10, 1 PUT "Subsystem Configuration at Time of Failure"
        AT 10, 45 PUT "_____________________________________________________________________"
        AT 12, 1 PUT "Method of Detection"
        AT 12, 22 PUT "_________________________________________"
        AT 12, 65 PUT "Occurrence Title"
        AT 12, 83 PUT "_______________________________________________________"
        AT 14, 1 PUT "Event Narrative"
        AT 14, 16 PUT "________________________________________________________________________________________"
        AT 16, 1 PUT "_____________________________________________________________________________________________________________"
        AT 18, 1 PUT "_____________________________________________________________________________________________________________"
        AT 20, 1 PUT "_____________________________________________________________________________________________________________"
        AT 22, 1 PUT "Initial (Immediate) Action"
        AT 22, 29 PUT "____________________________________________________________________________"
        AT 24, 1 PUT "************************************************************************************************************************"
        AT 25, 1 PUT "COMPONENT FAILURE DATA"
        AT 25, 31 PUT "(Originator - complete the remainder of this form as full
y as possible)"
        AT 27, 1 PUT "Component Description"
        AT 27, 24 PUT "_____________________________________________________________________________"
        AT 29, 1 PUT "Cause:  Software ___    Personnel ___    Material ___    D
esign ___    Procedure ___"
        AT 29, 90 PUT "Other (Specify) _____________________________"
        AT 31, 1 PUT "Failure Cause Narrative"
        AT 31, 26 PUT "__________________________________________________________________________________"
        AT 33, 1 PUT "_____________________________________________________________________________________________________________"
        AT 35, 1 PUT "Failure Effects:  Subsystem:"
        AT 35, 31 PUT "________________________________________________________________________________________"
        AT 35, 112 PUT "Hours Lost"
        AT 35, 124 PUT "__________"
        AT 37, 19 PUT "Unit:"
        AT 37, 26 PUT "____________________________________________________________________________________"
        AT 37, 112 PUT "Hours Lost"
        AT 37, 124 PUT "__________"
        AT 39, 1 PUT "Other Items Affected:"
        AT 39, 24 PUT "________________________________________________________"
        AT 41, 1 PUT "Proposed Long-Term Corrective Action"
        AT 41, 39 PUT "__________________________________________________________________________________"
        AT 43, 1 PUT "_____________________________________________________________________________________________________________"
        AT 45, 1 PUT "_____________________________________________________________________________________________________________"
        AT 47, 1 PUT "Remarks"
        AT 47, 10 PUT "____________________________________________________________________________________________________"
        AT 49, 1 PUT "_____________________________________________________________________________________________________________"
        AT 51, 1 PUT "_____________________________________________________________________________________________________________"
        AT 53, 1 PUT "_____________________________________________________________________________________________________________"
        AT 55, 1 PUT "TSTA Report Number (filled in by QA)  ________"
ENDFORM
```

this procedure is called by e3d.ipf:

E3E IPF

```
FORM E3E
        AT 4, 2 PUT "1)  Subsystem          - The person who initiates the repor
t specifies the"
        AT 4, 77 PUT "major subsystem involved in the failure."
        AT 6, 2 PUT "2)  Originator         - The person who initiates the repor
t."
        AT 8, 2 PUT "3)  Report Date        - The date that the report is comple
ted."
        AT 10, 2 PUT "4)  TSTA Parameter    - The parameter reading or the name
 of the component"
        AT 10, 78 PUT "that was being examined when the failure was noticed."
        AT 12, 2 PUT "5)  Event Date & Time  - The date and time that the failur
e occurred."
        AT 14, 2 PUT "6)  Occurrence Title   - A very short name for the event,
for example, 'false"
        AT 14, 80 PUT "high alarm'."
        AT 16, 2 PUT "7)  Parameters         - List any displays or readings tha
t might be helpful"
        AT 16, 79 PUT "in determining what was happening at the time of the"
        AT 17, 27 PUT "failure."
        AT 19, 2 PUT "8)  Configuration      - List the operating status of the
subsystem when the"
        AT 19, 79 PUT "failure occurred."
        AT 21, 2 PUT "9)  Event Narrative    - Give a short description of exact
ly what happened,"
        AT 21, 78 PUT "any symptoms noticed before, during, or after the"
        AT 22, 27 PUT "failure, and the cause of the failure if you know."
        AT 24, 1 PUT "10)  Initial Action    - Give a short description of the
immediate action"
        AT 24, 76 PUT "taken to take care of the problem."
        AT 26, 1 PUT "**********************************************************
**********************************************************************"
        AT 27, 1 PUT "The remainder of the form is to be filled out if the infor
mation requested is"
        AT 27, 79 PUT "known at the time of the failure."
        AT 29, 1 PUT "11)  Component          - Indicate the specific component
that failed."
        AT 31, 1 PUT "12)  Cause              - Check the area that best describ
es what the cause of"
        AT 31, 80 PUT "the problem really was."
        AT 33, 1 PUT "13)  Failure Cause Nar. - Specify exactly what the problem
 was."
        AT 35, 1 PUT "14)  Failure Effects    - Specify the effects of the failu
re on the subsystem and the time lost because of the failure."
        AT 36, 6 PUT "- Subsystem"
        AT 38, 1 PUT "15)  Failure Effects    - Specify the effects of the failu
re on TSTA and the process loop down time because of the failure."
        AT 39, 6 PUT "- Unit, time"
        AT 41, 1 PUT "16)  Failure Effects    - Specify other items affected and
 the time lost"
        AT 41, 74 PUT "because of the failure."
        AT 42, 6 PUT "- Other Items"
        AT 44, 1 PUT "17)  Corrective Action  - Specific suggestions to avoid re
currence of the"
        AT 44, 75 PUT "failure, including suggested procedural changes or change
s"
        AT 45, 27 PUT "in equipment."
        AT 47, 1 PUT "18)  Remarks            - Self explanatory."
ENDFORM
```

EVENT3 IPF

```
/* procedure event3.ipf */

 * this procedure controls printing of a blank TSTA Failure and */
 * Corrective Maintenance Report Form (maintenance portion) */

/* set printer settings for report title */
/*      - printer on; page width=132 for compressed; string=55 */
/*      - indent 22; underline on; compressed print; double strike */

let e.oprn=true
let e.pwid=132
let e.lstr=55
print chr(27)"l"chr(22),
print chr(27)"-1",
print chr(15),
print chr(27)"G",

/* print title */

print "TSTA FAILURE AND CORRECTIVE MAINTENANCE REPORT FORM II"

/* return printer to default settings */

print chr(27)"@",

/* set printer back to compressed mode and print rest of form */

print chr(15),
perform "b:e3b.ipf"
print e3b
eject

/* set printer setting for second page title */
/*      - indent 45; underline on; double strike */

print chr(27)"l"chr(45),
print chr(27)"-1",
print chr(27)"G",

/* print title */

print "INSTRUCTIONS AND EXPLANATIONS"

/* return printer to default settings */

print chr(27)"@",

/* set printer back to compressed mode and print rest of form */

print chr(15),
perform "b:e3c.ipf"
print e3c

/* turn off compressed mode and return environment variables */
/* for kman back to default values */
print chr(18),
let e.oprn=false
let e.pwid=120
let e.lstr=15
eject
return
```

E3B IPF

this procedure is called by event3.ipf

```
FORM E3B
        AT 4, 1 PUT "TSTA Report Number (filled in by QA) ________"
        AT 4, 62 PUT "Corrective Action Taken: Corrected by TSTA Operational Per
sonnel ___"
        AT 5, 87 PUT "Corrected by TSTA Repair/Design Personnel ___"
        AT 6, 87 PUT "Other (Specify) _____"
        AT 9, 1 PUT "Failed Component _____"
        AT 9, 59 PUT "Serial Number _____"
        AT 9, 100 PUT "Model Number _____"
        AT 11, 1 PUT "Critical Part(s) _____
_____"
        AT 13, 1 PUT "Problem with Component: Electrical ___ Mechanical __
_ Software ___"
        AT 13, 80 PUT "Other (Specify) _____"
        AT 15, 1 PUT "Describe Corrective Maintenance Taken to Correct Failure
_____"
        AT 17, 1 PUT "_____
_____"
        AT 19, 1 PUT "_____
_____"
        AT 21, 1 PUT "_____
_____"
        AT 23, 1 PUT "_____
_____"
        AT 25, 1 PUT "Special Maintenance Equipment Required _____
_____"
        AT 27, 1 PUT "_____
_____"
        AT 29, 1 PUT "Time Required for Component Repair/Replacement (hours/man
hours)  (i) Total ____/____  (ii) Administrative ____/____"
        AT 31, 1 PUT "(iii) Logistics ____/____  (iv) Indirect Repair ____/
____  (v) Direct Repair ____/____  (vi) Retest ____/____"
        AT 33, 1 PUT "(vii) Restart ____/____"
        AT 35, 1 PUT "Time Since Last  (i) Maintenance _____
  (ii) Testing _____"
        AT 39, 32 PUT "Unusual Circumstances Causing Long or Short Repair/Replac
ement Time:"
        AT 41, 1 PUT "Assessibility ___  Size and Weight of Component ___
  Connections ___  Contamination ___  (Level _____)"
        AT 41, 86 PUT "Contamination ___ (Level _____)  "
        AT 43, 1 PUT "Other (Specify) _____
_____"
        AT 45, 1 PUT "Method Used for Verification of System Operational Status
_____"
        AT 47, 1 PUT "_____
_____"
        AT 49, 1 PUT "_____
_____"
        AT 54, 1 PUT "Corrective Action Completed On ____/____/____  By ___
_____"
ENDFORM
```

E3C IPF

this procedure is called by event3.ipf

```
FORM E3C
        AT 4, 1 PUT "This part of the form is to be filled out at the time corre
ctive action is taken to correct the failure.  If the person that filed"
        AT 5, 1 PUT "the report is going to perform the maintenance then he will
ll be responsible for filling out the entire report form.  If the equip"
        AT 6, 1 PUT "ment is removed by TSTA personnel and sent out for repair,
then the personnel that pulled the equipment are responsible for filling"
        AT 7, 1 PUT "out everything except the section describing the corrective
 action taken to correct the failure.  The subsystem designers will be"
        AT 8, 1 PUT "responsible for finding out what action was taken to fix th
e equipment and filling out the description of corrective maintenance."
        AT 11, 2 PUT "1)  Action Taken          - Check the appropriate line or de
scribe who took the corrective action."
        AT 13, 2 PUT "2)  Component             - Indicate the specific component
that failed."
        AT 15, 2 PUT "3)  Critical Part(s)      - Specify which piece(s) of the co
mponent failed."
        AT 17, 2 PUT "4)  Serial Number         - List the serial number of the fa
iled component if applicable."
        AT 19, 2 PUT "5)  Model Number          - List the model number of the fai
led component if applicable."
        AT 21, 2 PUT "6)  Problem               - Fill in what the basic problem w
as.  If you use the \"other\" category, be as specific as possible."
        AT 23, 2 PUT "7)  Description           - Give a brief description of what
 was done to the failed component in order to bring it back to its "
        AT 24, 28 PUT "pre-failure state.  If the equipment needed to be replace
d then give the reasons."
        AT 26, 2 PUT "8)  Special Equipment     - List any special tools or equipm
ent needed to repair or replace the failed component."
        AT 28, 2 PUT "9)  Time Required         - Give an estimation of the time i
t took to fix the failed component.  Identify specific category of time"
        AT 29, 28 PUT "expenditure if possible."
        AT 31, 1 PUT "10)  Circumstances        - Check the appropriate line if a
ny of the listed items caused any problems while you were trying to "
        AT 32, 28 PUT "correct the failure.  If contamination was a factor then
list the approximate level of contamination"
        AT 33, 28 PUT "you were dealing with."
        AT 35, 1 PUT "11)  Verification         - List the method used to make su
re that the component would operate properly before involving the entire"
        AT 36, 28 PUT "system.  List any test plans, calibration procedures, etc
., that were used in the verification."
        AT 38, 1 PUT "12)  Completed            - Give the date that the correcti
on action was completed."
        AT 40, 1 PUT "13)  By                   - Signature of the person who ver
ified that corrective action was completed."
ENDFORM
```

Appendix E: Programs

5. Programs for Printing Completed CREDO Operating Data Report Forms

CODRFORM IPF

```
/* procedure file "b:codrform.ipf" */

/* This procedure makes one continuous form for the CREDO Operating */
/* Data Reporting Form and fills it out ready to send to CREDO */

/* put tables used in this procedure into use and load form files */

let e.serr = true
use "b:reportid.itb"
use "b:optimes.itb"
use "b:availdat.itb"
perform "b:opdat1.ipf"
perform "b:opdat2.ipf"
perform "b:opdat3.ipf"
let e.serr = false

/* set the initial value of the report date and the tstaopnum */

local rdate = 010101
tstaopnum = "0"

/* set up a while loop to print more than one form when this */
/* procedure is called */

local another = true
while another do

/* clear the screen and ask the user what the report date is and */
/* which records they want printed out */

clear
let e.lstr = 80
at 3,18; output "PRINTING A CREDO OPERATING DATA REPORTING FORM"
at 4,18; output "-----------------------------------------------"
at 8,3; output "What is the report date?"
at 11,10; output "__/__/__"
at 11,10; input rdate using "dd/dd/dd"
at 14,3; output "What is the TSTA Operating Data Report Number that you want to
print"
at 15,3; output "a data form for?"
at 15,20; output "(if you don't know the number, enter one zero)"
at 17,10; output "____"
at 17,10; input tstaopnum using "dddd"

/* if the user doesn't know the TSTA Operating Data Report Number */
/* ask them whether they want to browse REPORTID to find the number */
/* or quit this program */

local br = "_" using "r"; local qt = "_" using "r"; local chosen = false
if tstaopnum = "0" then at 20,3; output "Do you want to browse the REPORTID tabl
e to find the Report Number or quit"
at 21,3; output "this procedure? (x your choice; for browsing, press esc when yo
u find the"
at 22,3; output "number)"
at 23,10; output "_ browse      _ quit"; let e.lstr = 1; at 23,10; input br using
 "r"
if br = "x" then chosen = true; else br = "_"; endif; at 23,10; output br; if ch
osen = false then at 23,23; input qt using "r"; if qt = "x" then chosen = true;
else qt = "_"; endif; at 23,23; output qt; endif; if qt = "x" then return
else browse reportid; tstaopnum = reportid.tstaop#; endif; endif; let e.lstr = 8
0

/* set values of local variables */

local site = "LANL"
local unit = "TSTA"

/* obtain correct record from each table for selected TSTA Report */
/* Number */

let e.supd = true
obtain from reportid for tstaop# = tstaopnum
obtain from optimes for tstaop# = tstaopnum
obtain from availdat for tstaop# = tstaopnum
let e.supd = false

/* set print values */

let e.pwid = 80
print chr(27)"M",
print chr(27)"3"chr(32),
print chr(27)"l"chr(7),

/* print the first part of this form (form opdat1.ipf) */

print opdat1 with get

/* print the second part of this form (form opdat2.ipf) */

print opdat2 with get

/* print the third part of this form (form opdat3.ipf) */

print opdat3 with get

eject

/* return the printer page width to default value of 120 and reset */
/* the printer to default values */

let e.pwid = 120
print chr(27)"@",

/* clear the screen and ask the user whether they want to print */
/* another form or quit this procedure */

clear
local pr = "_" using "r"; local q = "_" using "r"; local another = false
at 14,10; output "Do you want to print another form or quit this procedure?"; at
 15,10; output "(x your choice)"; at 17,20; output "- print another form    _ qui
t"; let e.lstr = 1; at 17,20; input pr using "r";
```

```
if pr = "x" then another = true; else pr = "_"; endif; at 17,20; output pr; if a
nother = false then at 17,43; input qt using "r"; at 17,43; output qt; endif
if qt = "x" then let e.lstr = 80; return; else continue; endif; let e.lstr = 80
endwhile

return
```

UPDAT1 IPF

```
FORM OPDAT1
        AT 1, 23 PUT "CREDO OPERATING DATA REPORTING FORM"
        AT 3, 1 PUT "1.  REPORT IDENTIFICATION"
        AT 3, 45 PUT "(a) CREDO Report ID No. _____"
        AT 4, 5 PUT "----------------------"
        AT 6, 5 PUT "Site*"
        AT 6, 12 GET SITE  STR
        AT 6, 12 PUT SITE
        AT 6, 32 PUT "Unit*"
        AT 6, 39 GET UNIT  STR
        AT 6, 39 PUT UNIT
        AT 6, 59 PUT "Report Date"
        AT 6, 72 GET RDATE  STR USING "dd/dd/dd"
        AT 6, 72 PUT RDATE  USING "dd/dd/dd"
        AT 7, 72 PUT "Mo.Da.Yr."
        AT 9, 5 PUT "Report Period Start Date"
        AT 9, 31 GET REPORTID.RPERSTRT  STR USING "dd/dd/dd"
        AT 9, 31 PUT REPORTID.RPERSTRT  USING "dd/dd/dd"
        AT 9, 48 PUT "Report Period End Date"
        AT 9, 72 GET REPORTID.RPEREND  STR USING "dd/dd/dd"
        AT 9, 72 PUT REPORTID.RPEREND  USING "dd/dd/dd"
        AT 10, 31 PUT "Mo.Da.Yr."
        AT 10, 72 PUT "Mo.Da.Yr."
        AT 11, 1 PUT "------------------------------------------------------------
----------------------"
ENDFORM
```

OPDAT2 IPF

```
FORM OPDAT2
        AT 1, 1 PUT "2.  OPERATING TIMES (HOURS)"
        AT 2, 5 PUT "-------------------------"
        AT 4, 5 PUT "MODE-1                  Normal Operations"
        AT 4, 57 GET OPTIMES.NORMALOP  NUM
        AT 4, 57 PUT OPTIMES.NORMALOP
        AT 4, 74 PUT "Hour(s)"
        AT 6, 5 PUT "MODE-2                  Limited Operations"
        AT 6, 57 GET OPTIMES.LIMITEDO  NUM
        AT 6, 57 PUT OPTIMES.LIMITEDO
        AT 6, 74 PUT "Hour(s)"
        AT 8, 5 PUT "MODE-3                  Shutdown Operations"
        AT 8, 57 GET OPTIMES.SHUTDOWN  NUM
        AT 8, 57 PUT OPTIMES.SHUTDOWN
        AT 8, 74 PUT "Hour(s)"
        AT 9, 1 PUT "--------------------------------------------------------------
--------------------"
        AT 11, 1 PUT "3.  NUMBER CREDO EVENT REPORTS THIS REPORTING PERIOD FOR T
HIS UNIT:"
        AT 11, 70 GET OPTIMES.NUMEVENT  NUM USING "dddddddddd"
        AT 11, 70 PUT OPTIMES.NUMEVENT  USING "dddddddddd"
        AT 13, 1 PUT "--------------------------------------------------------------
--------------------"
ENDFORM
```

OPDAT3 IPF

```
FORM OPDAT3
        AT 1, 1 PUT "4.  FACILITY AVAILABILITY DATA"
        AT 2, 5 PUT "-------------------------------"
        AT 3, 43 PUT "Authorized Output"
        AT 4, 5 PUT "Design Output**"
        AT 4, 22 GET AVAILDAT.DESOUT  STR USING "rrrrrrrrrrrrrr"
        AT 4, 22 PUT AVAILDAT.DESOUT  USING "rrrrrrrrrrrrrr"
        AT 4, 43 PUT "This Report Period**  "
        AT 4, 65 GET AVAILDAT.AUTHOUT  STR USING "rrrrrrrrrrrrrr"
        AT 4, 65 PUT AVAILDAT.AUTHOUT  USING "rrrrrrrrrrrrrr"
        AT 6, 5 PUT "Report Period Total Output**"
        AT 6, 35 GET AVAILDAT.TOTOUT  STR USING "rrrrrrrrrrrrrr"
        AT 6, 35 PUT AVAILDAT.TOTOUT  USING "rrrrrrrrrrrrrr"
        AT 8, 5 PUT "Outages:"
        AT 8, 38 PUT "Number"
        AT 8, 53 PUT "Hours Expended"
        AT 10, 15 PUT "Scheduled"
        AT 10, 39 GET AVAILDAT.SCHOUT#  NUM
        AT 10, 39 PUT AVAILDAT.SCHOUT#
        AT 10, 51 GET AVAILDAT.SCHOUTHR  NUM
        AT 10, 51 PUT AVAILDAT.SCHOUTHR
        AT 12, 15 PUT "Unscheduled"
        AT 12, 39 PUT AVAILDAT.UNSOUT#
        AT 12, 39 GET AVAILDAT.UNSOUT#
        AT 12, 51 GET AVAILDAT.UNSOUTHR  NUM
        AT 12, 51 PUT AVAILDAT.UNSOUTHR
        AT 14, 5 PUT "Comments/Discussion"
        AT 16, 5 GET AVAILDAT.COMMENTS  STR
        AT 16, 5 PUT AVAILDAT.COMMENTS
        AT 18, 5 PUT "For Test Facilities:"
        AT 20, 15 PUT "Number of Transients or Cycles This Period"
        AT 20, 65 GET AVAILDAT.TRCYC#  NUM
        AT 20, 65 PUT AVAILDAT.TRCYC#
        AT 22, 15 PUT "Total Hours at Transient or Cyclic Conditions"
        AT 22, 62 GET AVAILDAT.TRCYCHR  NUM
        AT 22, 62 PUT AVAILDAT.TRCYCHR
        AT 23, 1 PUT "--------------------------------------------------------------
--------------------"
        AT 24, 1 PUT "5.  SIGNATURES:      Last Name, Initials     Signature
        Site Phone No."
        AT 25, 5 PUT "----------       ------------------     ---------
    ---------------"
        AT 27, 5 PUT "System Designer"
        AT 27, 22 PUT "___________________   _________________   __________
__"
        AT 29, 5 PUT "CREDO                 ____________________   ______________
_   ______________"
        AT 32, 1 PUT "TSTA Operating Data Report Number"
        AT 32, 36 GET TSTAOP#  STR USING "dddd"
        AT 32, 36 PUT TSTAOP#  USING "dddd"
ENDFORM
```

Appendix E: Programs

6. Programs for Printing Blank CREDO Operating Data Report Forms

BLANKOP IPF

```
/* procedure blankop.ipf */

/* this procedure controls printing of a blank CREDO Operating */
/* Data form.  The procedure codrform.ipf is used for printing */
/* completed forms */

/* set the printer up to print the form */

let e.pwid=80
let e.pdep=63
print chr(27)"M",
print chr(27)"3"chr(32),
print chr(27)"l"chr(7),

FORM BLANKOP
        AT 1, 23 PUT "CREDO OPERATING DATA REPORTING FORM"
        AT 3, 1 PUT "1.  REPORT IDENTIFICATION"
        AT 3, 45 PUT "(a) CREDO Report ID No. ____________"
        AT 4, 5 PUT "----------------------"
        AT 6, 5 PUT "Site*"
        AT 6, 12 PUT "__________________"
        AT 6, 32 PUT "Unit*"
        AT 6, 39 put "__________________"
        AT 6, 59 PUT "Report Date"
        AT 6, 72 put "__/__/__"
        AT 7, 72 PUT "Mo.Da.Yr."
        AT 9, 5 PUT "Report Period Start Date"
        AT 9, 31 PUT "__/__/__"
        AT 9, 48 PUT "Report Period End Date"
        AT 9, 72 PUT "__/__/__"
        AT 10, 31 PUT "Mo.Da.Yr."
        AT 10, 72 PUT "Mo.Da.Yr."
        AT 11, 1 PUT "-------------------------------------------------------------
----------------------"
        AT 12, 1 PUT "2.  OPERATING TIMES (HOURS)"
        AT 13, 5 PUT "------------------------"
        AT 15, 5 PUT "MODE-1              Normal Operations"
        AT 15, 57 PUT "_____________________"
        AT 15, 74 PUT "Hour(s)"
        AT 17, 5 PUT "MODE-2              Limited Operations"
        AT 17, 57 PUT "_____________________"
        AT 17, 74 PUT "Hour(s)"
        AT 19, 5 PUT "MODE-3              Shutdown Operations"
        AT 19, 57 PUT "_____________________"
        AT 19, 74 PUT "Hour(s)"
        AT 21, 1 PUT "-------------------------------------------------------------
----------------------"
        AT 22, 1 PUT "3.  NUMBER CREDO EVENT REPORTS THIS REPORTING PERIOD FOR T
HIS UNIT:"
        AT 22, 70 PUT "__________"
        AT 24, 1 PUT "-------------------------------------------------------------
----------------------"
        AT 25, 1 PUT "4.  FACILITY AVAILABILITY DATA"
        AT 26, 5 PUT "--------------------------"
        AT 28, 43 PUT "Authorized Output"
        AT 28, 5 PUT "Design Output**"
        AT 28, 22 PUT "________________"
        AT 28, 43 PUT "This Report Period**
        AT 28, 65 PUT "________________"
        AT 30, 5 PUT "Report Period Total Output**"
        AT 30, 35 PUT "________________"
        AT 32, 5 PUT "Outages:"
        AT 32, 38 PUT "Number"
        AT 32, 53 PUT "Hours Expended"
        AT 34, 15 PUT "Scheduled"
        AT 34, 34 PUT "_______________"
        AT 34, 53 PUT "_______________"
        AT 36, 15 PUT "Unscheduled"
        AT 36, 34 PUT "_______________"
        AT 36, 53 PUT "_______________"
        AT 38, 5 PUT "Comments/Discussion"
        AT 38, 25 PUT "_____________________________________________________________
        AT 40, 5 PUT "-------------------------------------------------------------
--------------------"
        AT 42, 5 PUT "For Test Facilities:"
        AT 44, 15 PUT "Number of Transients or Cycles This Period"
        AT 44, 65 PUT "_____________"
        AT 46, 15 PUT "Total Hours at Transient or Cyclic Conditions"
        AT 46, 65 PUT "_____________"
        AT 48, 1 PUT "-------------------------------------------------------------
------------------------"
        AT 49, 1 PUT "5.  SIGNATURES:      Last Name, Initials     Signature
        Site Phone No."
        AT 50, 5 PUT "----------       ------------------      ---------
    --------------"
        AT 52, 5 PUT "System Designer"
        AT 52, 22 PUT "____________________  ________________  __________
__"
        AT 54, 5 PUT "CREDO                ____________________  ____________
_  ____________"
        AT 58, 1 PUT "TSTA Operating Data Report Number"
        AT 58, 36 PUT "________"
ENDFORM

print blankop

/* return printer to default values */

let e.pwid=120
let e.pdep=60
print chr(27)"@",
return
```