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CONVERSION, INTEGRATION, AND MAINTENANCE
ISSUES OF NAVY
STOCK POINTS EXPERT SYSTEMS

by

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The Naval Postgraduate School has developed a number of small expert system prototypes for the Naval Supply Systems Command (NAVSUP) to automate some functions in inventory management. These expert systems were developed during the last several years to aid inventory managers at Navy Stock Points. Several thesis students have successfully developed three separate standalone functioning and employable systems which run on MS-DOS based machines, and which use different knowledge representation approaches and different programming languages. Since these prototypes gave been built, new expert system shells have become available. Because of advances in technology and the drive toward integration today, integration of these prototypes is important to enhance man-machine interface, increase system performance, and facilitate maintenance tasks. This thesis addresses the generic requirements needed to convert, integrate, and maintain the rule bases of three standalone expert systems and combine them into one functioning integrated expert system. It then provides such a system in a VP-Expert shell and describes the specific details of the conversion effort. Improvements needed are also discussed.

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Issues of Navy
Stock Points Expert Systems

by

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ABSTRACT

The Naval Postgraduate School has developed a number of small expert system prototypes for the Naval Supply Systems Command (NAVSUP) to automate some functions in inventory management. These expert systems were developed to aid the inventory managers at Navy Stock Points during the last several years. Several thesis students have successfully developed three separate stand-alone functioning and employable systems which run on MS-DOS based machines and which use different knowledge representation approaches and different programming languages. Since these prototypes were built, new expert systems shells have become available. Because of advances in technology and the drive toward integration today, integration of these prototypes is important to enhance man-machine interface, increase system performance, and facilitate maintenance tasks. This thesis addresses the generic requirements needed to convert, integrate and maintain the rule bases of three stand-alone expert systems and combine them into one functioning integrated expert system. It then provides such a system in a VP-EXPERT shell and describes the specific details of the conversion effort. Improvements needed are also discussed.

TABLE OF CONTENTS

I. INTRODUCTION

A. AREA OF RESEARCH

A number of small expert system prototypes have been developed at the Naval Postgraduate School (NPS) during the last several years for the Naval Supply Systems Command (NAVSUP) to facilitate some of the functions in inventory management. These expert systems were developed to aid the inventory managers at Navy Stock Points during the last several years. Through the support and guidance of NPS faculty members well versed in expert systems design and inventory management, several thesis students have successfully developed three functioning and employable systems. These routines run on MS-DOS based machines and were built as stand-alone systems using different knowledge representation approaches and different programming languages. Each of these three systems represents a significant segment of an expert's knowledge base, and provides the user with a subset of the total knowledge domain. Integration issues arise because two of the three systems are written in M.1, an expert system shell, and the other is written in PROLOG. Although not all inclusive, the composite effort embodied by the three expert systems facilitates three major tasks that an inventory manager at a Navy stock point is expected to perform.

Since these prototypes were built, new expert systems shells have become available. It was therefore considered important to convert these prototypes to the enhance man-machine interface, improve system performance, and facilitate maintenance tasks. The assimilation of the three separate systems into one package will provide such a manager

with a variety of computerized expertise under a shared, unique, and expandable interface.

B. OBJECTIVE

The objective of the research presented in this thesis was to convert the three stand-alone expert systems into one functioning integrated expert system. It also attempted to improve the quality of the user interface and reduce the maintenance requirements.

C. RESEARCH QUESTIONS

The thesis explores the following questions: Can an integrated expert system be developed and implemented that incorporates three existing expert systems developed under different environments? What are specific issues to consider in converting and maintaining an Integrated Stock Points Management Expert System? What is the best interaction mode with Stock Point inventory managers to enhance man-machine interface?

D. SCOPE OF RESEARCH

The scope of this thesis encompasses the small-scale conversion, integration and maintenance of three separate but interrelated rule-based expert systems into one. This integration also attempts to provide a generic framework to aliow for incorporation of future rule bases.

E. RESEARCH METHODOLOGY

Without an adequate strategy for planning and conducting the conversion, a great deal of resources could be wasted. The methodology consists of the following steps: conduct an analysis of the source and target languages, choose a target language, select

a tool for editing the source code, develop an integration strategy, complete the conversion of all rule bases, test the individual rule bases, implement the integrated system strategy, and test, evaluate, and iteratively refine the system.

F. ORGANIZATION OF THE THESIS

Chapter II discusses the previous work that has been done in the area of expert systems research and development for NAVSUP. It provides a discussion of lessons learned in the systems' development, conclusions, and recommendations from earlier work.

Chapter III explores the theoretical issues involved in maintenance, conversion, and prototyping.

Chapter IV introduces the expert system shell, VP-EXPERT, and examines the applicability of the theoretical issues discussed in Chapter III. The chapter then describes the conversion guidelines that were followed to implement the integrated system, the Integrated Inventory Management Expert System architecture, and how to use the new system under VP-EXPERT.

Chapter V completes the thesis with a summary and conclusions about the research, and recommendations for future work.

Appendix A is a series of screen "snapshots" that demonstrates a sample consultation. The consultation shows the Integrated Inventory Management Expert System's opening menus, and a session using the Causative Research expert system. This appendix is provided to give the reader an example of one possible way that VP-EXPERT can interact with the user, and to show how the integrated concept prototype was actually implemented.

Appendix B is a listing of the converted rule bases, and all program code. This is provided for the reader who wishes to gain an understanding of the program structure as implemented in VP-EXPERT, or who wishes to conduct maintenance on the code.

Appendix C provides a listing of the help file used by the integrated system. Since construction of help files is simple in VP-EXPERT, the help file contents are provided to show the reader what type of information can be stored in this type of file. The contents of this file represent some instructions to the user, data dictionaries (documents that define data used in a system), and a glossary.

II. SUMMARY AND DISCUSSION OF PREVIOUS WORK

A. DESCRIPTION AND HISTORY OF INVENTORY MANAGEMENT EXPERT SYSTEMS

This chapter deals with a review of previous work and its significance to the conversion effort that was undertaken in this thesis. Figure 1 provides a summary status of previous and present work.

Prior to the development of the first expert system prototype in 1987, LCDR Gary Westfall established a set of decision rules upon which to base an expert system for resolving the problem of delinquent (unfilled) resupply requisitions sent by a Navy Stock Point to the Defense Logistics Agency (DLA). These requisitions are known as Delinquent Dues [Ref. 1].

The first of the Naval Postgraduate School expert systems for Stock Points was completed by LT William Schill in March 1987, using the decision rules established by Westfall. The system consisted of two programs, Delinquent Dues and Variable Ranking Lists [Ref. 2: p. 9]. Schill explains that "Variable Ranking Lists are quarterly outputs that provide a mechanized screening and highlighting of situations requiring inventory managers' review." The programs were written in PROLOG which, although efficient, can be a difficult language for most people to learn and use. Schill's thesis provides a listing of the code used to implement the system. However, there is little documentation to assist any individual wishing to make changes or modify the existing prototype. There is also very little in the way of help or explanation facilities. His documentation is often cryptic and of little practical use to the end user [Ref. 2: p. 35].

DATE	AUTHOR	REMARKS
Dec 1986	Westfall	Developed a set of decision rules for development of an expert system for resolving Delinquent Dues.
Mar 1987	Schill	Completed the first prototype expert system using Westfall's decision rules. The system consisted of two rule bases called Variable Ranking Lists and Delinquent Dues, written in PROLOG. The system was not very user-friendly.
Mar 1988	Potwin	Developed the second prototype expert system consisting of the rule base called Dues Management. This program incorporated the Delinquent Dues code written by Schill, and included Potwin's enhancement to that code. It also added the capability of System Cancellations. It was written in M.1 and the system was much more user-friendly than the previous version of Delinquent Dues.
Jun 1988	Dolan and Ellison	Developed the third prototype expert system consisting of the rule base called Causative Research. This program was separate from but related to the previous work. Code was written in M.1.
Mar 1990	England	Developed a rule base for a Hazardous Material expert system that was incorporated into the integrated system. The rule base was developed and written in VP-EXPERT by LCDR England, who was still enhancing the code at the time the rule base was included in the integrated system.
Mar 1990	Rouska	Converted the following expert systems programs into the expert system shell, VP-EXPERT: Variable Ranking Lists, Dues Management, and Causative Research. Developed an application in VP-EXPERT that allows the user to run these three rule bases and the Hazardous Materials rule base from one screen. Sought to enhance maintainability and improve the user interface. The integration routine contained code to easily allow for the addition of future rule bases. The integrated system also included a basic help file written in VP-EXPERT hypertext.

Figure 1. Summary of Expert System Development at NPS

In March 1988, CAPT Albert Potwin, another student at NPS, designed a second expert system which was meant to assist inventory managers at retail Stock Points in the field of Dues Management. His expert system consists of two modules (stored as one rule base) which he calls Delinquent Dues and System Cancellations [Ref. 3: p. iii]. Potwin explains that "System cancellations occur when the supply source that the document was passed to, rejects the requisition for a reason specified in the cancellation status." [Ref.3: p. 27]. To process a cancellation, the inventory manager must gather relevant information and decide how to resolve it. [Ref. 3: p. 28].

He continued Schill's work and converted Schill's Delinquent Dues program into M.1, a rule based expert system shell made by Teknowledge. Potwin did not address the Variable Ranking Lists in his work. After converting and modifying Schill's Delinquent Dues program, Potwin added the System Cancellations module [Ref. 3: p. 23]. The documentation provided in his thesis is considerably more comprehensive, compared to Schill's work, and he provides test examples of the different runs obtained from the system.

In June 1988, LCDRs William Dolan and James Ellison developed the third expert system prototype consisting of the rule base called Causative Research [Ref. 4: p. 4]. Causative Research is a detailed inquiry which seeks to identify those factors which cause inventory inaccuracies and determines the correct entries for bringing the stock records in line with actual physical counts of items in their particular locations [Ref. 4: pp.7-8]. This program is a separate expert system, but is related to the previous work in that all three stand-alone systems represent various tasks performed by Navy inventory managers at Retail Stock Points. This system was also written in M.1.

In March 1990, LCDR David England, another NPS student, had completed work on a Hazardous Materials expert system. The Hazardous Materials expert system addresses the handling and disposal of hazardous materials. He noted that this system was designated to be used in Supply warehouses, where it would be very useful [Ref. 5]. This expert system was incorporated into the Integrated Inventory Management Expert System to demonstrate that as the number of expert system applications grow, they can be easily added as modules to the integrated system.

B. CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE EXPANSION

This section summarizes the conclusions and recommendations of the developers of the three stand-alone expert system prototypes. In his summary, Schill felt that automating some inventory manager tasks could increase their productivity. His experience indicated that his Delinquent Dues program provide some inaccurate conclusions, and his two expert system programs were not too helpful to the user. Schill concluded that the result of his work should encourage the development of future inventory management expert systems [Ref. 2: pp. 42-43].

Schill recommended that extensive testing and evaluation of his prototypes be conducted to determine validity in all cases. After needed changes were made, he proposed that training and tutoring of inexperienced inventory management personnel in the use of the system and incorporation of external data sources be implemented [Ref. 2: p. 44] . Incorporation of external data sources referred to interfacing the Stock Points' automated data processing system (known as the Uniform Automated Data Processing System for Stock Points or UADPS-SP, a mainframe system) with his expert system [Ref.

2: p. 7]. Finally, Schill recommended that other areas of inventory management be examined for inclusion in an aggregate expert system [Ref. 2: p. 45].

Potwin's thesis continued and revised the Delinquent Dues prototype developed by Schill. He did not address the Variable Ranking Lists prototype. Potwin converted Schill's code in Delinquent Dues to M.1 and added the retail inventory management's process of handling system cancellations [Ref. 3: p. 4].

Potwin concluded that the quality of the user interface of M.1 far exceeded that of PROLOG's. He felt that maintaining and enhancing the code in M.1 was easy and, especially noteworthy, he recommended that "to maintain a standard updated version of the expert system, this maintenance should be performed by a single person or team and then distributed to all Naval Supply Centers." [Ref. 3: p. 41]

Potwin's two most important recommendations are future expert systems should be integrated with present Navy ADP assets, and that the feasibility of connecting PC local area networks to the UADPS-SP systems should be explored. [Ref. 3: p. 42].

The third NPS expert system prototype, an expert system for Causative Research was completed by Dolan and Ellison in June 1988. This expert system was a new application for inventory managers in keeping with Schill's recommendation to continue developing new systems for inventory management.

Dolan and Ellison concluded that Inventory Management could benefit from future development of expert systems. In addition, they suggested that M.1 was a practical language to use for expert system development and that it was available for use on personal computers. Like Schill, they recommended that an integration effort be conducted to interface their expert system with the mainframes used by the Navy Stock Points [Ref. 4: pp. 42-43]. They recommended that a Navy organization should be designated as

responsible for maintenance on the Causative Research Expert System. Finally, they suggested that systems for replenishment, technical research, hazardous material packing, bill processing, and material procurement were logical areas for future expert system development [Ref. 4: p. 44].

C. SUMMARY

A common thread can be found in the conclusions and recommendations of the developers of the three expert systems. They felt that their particular prototype implementation was successful, they all recommended that integration with Navy mainframe computers be explored, and Potwin and Dolan and Ellison all felt that M.1 was a very user-friendly and highly useful tool for implementing practical prototypes.

England's Hazardous Material expert system prototype, which utilizes the latest expert system shell technology (VP-EXPERT, which will be described in Chapter IV), represents the latest in expert system development for Navy Stock Points managers. It will not be discussed because it is still being developed by England. His thesis, describing that prototype, will be completed by June, 1990.

III. THEORETICAL ISSUES IN MAINTENANCE, CONVERSION, AND PROTOTYPING

A. INTRODUCTION

The conversion of the three stand-alone expert systems into one integrated system will provide a prototype by which users and managers at NAVSUP can perform an early assessment of the effectiveness of the proposed system. The integration effort requires that all rule bases be in the same language. It is expected that a system developed under the prototyping method will have to undergo many iterations before it is finally accepted.

To ensure proper design of the proposed integrated system, it is important to understand the critical issues related to maintenance, conversion, and prototyping.

B. MAINTENANCE

Maintenance is defined as "Modification of a software product after delivery to correct faults, improve performance or other attributes, or to adapt the product to a changed environment" [Ref. 6]. In the systems development life cycle (SDLC) model, maintenance is the last stage of the life cycle. Although it may appear to be the last phase, with a separate and distinct starting and stopping point, it overlaps many other phases of the life cycle.

The state of software maintenance in industry and government can be summarized in the following four points: there is a maintenance problem, maintenance is hard,

maintenance is expensive, and existing code should not be discarded [Ref. 7: pp. 303-304]. Norman Schneidewind lists the following three reasons for why we have a maintenance problem:

1. 75-80 percent of existing software was produced prior to significant use of structured programming.
2. It is difficult to determine whether a change in code will affect something.
3. It is difficult to relate specific programming actions to specific code. [Ref. 8]

He makes the following observation about the primary cause for the existing difficulty in performing maintenance:

> The main problem in doing maintenance is that we cannot do maintenance on a system which was not designed for maintenance. Unless we design for maintenance, we will always be in a lot of trouble after a system goes into production. [Ref. 6: p. 304]

Documentation in most programs and with most software systems is often poor, incomplete, non-existent, or a combination of the three. Inadequate documentation is an acknowledged fact by the software development community.

> The problem for most maintainers is that they have to maintain ill-documented code that is covered with patches with no comprehensible structure and that has data representations buried in the program code. It is a major detective work to find out how the program works, and each attempt to change it sets off mysterious bugs from the tangled undergrowth of unstructured code. [Ref. 9]

Further complicating the maintenance issues are an inability to trace the product or the process that created the product, inadequate change documentation, absence of change stability, the unknown chain reaction (ripple effect) that occurs when software changes are made and, finally, the view that maintenance is strictly a post delivery activity [Ref. 10]. E. Bush notes that maintenance has become expensive because "...programmers spend

most of their time maintaining programs..." and that "...a new standard for well written programs has emerged: how maintainable are they..." [Ref. 11].

According to P.J. Brown, software that is not adaptable or is replaced by more capable software will suffer what he terms death. Death is defined as software which is no longer used. Some additional significant factors that could contribute to death are death due to hardware changes, death due to software changes, and changes in requirements [Ref. 12: pp. 279-280]. Brown advocates that software developers should place their emphasis on developing a good initial product. He suggests that it is expensive to design software that enables maintenance, has adequate documentation, is portable (usable on different computer architectures), and which has a low number of bugs. [Ref. 12: p. 285]

C. CONVERSION

Conversion is defined as "a process in which changes are made in the software so that the original system will execute properly in the new environment" [Ref. 13: p. 1]. Conversion represents one subset of activities grouped under software maintenance efforts. Until recently, maintenance has received little attention. Conversion, therefore, has received even less.

When a decision to convert has been made, there are four strategies for implementing the conversion of software code.

1. Translation: primarily automatic conversion of software.
2. Recoding: manual conversion of software.
3. Reprogramming: implies a software development effort which may include some system redesign but no significant functional redesign.
4. Redesign: implies a software development effort which includes a functional redesign of the system. [Ref. 13: p. 2]

There are many reasons why an organization or firm may wish to change from one computer environment to another. Among the most common are: reduced cost, improved performance, increased reliability, and increased capacity [Ref. 13: p. 3].

D. PROTOTYPING

According to Senn, the prototyping method is an approach to [information] systems development. Senn states that:

> ...prototyping is based on the following fundamental principle: Users can point to features they like or dislike in an existing system more easily than they can describe them in an imaginary or proposed system. The prototype then is developed as a working system to allow users to identify the essential features in an information system. [Ref. 14: p. 611]

Prototyping, like many other accepted and proposed methods, follows a series of steps. Senn enumerates five steps in the prototyping technique:

1. Identify the user's known information requirements.
2. Develop a working model.
3. Use the model, or prototype, noting needed enhancements and changes.
4. Revise the prototype.
5. Repeat the preceding steps as necessary. [Ref. 14: p. 612]

Like any methodology, prototyping has its strengths and weaknesses. Senn lists five key issues that one must keep in mind when using the prototype technique:

1. Speed of development, not efficiency of prototype performance, is the overriding concern of both systems analyst and end-user.
2. The initial prototype is likely to be incomplete or unsatisfactory in one or more ways. Changes in specifications and modification of system features are expected.
3. Users should use the system in a hands-on fashion to determine by trial and error the changes and enhancements that are desirable.
4. Each iteration will result in one or more of the following changes: (1) modification of the data used in processing or the manner in which data are entered into the system, (2) changes in existing features, and (3) addition of new features.
5. A typical prototyping experience will have four to six iterations. [Ref. 14: pp. 612-613]

Finally, Senn regards prototyping as a short term process which is practical for today's generation of computer systems and level of end user sophistication. One of the primary benefits of prototyping is that the process can avoid the delivery of an information system that is neither functioning nor user-friendly [Ref. 14: pp. 612-613]. Another benefit is that the end-user can get his hands-on use of the system (incomplete

though it may be) well before a comparable full scale version of the system is implemented [Ref. 14: p. 613].

E. SUMMARY

Maintenance is a normal part of a software system's life cycle, and maintenance will be required on the integrated system described in this thesis as the demands and sophistication of the users increase. Enhancement of the existing code will be the most likely form of maintenance performed. However, one may expect that as the expert system shell software continues to evolve, possible conversion and redesign of the current prototype may be required. Ultimately, designing a system that allows easy maintenance will prevent the system and the rule bases from becoming obsolete.

Conversion is a part of maintenance. Conversion is often performed because there is a requirement to make the old software operate in a new environment. Reasons for converting code include reduced cost, improved performance, increased reliability, and increased capacity [Ref. 13: p. 2]. Conversion can be very labor intensive, and requires planning and control to prevent costs and schedule completion from getting out of control.

Prototyping is used to develop a running "rough draft" of a proposed software system. It has the benefit of providing an actual running program to the user for evaluation. It is far easier for the user to describe the strengths and deficiencies of programs running before him than it is to discuss how it should theoretically run.

IV. DESIGN AND IMPLEMENTATION OF THE INTEGRATED INVENTORY MANAGEMENT EXPERT SYSTEM

A. INTRODUCTION

This chapter describes the conversion and integration process for the three Navy Stock Points expert systems. The evaluation and selection of the conversion target language is discussed, followed by the process of actually converting the software. The architecture of the Integrated Inventory Management Expert System is presented next. Then, a description of how to operate or run the system is given. Finally, an actual sample consultation is illustrated.

B. SELECTION OF THE SOFTWARE DEVELOPMENT SHELL

VP-EXPERT, a new and widely used expert system shell in university circles, was chosen as the target conversion language. The development tool is best known by its low learning curve, understandability, and maintainability. Since maintenance is a highly expensive, time-consuming and often labor-intensive aspect of a system's life cycle, the selection of a target language that is easy to learn, has relatively low cost, and which can be modified easily is very important. The shell must also be flexible, have the capability to expand, and be user-friendly.

Understandability is a significant factor because conversion and maintenance are labor intensive. VP-EXPERT code is structured, making it simple to maintain. Documentation in VP-EXPERT is adequate. The VP-EXPERT reference manual is concise, clear, and provides a number of examples that are easy to follow [Ref. 15].

Flexibility, which allows advanced designs of knowledge bases and user interfaces, is a key consideration in deciding what expert system shell to use. Flexibility is important because it allows for the design of custom applications to meet the particular needs of the user. This is an essential feature when maintenance is required. Maintenance could be required, for example, when the regulations that are used as the basis for an expert system change. If the rule base is not updated to reflect the change in regulations, the effect is an inaccurate and unreliable expert system.

VP-EXPERT has features that allow for future expansion of the knowledge base and possible integration with other applications software. VP-EXPERT can support graphics and mouse-driven applications. It also interfaces with text files, spreadsheets, database files, and Structured Query Language (SQL) for accessing relational databases. VP-EXPERT's user interface offers a number of user-friendly features, such as windowing, pausing, multiple displays of text within a single rule, ability to adjust the consultation screen display to a number of possible formats, and availability of a user menu at the bottom which the user can consult. These features, like the flexibility trait, can be used to enhance the presentation of a consultation, and thus encourage user acceptance.

It was felt that the user interface should be simple enough that an inexperienced computer user (we will assume that users of this system will be familiar with inventory management) will be able to understand clearly what he and the system are doing. The system must provide the user with excellent help support and be able to guide him through the decision process. The completed integrated system must provide the user with an excellent dialogue capability. The system must also be driven by the user, not the reverse where the user is driven by the system.

Cost is another factor in considering an expert system shell. VP-EXPERT has a relatively low cost ($123.90 for the professional unlimited version). Although not necessarily the lowest priced expert system shell on the market, when compared to M.1, which costs approximately $5000, VP-EXPERT's price is very appealing.

Finally, since M.1 had been successfully implemented, and VP-EXPERT was similar to M.1, using VP-EXPERT should warrant a low risk of conversion.

Although the software used in this conversion effort was evaluated and mentioned by name throughout the thesis, no recommendations are being made that one brand of software be sought over another. Similarities and differences between the software may be indicated. However, it is ultimately the responsibility of the individual with specific requirements and preferences, to choose which software best suits his needs.

C. CONVERSION REQUIREMENTS AND PROCESS

The conversion process began with a detailed study of the work of the thesis students who had created the expert systems. This provided an initial impression of the scope of their work, and a feel for how their programs worked. Because this was a conversion project, it was important to obtain all documentation available on the systems. The documentation of interest was material that explained the program architecture or explained things from a general overall point of view. Unfortunately, Schill's thesis provided very little documentation for his coding. Instead, Schill explained how the actual systems operate and how he modeled his expert system on them. He did provide a data dictionary of the abbreviated variable names used in Delinquent Dues and Variable Ranking Lists. A data dictionary is a document that contains information on data used in an information system. This data dictionary was very useful while performing the

conversion because it provided an understanding of what the variable names meant. Although Potwin and Dolan and Ellison published sample runs of their systems in action, they also provided limited documentation. Their theses did contain glossaries that documented some of the terms and variable names that were used in the original (and converted rule bases). Although not all inclusive, they do provide some insight to the meaning of the variables used in their expert system rule bases.

These deficiencies in documentation (which are typical in most programs and expert systems) required the author to step through the program code to determine what it was doing.

Because of the author's unfamiliarity with the Navy supply system and the systems being converted, it was decided to keep all variable names the same wherever possible. In this way, problems with variables could be more easily tracked when the system was tested. This would also help future programmers who wished to modify the rule bases further. During such maintenance, the programmer can refer back to the original code and compare it to the converted code.

Converting the M.1 rule bases was straightforward because M.1 and VP-EXPERT have remarkably similar commands. When conversion of the Dolan and Ellison rule base (which consists of almost 200 rules) began, the initial approach was to manually (with a pencil and eraser) begin to modify the code on paper. This lead to the realization that a word processor was more appropriate and would substantially speed up the conversion process. Having become familiar with the basic commands of M.1, it was easy to convert the code by examination (visual inspection). Conversion from PROLOG code to VP-EXPERT was not difficult because the code was written in a shell-like structure. The data dictionary provided by Schill with his rule bases (written in PROLOG) facilitated the

translation of the abbreviated variable names in the shell-like structure into longer variable names that would indicate more clearly what the variables represent.

Machine limitations were not a serious issue for this conversion effort. The conversion was done largely on an IBM XT compatible personal computer (PC), although it was frequently conducted on IBM AT compatible machines. The most significant machine limitation was the speed of the machine. A particularly noticeable delay was experienced when loading and executing large rule bases on the IBM PC/XT.

Testing is a necessary, time consuming, and expensive endeavor. Fortunately, in the case of this particular conversion, actual testing of the converted programs required relatively little time. Testing was required to reveal two types of errors: errors in syntax and errors in logic. Syntax errors were usually easy to identify, whereas logic errors were more difficult. Logic errors usually were not apparent until system testing revealed flaws in system response, system displays, and overall performance.

Testing the system for syntax errors took very little time, since the VP-EXPERT interpreter would notify the author when an error in a statement existed, and then would provide the author with the rule base which needed correcting. This was a very useful feature since, by having this built-in editor, it was not necessary to exit the program to DOS, make corrections using a text editor or word processor, load the VP-EXPERT interpreter once more, and then load and execute the rule base all over again.

Testing the system for logic errors was, of course, more time consuming since logic errors require one to enter the rule base and try to discover where the problem is. Included in this classification are errors due to omission during conversion. Once the error is discovered and corrected, either the problem is solved or another error appears (previously concealed because of an error caused by the original error).

Following the conversion and testing phases, iterative enhancement of the code was done to improve the performance from the system.

The usual problems with conversion, testing, and machine limitations were not severe because of the small scale of the conversion and because only one person was involved. For a very large and complex project, one would expect that these problems would be very significant. This conversion endeavor did prove that having an automated conversion tool can greatly enhance the productivity of a person performing conversion of code.

D. THE INTEGRATED INVENTORY MANAGEMENT EXPERT SYSTEM ARCHITECTURE

The integrated system is simply an application program run under VP-EXPERT which provides the user with the option of running any of the programs. The system architecture is depicted in Figure 2, which shows the hierarchial design of this system. Figure 3 describes the system components.

All rule base applications require the VP-EXPERT interpreter to run. Once the VP-EXPERT interpreter is loaded, it can then execute any rule base. The integration module is a rule base that acts as the master control module. It is known as the main module of the hierarchy. The main module (or integration module) can call a help file module (another rule base) which in turn calls a help file. This help file is a large text file that contains some basic instructions on using the help system. The help file also contains the Delinquent Dues and Variable Ranking Lists data dictionary from Schill's thesis, the Dues Management data dictionary from Potwin's thesis, and the Causative Research glossary from Dolan and Ellison's thesis. These documents were converted into ASCII text files

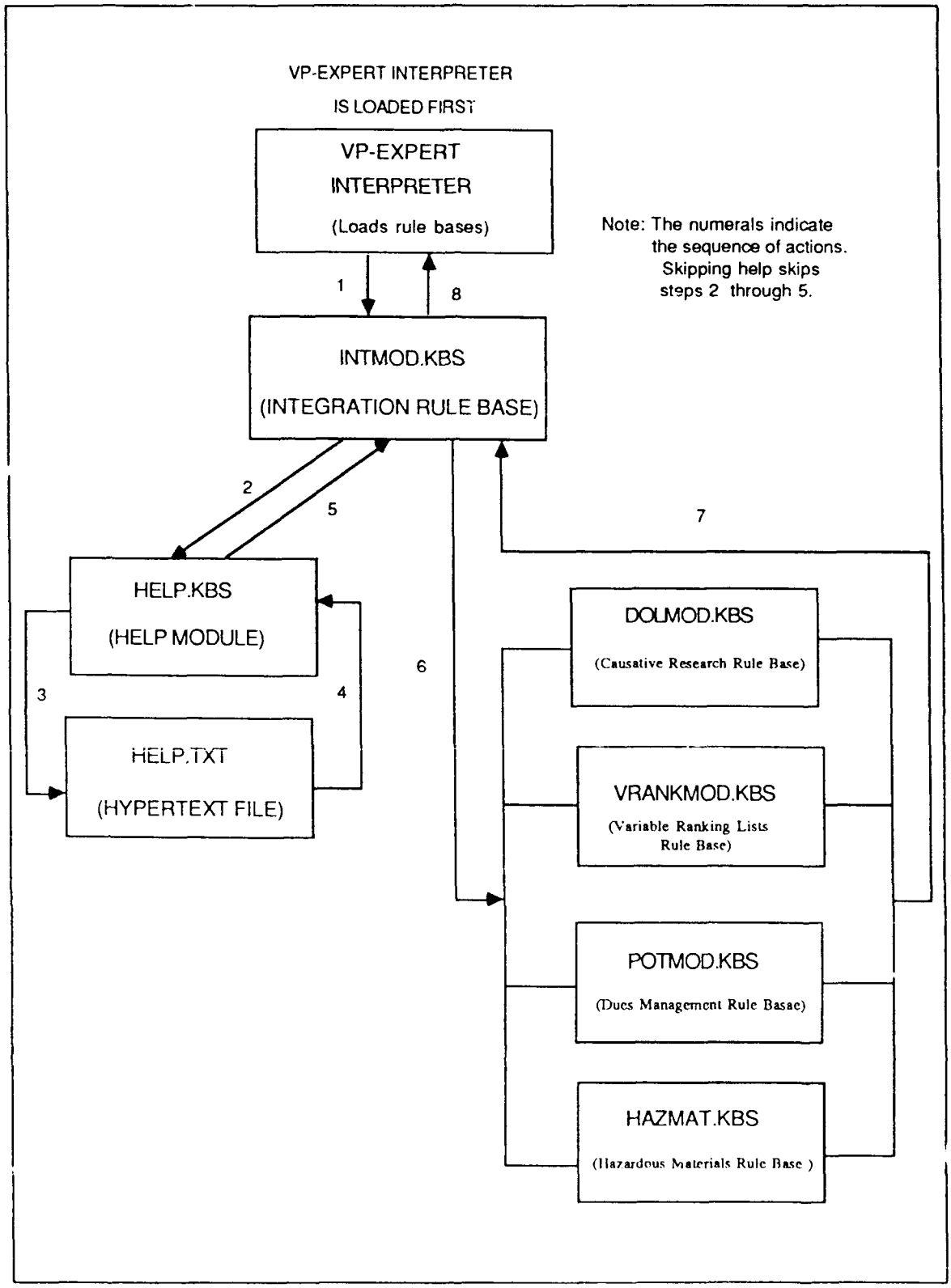

Figure 2. The Integrated Inventory Management Expert System Architecture

INTMOD.KBS	-	The integration module or main module (a rule base) was written by LT Rouska. It calls the help rule base and any one of the four rule bases.
VRANKMOD.KBS	-	The Variable Rankings Lists rule base was written by LT Schill and converted by LT Rouska. This rule base has not been tested for correctness.
POTMOD.KBS	-	The Delinquent Dues rule base was written by CAPT Potwin and converted by LT Rouska.
DOLMOD.KBS	-	The Causative Research rule base was written by LCDRs Dolan and Ellison and converted by LT Rouska.
HAZMAT.KBS	-	The Hazardous Material expert system was written in VP-EXPERT by LCDR England and integrated after the three other rule bases were converted.
FUTURE1.KBS	-	A "slot" for a future rule base. This represents a location where a new rule base can be inserted.
FUTURE2.KBS	-	Another "slot" for a future rule base. This represents a location where a second new rule base can be inserted.
HELP.KBS	-	The help rule base. It calls the hypertext help file called HELP.TXT. It is called by INTMOD. After HELP.KBS is finished executing, it returns control to INTMOD.KBS.
HELP.TXT	-	A hypertext help file for the integrated system. This help file provides basic information on how to use the system. It also provides information on the following: a data dictionary for Delinquent Dues and Variable Ranking Lists expert system, a data dictionary for Dues Management, and a glossary for Causative Research.

Figure 3. Summary of the Integrated Inventory Management Expert System Components

using a scanner, corrected using a word processor with a spell checker, and then copied into one large ASCII text file. These help files were written in a hypertext format and can interact with a mouse. Hypertext works only with VP-EXPERT rule bases. A hypertext file in VP-EXPERT is simply an ASCII file that contains a hyperword followed by several lines of characters. The hyperword is any word in the hypertext file that has an "*" immediately preceding it. Hyperwords appear in the body of the text as capitalized words. To activate a screen of text associated with that hyperword, use the mouse to point to that word and click it. If no mouse is available, then one can always type the hyperword into the terminal.

Because it is easy to learn how to write a help file in hypertext, the hypertext system was chosen to demonstrate the implementation of a customized help system. It is also easy to learn to write the rule base that will call the hypertext help file. The help file rule base returns control to the main module, allowing it to prompt the user for selection of a particular expert system. After the user has selected an expert system and runs it to obtain a conclusion, he is returned to the main module where he repeats the whole process of determining if he wants help and then selecting an expert system.

The integration module is the main control module in the integrated system architecture. The integration module presents the user with the help system first. If help is selected, control is passed to the help file rule base until the user terminates consultation with it. Upon termination, the user is returned to the main module and is presented with a selection of possible expert system choices. He chooses an expert system module and control is passed to that rule base until the user terminates execution. Upon termination of the consultation with the consulted rule base, the user is returned to the main module, and the whole process repeats itself.

Although this design is very simple, it demonstrates that integration of a customized help system and integration of numerous expert systems can be accomplished.

As Figure 2 shows, the integration rule base has the capacity for adding two future rule bases. However, any additional number of rule bases may be added if desired. This may be accomplished by examining the code provided to allow integration of future rule bases into the integration module (INTMOD.KBS) and duplicating it each time one wants to insert a rule base.

E. RUNNING THE INTEGRATED INVENTORY MANAGEMENT EXPERT SYSTEM

Because the integrated system depends upon the VP-EXPERT interpreter to execute the process, the VP-EXPERT interpreter must be loaded first. The opening screen is now displayed or it can be bypassed if desired. Bypassing the opening screen is an example of transparency where the user can go directly to his application without having to go through the interpreter's opening menu. If the opening screen is not bypassed, the user selects "Consult", and then chooses the "INTMOD" rule base. This loads the rule base into memory, and the interpreter checks it for errors as it is loaded. The consult menu is then displayed, and the user selects "Go". This executes the rule base. The integration module then asks the user if he wants to skip the help module. If one chooses help, he remains under control of the help module until he terminates the program. Then control is returned to the integration module, INTMOD.

Next the user will be asked if he wants to see the opening screens for the integrated system. This option is provided because users who are familiar with the system will probably not want to see the opening screens every time they run the system. The

program then asks the user if he wants to continue the session. This statement was included because, after one has consulted one of the rule bases controlled by the integration module, he will be returned to the integration module. The present system architecture causes the integration module to be reinitialized whenever control is returned to it from the help system or any of the associated rule bases. Unfortunately, this requires the user to always answer the system prompts for help, opening system displays, and continuing the consultation. Termination of the system operation can occur from the integration module by answering "No" or by pressing the "/" key and selecting Q for QUIT.

Now the user will be presented with a choice of options for choosing a particular rule base. After the choices have been displayed, if the user wants to refresh his memory on what the choices are, he can press the "/" key, and select the "Why" command from the menu at the bottom of the screen. This will display a statement that lists all options and their associated selection numbers. After the user selects his choice, the program indicates that one should expect a small delay while the program loads, and to press any key to load the selected rule base.

The user is then taken through the rule base of his choice. In all of the converted rule bases, if a rule cannot be found that satisfies the inputs of the user, a message is displayed indicating such. This was provided for the user's convenience because, during the testing of the converted systems, it was discovered that when VP-EXPERT cannot find a rule that satisfies all the user inputs it simply returns the user to the consultation menu.

Upon return to the integration module, the whole process repeats again with the system asking the user if he wants help.

F. A SAMPLE CONSULTATION

The screen in VP-EXPERT is divided into three windows. The top window is the consultation window and is used to display system generated questions and answers. The lower left screen is the rules window, which displays the rules being processed by VP-EXPERT. It is useful because the user can watch VP-EXPERT process each rule during a consultation. The lower right window is the results window. This window displays values that are assigned to variables as VP-EXPERT executes a rule base. If the user wishes to quit, forgets how to enter a selection, or doesn't know the answer to a question, VP-EXPERT provides reminders at the bottom of the screen. These reminders are located below the two lower windows, and consist of simple cues such as "Enter to select", "END to complete", "/Q to Quit", and "? for Unknown".

Appendix A provides a sample consultation using the Integrated Inventory Management Expert System. The consultation is illustrated through a series of step by step "snapshots", or images of the screen. The pictures illustrate the opening menu and screen of the VP-EXPERT interpreter, followed by the user selecting the program INTMOD (indicated by a "<-"). The next series shows that the file INTMOD.KBS is loaded and ready to run. The system queries the user: "Do you wish to skip the help system? The default selection is "no". (Appendix C contains the information presented in the help system). The next question posed to the user is "Do you wish to skip the opening statements?" This question is presented to those individuals who want information on the integrated system. The user will usually answer "yes" to this one. The sample run shows that the user chose "no" and is presented with the opening screens for the integrated system.

The next series of screens show the menu selection being displayed to the user. The user selects the Causative Research choice (selection 1). The remaining screens demonstrate the session with the Causative Research expert system. Once the user has obtained an answer or conclusion from the system, he is returned to the main module. At this point, the user can terminate the session by pressing the "/" key followed by a "Q" or he can execute either the Causative Research program or any of the other integrated expert systems.

G. EXPERT SYSTEMS CODE AND HELP FILE

Appendix B provides the reader with the VP-EXPERT code of the integrated expert system. This is useful to those who wish to understand the program structure or wish to modify it. During the conversion of the three rule bases, Potwin's floppy disk containing his rule base for Dues Management could not be located. Fortunately, he provided a copy of his code in Appendix A of his thesis. A scanner was used to scan the entire rule base into a text file. The text file was then edited using a word processor to check for obvious errors. Then the text file was loaded into the VP-EXPERT interpreter to check for syntax errors. The process took very little time and demonstrated the value in having the source code of a program readily available.

Appendix C is a listing of the contents of the help file used by the integrated system's help rule base. As discussed earlier, this file is a hypertext file. By convention, the hyperwords (or the words that VP-EXPERT uses as an index in the text file) are preceded by an asterisk (*). Throughout the file are bar symbols (denoted by the "|" symbol) that immediately precede certain words. In VP-EXPERT hypertext, hyperwords

appear on the screen in capital white lettering. Placing the "!" symbol before a word prevents the hypertext system from being displaying words as such.

Hypertext screens (or frames) can be chained together so that one frame calls another. File size is not a restriction on hypertext files. To maintain or modify hypertext files requires only a word processor or text editor that can edit and create ASCII files. The only restrictions are that no more than 23 lines of text can follow the hyperword and, one must limit the length of a line of text to approximately 63 columns for the currently defined consultation window.

V. CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

This thesis converted and integrated three stand-alone expert systems developed for NAVSUP at NPS by thesis students. These expert systems were developed to represent tasks that inventory managers at Navy Stock Points would be expected to perform. The three expert systems are: Delinquent Dues and Variable Ranking Lists, Dues Management, and Causative Research. LCDR Gary Westfall developed the decision rules that became the basis of the rule bases for the first expert system prototype. This prototype, Delinquent Dues and Variable Ranking Lists, was developed by LT William Schill and was written in PROLOG. CAPT Albert Potwin then developed the Dues Management expert system which consisted of Delinquent Dues and System Cancellations modules. Potwin modified the Delinquent Dues rules written by Schill and included the System Cancellations rules to provide a more comprehensive Dues Management expert system. These rules were written in M.1, an expert system shell. LCDRs William Dolan and James Ellison developed the third expert system, Causative Research. This rule base was also written in M.1.

VP-EXPERT was chosen as the target expert system shell to implement the conversion. It was chosen because it is easy to learn, easy to understand, and easy to maintain. A word processor was chosen to automate conversion of the code.

After the three expert systems were converted into VP-EXPERT rule bases, they were tested and compared against the documentation available from the previous thesis

work. The Variable Ranking Lists rule base could not be tested because of inadequate documentation.

A new rule base that integrates the converted rule bases was then developed. Although simple in design, it allows the user to run multiple rule bases (one at a time) during one consultation period. During this final integration effort, another expert system, Hazardous Materials, was developed by LCDR David England. This rule base was incorporated with the other three rule bases.

The development of the Integrated Inventory Management Expert System represents one possible prototype for implementing expert systems at Navy Stock Points. The system can be used and modified by inventory managers at all levels of experience. VP-EXPERT, the expert system shell used to implement the converted rule bases, is easy to maintain and easy to learn. It is hoped that these two traits will encourage others with more expertise and familiarity with the Stock Points inventory management system to this prototype as a basis for designing the system to their specific needs.

B. CONCLUSIONS

It is important to develop a conversion strategy before beginning the conversion effort. To help assure a successful conversion, it is vital to evaluate the effectiveness of the effort as the effort proceeds.

The conversion required much more time than was anticipated when the effort was initiated. The conversion effort can be expedited considerably with the use of a word processor. The word processor allows one to use macros to convert one language construct to another, thus saving time. As the process became automated, the amount of

time spent converting code decreased and the amount of time spent correcting errors and enhancing code increased.

The success of this endeavor to convert and integrate three stand-alone expert systems (while designing for maintainability) demonstrates the feasibility of performing small scale conversions. Given limited documentation, the converted expert systems were executed, and the results compared to documentation provided for each expert system. The only rule base that could not be tested was the Variable Ranking Lists module (one of Schill's two rule bases). This was due to a lack of documentation of system outputs or test case runs.

The Integrated Inventory Management Expert System prototype serves as a demonstration to top management of what a proposed integrated expert system looks like. This is important because it is they who must develop policy and deal with computer issues in the next several years. NAVSUP's management can use the prototype as a means for comparison of whether the system may be able to meet their future needs. If microcomputer-based expert systems are employed actively at NAVSUP, this prototype may evolve into something totally different from the original design.

For NAVSUP inventory stock point managers to benefit from this prototype, maintenance (in the form of code modification, user-interface displays modification, and overall design or rule base structure redesign) will be required. Additionally, without maintenance, the prototype will not evolve and its value to NAVSUP will decline. Software maintenance has long been an expensive and time consuming effort, and is an often neglected aspect of a software system's development life cycle (SDLC).

It is hoped that the experience in converting and maintaining the integrated system will serve as a base for future work in this area. The findings of this research should be

useful to individuals wishing to pursue continued development and integration of expert systems programs for NAVSUP. The general issues or concerns raised in this thesis should be applicable to other similar conversion efforts.

C. RECOMMENDATIONS

The integrated inventory management system needs to have a document that establishes proper terminology for variable names. This was not done due to the author's lack of expertise on the application domain. Proper terminology for variable names is different than common variables. Proper terminology means that standard definitions are used to describe all variables used in all rule bases. The use of a standardized terminology for variable names is important when conducting maintenance or conversion because it helps avoid redundancy of variables. Failure to establish documentation that provides guidance on the naming of variables, and failure to consult the data dictionary (which contains the definition and domain of the data used in the system) will lead to expert systems which cannot be effectively integrated.

Common variables are those variables which are common to more than one expert system. One may think of a common variable as being akin to a global variable in a third generation programming language. To illustrate, take two different systems which have two different variable names, both of which have the same meaning. If they are called by two different variable names, then they are redundant. In a case like this, the same variable should have the same name in both expert systems. The use of common variables also reduces the amount of tracing and verifying required by someone maintaining or converting code. Finally, in the case of microcomputers with

approximately 640K of memory, using common variables reduces memory requirements (by eliminating redundant variable assignments).

The priority of the development of future expert systems for Stock Points inventory management must be an integrated system. Without an integrated approach, fragmentation of the expert systems and user frustration will remain high, leading to a lack of use of the system. Worse yet, when the expert systems are not designed with user friendliness or maintainability in mind, the results are systems that are not reliable because they do not reflect current policy. Systems that are not reliable are not used.

Finally, it is strongly recommended that this system be installed on microcomputers throughout the Navy Stock Points system to allow evaluation by personnel at all levels of management. If the integrated expert system shows potential for acceptance, certain individuals should given the responsibility for maintaining the rule bases and ensuring they reflect current policy.

APPENDIX A. A SAMPLE RUN OF THE INTEGRATED SYSTEM

The following graphics are "snapshots" of a consultation with the Causative Research expert system, originally written by LCDR William Dolan and LCDR James Ellison in M.1. This converted version of the Causative Research expert system is implemented in VP-EXPERT. These snapshots were taken using a screen capture program.

The VP-EXPERT interpreter displays are shown first, followed by displays provided by the integration module, followed by additional integrated system displays. Finally, the last series of displays are from the consultation with the Causative Research expert system using the inventory adjustments causative research selection (chosen in the program by the user).

A "<-" symbol is displayed in most of the exhibits to indicate that this is the selection that the user would make.

V P - E X P E R T
Version 2.02
Copyright (c) 1988
Brian Sawyer
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Published by Paperback Software International

1Help 2Induce 3Edit 4Consult <- 5Tree 6FileName 7Path 8Quit

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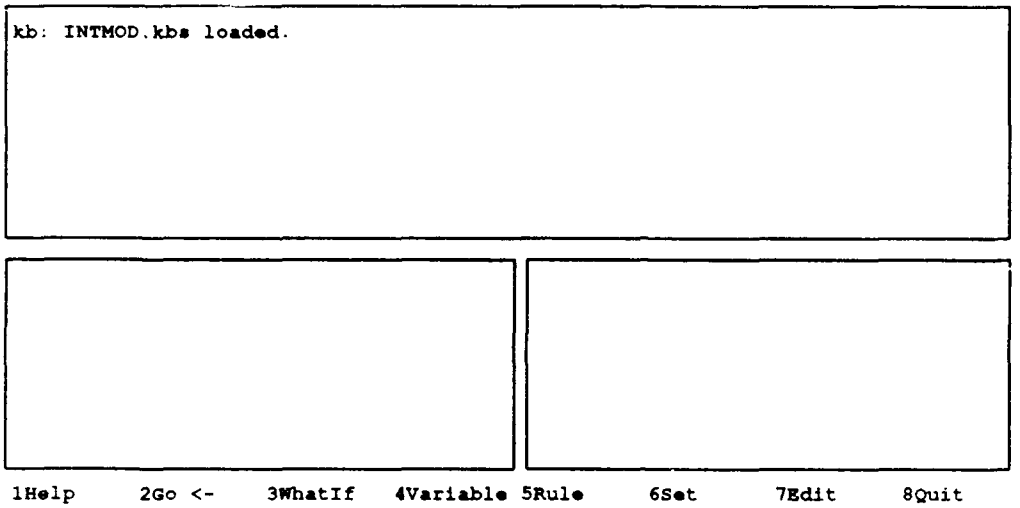
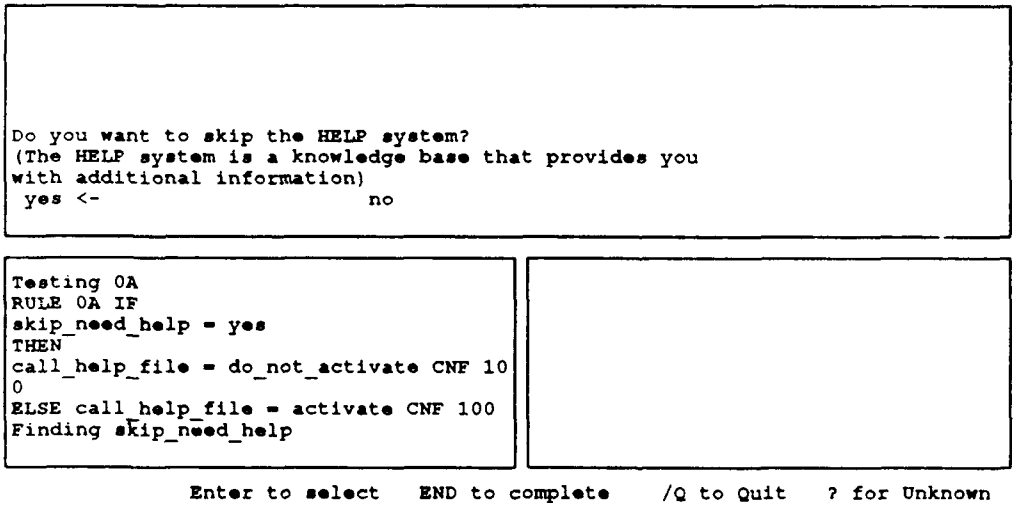
Editor Portion Copyright (c) 1984, 1985, 1987, Idea Ware Inc.

Published by Paperback Software International

What is the name of the knowledge base you want to use?

DOLANHLP DOLMOD HAZMAT HELP INTMOD <-


kb: INTMOD.kbs loaded.
1Help 2Go <- 3WhatIf 4Variable 5Rule 6Set 7Edit 8Quit


Do you want to skip the HELP system?
(The HELP system is a knowledge base that provides you
with additional information)
yes <- no
Testing 0A
RULE 0A IF
skip_need_help = yes
THEN
call_help_file = do_not_activate CNF 10
0
ELSE call_help_file = activate CNF 100
Finding skip_need_help
Enter to select END to complete /Q to Quit ? for Unknown

(At this point we have returned from the help system and the integrated system is asking us if we want any more help. Since we just finished with the help system, we tell the system that we want to skip the help system.)

```
Do you want to skip the HELP system?
(The HELP system is a knowledge base that provides you
with additional information)
 yes <-                        no


Do you wish to skip the opening statements?
 yes                          no <-
```

```
Finding skip_need_help
Finding show_all_the_text
Testing 0
RULE 0 IF
skip = no
THEN
show_all_the_text = yes CNF 100
Finding skip
```

```
skip_need_help = yes CNF 100
call_help_file = do_not_activate CNF
100
```

Enter to select END to complete /Q to Quit ? for Unknown

```
                              A N

        I N T E G R A T E D   E X P E R T   S Y S T E M

                              F O R

      I N V E N T O R Y   M A N A G E R S   A T   N A V Y

        R E T A I L   S U P P L Y   S T O C K   P O I N T S

                            March 1990

                                                Press any Key
```

```
THEN
show_all_the_text = yes CNF 100
Finding skip
```

```
   WELCOME TO THE INTEGRATED INVENTORY MANAGEMENT EXPERT SYSTEM
FOR NAVY STOCK POINTS. THIS PROGRAM ALLOWS THE USER TO CHOOSE ONE
OF A SELECTION OF EXPERT SYSTEM PROGRAMS THAT HAVE BEEN WRITTEN BY
OTHER THESIS STUDENTS.
   THIS PROGRAM REPRESENTS AN EFFORT TO CONVERT THREE RULE BASES AND
INTEGRATE THEM INTO ONE UNIT. THIS VERSION OF THE INTEGRATED SYSTEM
RETURNS YOU TO TO THIS MASTER CONTROL MODULE AFTER RUNNING A CONSULTATION.
ONCE YOU HAVE RETURNED TO THE MASTER CONTROL MODULE, YOU CAN EITHER QUIT OR
RUN ANOTHER EXPERT SYSTEM CONSULTATION. JUST SELECT 'Go' and PRESS 'Enter'.
   MORE MODIFICATIONS AND TESTING OF THE INTEGRATION ISSUES WILL BE
FORTHCOMING.
                                                        Press any Key.
```

```
Testing 0
RULE 0 IF
skip = no
THEN
show_all_the_text = yes CNF 100
Finding skip
```

```
100
skip = No CNF 100
show_all_the_text = yes CNF 100
```

```
Do you wish to CONTINUE the consultation?
 Yes <-                    No
```

```
Finding stop
Testing 00
RULE 00 IF
continue_consultation = No
THEN
stop = Yes CNF 100
ELSE stop = No CNF 100
Finding continue_consultation
```

```
skip_need_help = yes CNF 100
call_help_file = do_not_activate CNF
100
skip = No CNF 100
show_all_the_text = yes CNF 100
```

```
Enter to select   END to complete   /Q to Quit   ? for Unknown
```

```
Press any key to get the listing of programs that will be
offered to you:
```

```
Finding continue_consultation
Finding goal
Testing 1
RULE 1 IF
selection = Selection_1
THEN
goal = Causative_Research CNF 100
Finding selection
```

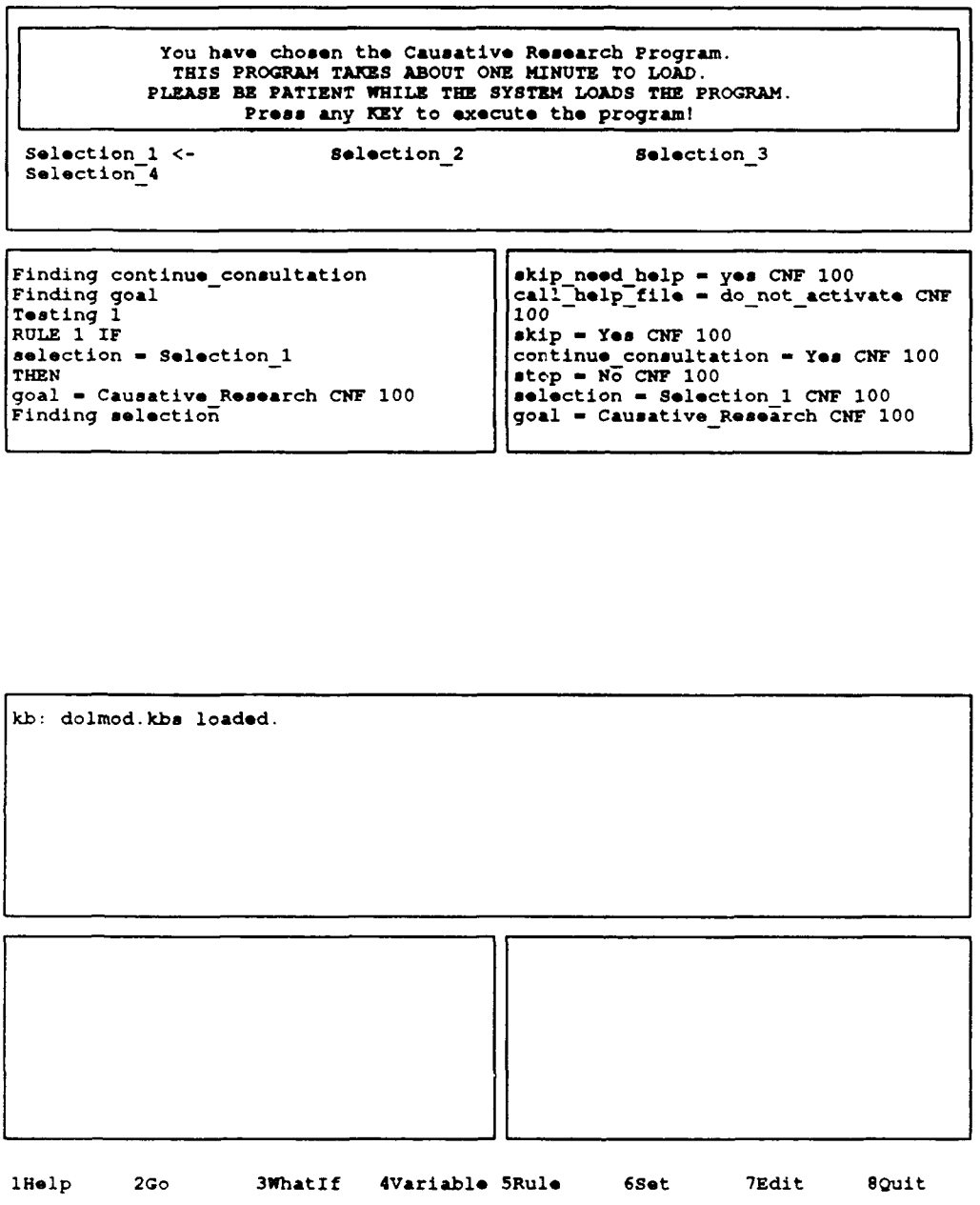
```
skip_need_help = yes CNF 100
call_help_file = do_not_activate CNF
100
skip = No CNF 100
show_all_the_text = yes CNF 100
continue_consultation = Yes CNF 100
stop = No CNF 100
```

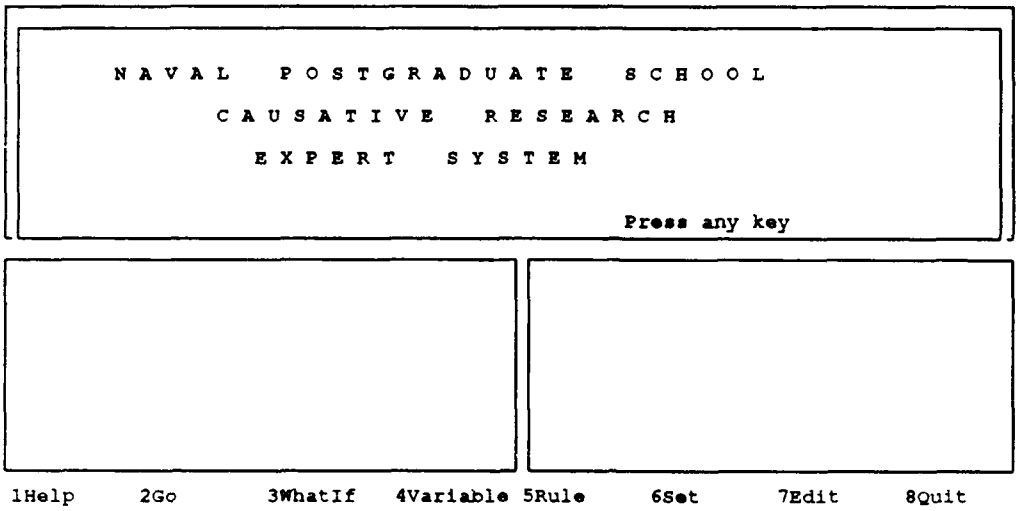
```
Press any key to get the listing of programs that will be
offered to you:

Selection 1:    Causative Research
Selection 2:    Delinquent Dues and System Cancellations
Selection 3:    Hazardous Materials
Selection 4:    Variable Rankings                  <<PRESS any KEY!!!>>
 Selection_1              Selection_2              Selection_3
 Selection_4
```

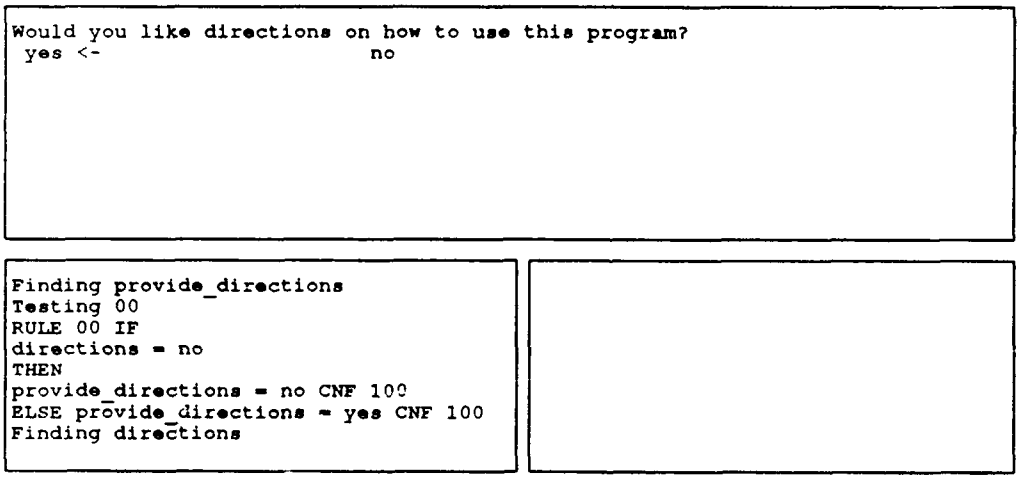
```
Finding continue_consultation
Finding goal
Testing 1
RULE 1 IF
selection = Selection_1
THEN
goal = Causative_Research CNF 100
Finding selection
```

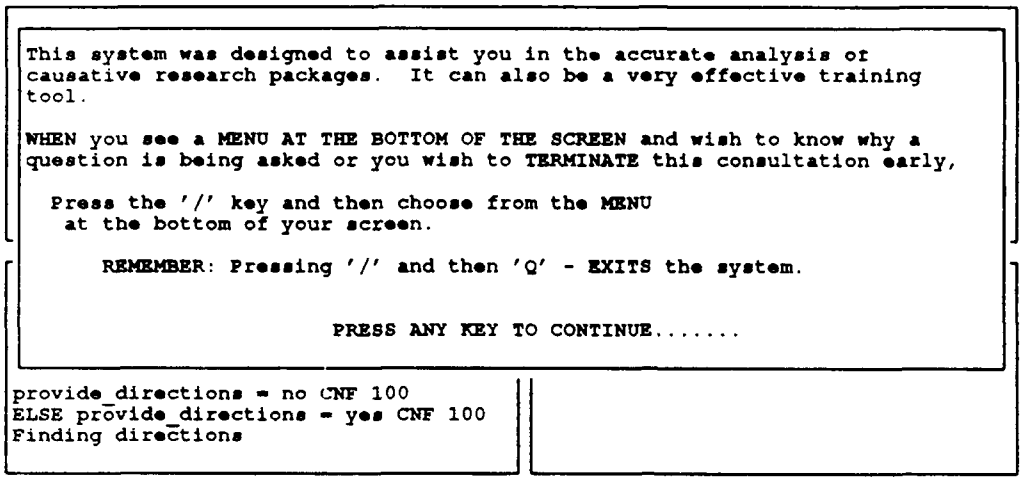
```
skip_need_help = yes CNF 100
call_help_file = do_not_activate CNF
100
skip = Yes CNF 100
continue_consultation = Yes CNF 100
stop = No CNF 100
```

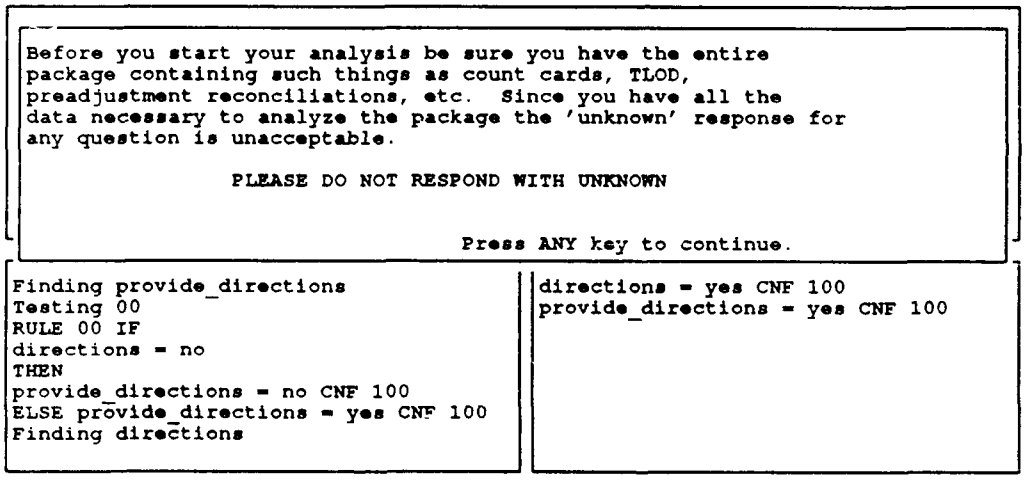
```
Enter to select   END to complete    /Q to Quit   ? for Unknown
```

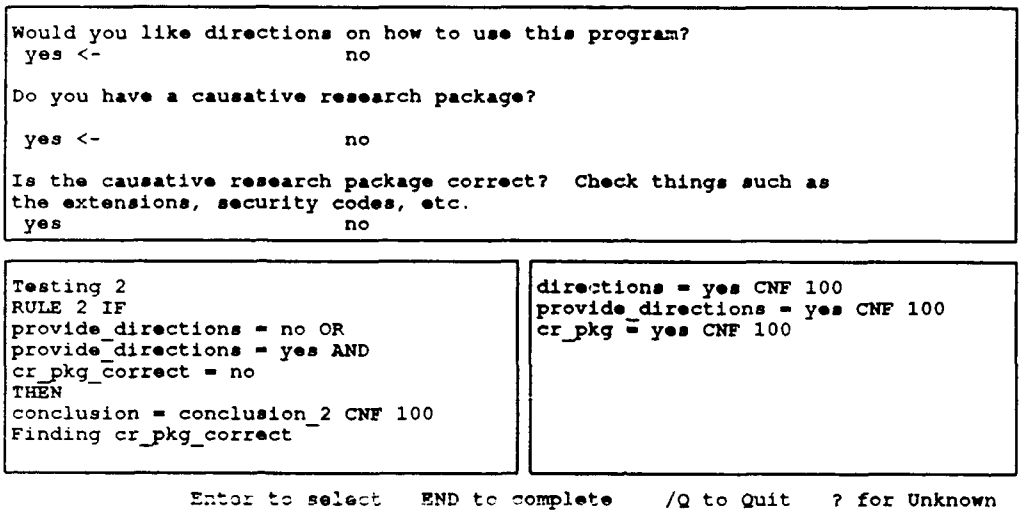

You have chosen the Causative Research Program.
THIS PROGRAM TAKES ABOUT ONE MINUTE TO LOAD.
PLEASE BE PATIENT WHILE THE SYSTEM LOADS THE PROGRAM.
Press any KEY to execute the program!
Selection_1 <-
Selection_2
Selection_3
Selection_4
Finding continue_consultation
Finding goal
Testing 1
RULE 1 IF
selection = Selection_1
THEN
goal = Causative_Research CNF 100
Finding selection
skip_need_help = yes CNF 100
call_help_file = do_not_activate CNF 100
skip = Yes CNF 100
continue_consultation = Yes CNF 100
stop = No CNF 100
selection = Selection_1 CNF 100
goal = Causative_Research CNF 100
kb: dolmod.kbs loaded.
1Help
2Go
3WhatIf
4Variable
5Rule
6Set
7Edit
8Quit

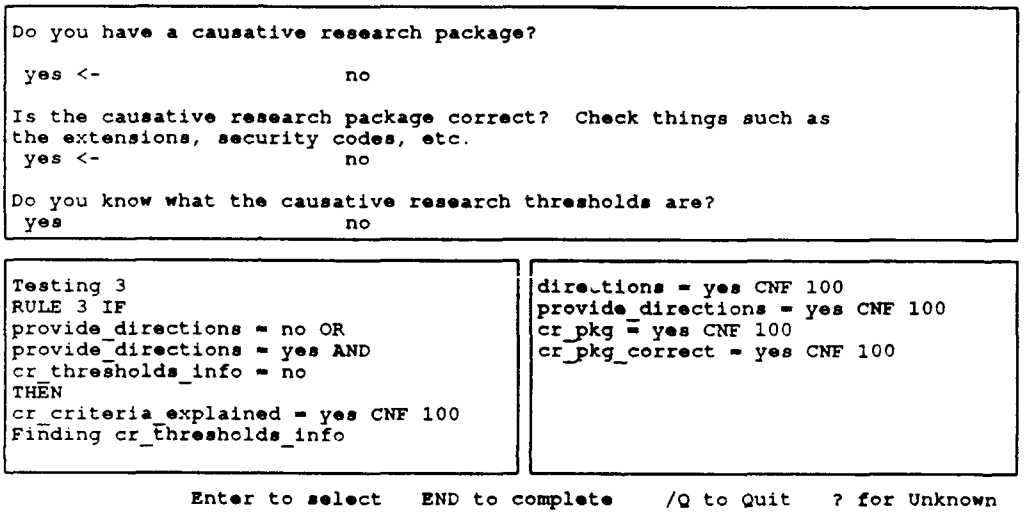

N A V A L P O S T G R A D U A T E S C H O O L
C A U S A T I V E R E S E A R C H
E X P E R T S Y S T E M
Press any key
1Help 2Go 3WhatIf 4Variable 5Rule 6Set 7Edit 8Quit


Would you like directions on how to use this program?
yes <- no
Finding provide_directions
Testing 00
RULE 00 IF
directions = no
THEN
provide_directions = no CNF 100
ELSE provide_directions = yes CNF 100
Finding directions
Enter to select END to complete /Q to Quit ? for Unknown


This system was designed to assist you in the accurate analysis or causative research packages. It can also be a very effective training tool.
WHEN you see a MENU AT THE BOTTOM OF THE SCREEN and wish to know why a question is being asked or you wish to TERMINATE this consultation early,
Press the '/' key and then choose from the MENU at the bottom of your screen.
REMEMBER: Pressing '/' and then 'Q' - EXITS the system.
PRESS ANY KEY TO CONTINUE.....
provide_directions = no CNF 100
ELSE provide_directions = yes CNF 100
Finding directions


Before you start your analysis be sure you have the entire package containing such things as count cards, TLOD, preadjustment reconciliations, etc. Since you have all the data necessary to analyze the package the 'unknown' response for any question is unacceptable.
PLEASE DO NOT RESPOND WITH UNKNOWN
Press ANY key to continue.
Finding provide_directions
Testing 00
RULE 00 IF
directions = no
THEN
provide_directions = no CNF 100
ELSE provide_directions = yes CNF 100
Finding directions
directions = yes CNF 100
provide_directions = yes CNF 100


Would you like directions on how to use this program?
yes <- no
Do you have a causative research package?
yes <- no
Is the causative research package correct? Check things such as
the extensions, security codes, etc.
yes no
Testing 2
RULE 2 IF
provide_directions = no OR
provide_directions = yes AND
cr_pkg_correct = no
THEN
conclusion = conclusion_2 CNF 100
Finding cr_pkg_correct
directions = yes CNF 100
provide_directions = yes CNF 100
cr_pkg = yes CNF 100
Enter to select END to complete /Q to Quit ? for Unknown


Do you have a causative research package?
yes <- no
Is the causative research package correct? Check things such as
the extensions, security codes, etc.
yes <- no
Do you know what the causative research thresholds are?
yes no
Testing 3
RULE 3 IF
provide_directions = no OR
provide_directions = yes AND
cr_thresholds_info = no
THEN
cr_criteria_explained = yes CNF 100
Finding cr_thresholds_info
directions = yes CNF 100
provide_directions = yes CNF 100
cr_pkg = yes CNF 100
cr_pkg_correct = yes CNF 100
Enter to select END to complete /Q to Quit ? for Unknown

The following adjustments will undergo causative research:

1. All physical inventory adjustments of controlled items.
2. All physical inventory adjustments of $800 or more if a pilferable item.
3. The requirement for causative research for all other adjustments will be determined using the following table:

Value of Inventory	Research Threshold
up to $100 million	$2500
$100 - $800 million	$5000
$800 - $1.5 billion	$10,000
over $1.5 billion	$16,000

4. Additionally, stock points will randomly select for causative research 1% of the adjustments which fall below the above research thresholds.

Press ANY key to continue.

Does the causative research package meet all the required criteria and thresholds?

yes <- no

Is the causative research package complete? Check things like TLOD, count cards, pre_adjustment reconciliations (ZDGs), information about the count to determine if the physical count was accurate, etc.

yes <- no

```
Testing 8
RULE 8 IF
provide_directions = no OR
provide_directions = yes AND
cr_pkg_complete = no
THEN
conclusion = conclusion_4 CNF 100
Finding cr_pkg_complete
```

```
directions = yes CNF 100
provide_directions = yes CNF 100
cr_pkg = yes CNF 100
cr_pkg_correct = yes CNF 100
cr_thresholds_info = no CNF 100
cr_criteria_explained = yes CNF 100
cr_criteria_known = yes CNF 100
cr_criteria_ok = yes CNF 100
```

Enter to select END to complete /Q to Quit ? for Unknown

```
Inventory adjustments include warehouse refusals and other adjustments
resulting from physical inventory findings.

                                    Press ANY key to continue.
```

```
ELSE crp_go = no CNF 100
Finding cr_criteria
Testing 6
RULE 6 IF
cr_criteria_known = yes AND
cr_criteria_ok = yes
THEN
cr_criteria = yes CNF 100
```

```
cr_thresholds_info = no CNF 100
cr_criteria_explained = yes CNF 100
cr_criteria_known = yes CNF 100
cr_criteria_ok = yes CNF 100
cr_pkg_complete = yes CNF 100
pre_adj = yes CNF 100
cr_criteria = yes CNF 100
crp_go = yes CNF 100
```

```
Have any adjustments been made to the causative research
package?  Or is this a classified, pilferable or sensitive
item?
 yes <-                    no

What type of causative research package is this?
 inventory_adjustment <-  delayed_receipt_or_0     classfied_pilferable
 DLA_material
```

```
THEN
cr_criteria = yes CNF 100
Finding crp_type
Testing 53A
RULE 53A IF
crp_type = DLA_material
THEN
crp_type = display_DLA_message CNF 100
```

```
cr_thresholds_info = no CNF 100
cr_criteria_explained = yes CNF 100
cr_criteria_known = yes CNF 100
cr_criteria_ok = yes CNF 100
cr_pkg_complete = yes CNF 100
pre_adj = yes CNF 100
cr_criteria = yes CNF 100
crp_go = yes CNF 100
```

```
Enter to select   END to complete    /Q to Quit    ? for Unknown
```

```
Have any causative research adjustments already been made to
this package? Adjustments like ZAT or ZAX for all or a portion of
the discrepancy.
    yes                 no <-
```

```
cr_criteria = yes CNF 100
Finding crp_type
Testing 53A
RULE 53A IF
crp_type = DLA_material
THEN
crp_type = display_DLA_message CNF 100
Finding cr_adj
```

```
cr_criteria_known = yes CNF 100
cr_criteria_ok = yes CNF 100
cr_pkg_complete = yes CNF 100
pre_adj = yes CNF 100
cr_criteria = yes CNF 100
crp_go = yes CNF 100
crp_type = inventory_adjustment CNF 1
00
```

```
Enter to select   END to complete    /Q to Quit   ? for Unknown
```

```
Has a physical count of the material been conducted and do you
have the count cards?
 yes <-                    no

Does the MSIR balance equal the physical count balance?  DOCID
XXD provides MSIR information such as locations, on_hand
quantity, etc., to compare with the physical count.
 yes                       no <-
```

```
RULE 12 IF
crp_go = yes AND
crp_type = inventory_adjustments AND
cr_adj = no AND
phys_count = yes
THEN
whr_go = yes CNF 100
Finding msir_phys_count
```

```
pre_adj = yes CNF 100
cr_criteria = yes CNF 100
crp_go = yes CNF 100
crp_type = inventory_adjustment CNF 1
00
cr_adj = no CNF 100
phys_count = yes CNF 100
whr_go = yes CNF 100
```

```
Enter to select   END to complete    /Q to Quit   ? for Unknown
```

```
Is there any 'float' on the item that reconciles the
discrepancy?  In researching the float check  for in-process
issues or receipts, ZELs, condition code problems, and MTIS.
 yes <-                    no

Does the float reconcile the entire amount of the item in
question?
 yes                       no <-
```

```
Finding whr_go_2_b
Testing 44
RULE 44 IF
whr_go_2 = yes AND
float = yes
THEN
whr_go_2_b = yes CNF 100
Finding total_recon_float
```

```
00
cr_adj = no CNF 100
phys_count = yes CNF 100
whr_go = yes CNF 100
msir_phys_count = no CNF 100
whr_go_2 = yes CNF 100
float = yes CNF 100
whr_go_2_b = yes CNF 100
```

Enter to select END to complete /Q to Quit ? for Unknown

```
Does the TLOD reveal any discrepancies that explain the
unreconciled balance? Check one year's transactions or back to
the date of the last inventory, whichever is first.
 yes                       no <-

Do you know what additional avenues can be investigated to
assist in resolving the discrepancy?
 yes                       no <-
```

```
Finding addl_aves_explained
Testing 108
RULE 108 IF
addl_aves_info = no AND
addl_aves_info_cont = continue
THEN
addl_aves_explained = yes CNF 100
Finding addl_aves_info
```

```
whr_go = yes CNF 100
msir_phys_count = no CNF 100
whr_go_2 = yes CNF 100
float = yes CNF 100
whr_go_2_b = yes CNF 100
total_recon_float = no CNF 100
whr_go_2_b_1 = yes CNF 100
tlod = no CNF 100
```

Enter to select END to complete /Q to Quit ? for Unknown

Some avenues are

1. GBLs,
2. call the shipping IM,
3. check paperwork in the storage bins,
4. check with commands that recently received an issue of the item to see how many they received,
5. check the ROD file,
6. check the contract for erroneous distribution of material (i.e. did we get material headed for another activity?),
7. Check for recent customer refusals that failed to post properly,
8. Check gains to see if a 'cancelled due' was received,

Press any key to continue.

Finding addl_aves_info_cont | addl_aves_explained = yes CNF 100

9. check all condition codes and all locations,
10. check staging or frustrated material areas,
11. was it a 'hot item' that came straight out of repair to a customer without the proper documentation,
12. check recent change notices for unit of issue or unit pack changes,
13. look for recent warehouse or customer refusals,
14. check previous causative research packages on this item for adjustment causes.
15. check unusual unit of issues (matched sets, issues by weight factors, etc.) for possible erroneous issues or receipts,
16. Check for recent re-warehousing moves (DOCID ZEL).

Press ANY key to continue.

Finding addl_aves_info_cont | addl_aves_explained = yes CNF 100

```
Do any of these additional avenues help resolve the discrepancy?

 yes <-                    no

Did the additional information discovered correct the entire
discrepancy?
 yes                       no <-
```

```
Testing 112
RULE 112 IF
addl_aves_known = yes AND
addl_aves = yes AND
addl_aves_total_adj = yes
THEN
addl_aves_2 = yes CNF 100
Finding addl_aves_total_adj
```

```
whr_go_2_b_1 = yes CNF 100
tlod = no CNF 100
addl_aves_info = no CNF 100
addl_aves_info_cont = continue CNF 10
0
addl_aves_explained = yes CNF 100
addl_aves_known = yes CNF 100
addl_aves = yes CNF 100
```

```
Enter to select   END to complete   /Q to Quit   ? for Unknown
```


```
Do any of these additional avenues help resolve the discrepancy?

 yes <-                    no

Did the additional information discovered correct the entire
discrepancy?
 yes                       no <-
```

```
Testing 112
RULE 112 IF
addl_aves_known = yes AND
addl_aves = yes AND
addl_aves_total_adj = yes
THEN
addl_aves_2 = yes CNF 100
Finding addl_aves_total_adj
```

```
whr_go_2_b_1 = yes CNF 100
tlod = no CNF 100
addl_aves_info = no CNF 100
addl_aves_info_cont = continue CNF 10
0
addl_aves_explained = yes CNF 100
addl_aves_known = yes CNF 100
addl_aves = yes CNF 100
```

```
Enter to select   END to complete   /Q to Quit   ? for Unknown
```

```
The system's conclusion is:  Process the discovered partial
information, reverse the inventory adjustment and survey the remaining
amount of the adjustment if necessary.

                                        Press ANY key to continue.
```

```
Finding addl_aves_3
Testing 113
RULE 113 IF
addl_aves_known = yes AND
addl_aves = yes AND
addl_aves_total_adj = no
THEN
addl_aves_3 = yes CNF 100
```

```
addl_aves_info_cont = continue CNF 10
0
addl_aves_explained = yes CNF 100
addl_aves_known = yes CNF 100
addl_aves = yes CNF 100
addl_aves_total_adj = no CNF 100
addl_aves_3 = yes CNF 100
conclusion = conclusion_33 CNF 100
```

```
Press ANY key to return to the Main Menu.
```

```
Finding addl_aves_3
Testing 113
RULE 113 IF
addl_aves_known = yes AND
addl_aves = yes AND
addl_aves_total_adj = no
THEN
addl_aves_3 = yes CNF 100
```

```
addl_aves_info_cont = continue CNF 10
0
addl_ave· explained = yes CNF 100
addl_ave  known = yes CNF 100
addl_ave. = yes CNF 100
addl_aves_total_adj = no CNF 100
addl_aves_3 = yes CNF 100
conclusion = conclusion_33 CNF 100
```

APPENDIX B. LISTING OF PROGRAM CODE

```
!     This appendix contains the VP-EXPERT code for the following
!     rule bases (in the order listed): Causative Research, Dues
!     Management, Variable Ranking Listings, Hazardous Materials,
!     The Integrated Inventory Management Expert System Main
!     Module, the Help System rule base, and a simple rule base
!     provides instructions on how to add a new expert system to
!     the integrated system's rule bases.


!/############################################################/
```

CAUSATIVE RESEARCH RULE BASE

This is the code for the Causative Research rule base. The name of the rule base file is called dolmod.kbs. This rule base was written by William D. Dolan and James D. Ellison in June 1988, in the expert system language M.1. The rule base was converted in March 1990 into the expert system language VP-EXPERT. All but one or two rules were converted without having to alter the variables.

```
ENDOFF;
ACTIONS
WOPEN 1,1,1,10,77,5
ACTIVE 1
DISPLAY "


                C A U S A T I V E   R E S E A R C H

                   E X P E R T   S Y S T E M

                                                    Press any key~"
WCLOSE 1
     FIND provide_directions
     FIND conclusion
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "                        Press ANY key to return to the Main
Me. u.

~ "
   CHAIN intmod;
```

```
!These are the rules for the converted rule base.


RULE 00
IF      directions = no
THEN    provide_directions = no
WOPEN 1,1,1,11,77,3
ACTIVE 1
   DISPLAY "Before you start your analysis be sure you have the

entire package containing such things as count cards, TLOD,
preadjustment reconciliations, etc.  Since you have all the
data necessary to analyze the package the 'unknown' response for
any question is unacceptable.

                PLEASE DO NOT RESPOND WITH UNKNOWN


                                        Press ANY key to continue.~"

WCLOSE 1
```

```
ELSE provide_directions = yes
WOPEN 1,1,1,14,77,3
ACTIVE 1
        DISPLAY
"This system was designed to assist you in the
accurate analysis of causative research packages. It can also be
a very effective training tool.  The following codes are used:

          1.  'ALT' L - Loads the program.
          2.  'ALT' G - Executes the program.
          3.  'ALT' W - Explains the reason for the question
                                being asked.
          4.  'ALT' A - Aborts the consultation in process.
          5.  Pressing '/' and then 'Q' - Exits the system.


                              PRESS ANY KEY TO CONTINUE.......~ "
WCLOSE 1
WOPEN 1,1,1,11,77,3
ACTIVE 1
DISPLAY "Before you start your analysis be sure you have the
entire package containing such things as count cards, TLOD,
preadjustment reconciliations, etc.  Since you have all the
data necessary to analyze the package the 'unknown' response for
any question is unacceptable.

                    PLEASE DO NOT RESPOND WITH UNKNOWN


                                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 1
IF    provide_directions = no OR
      provide_directions = yes AND
      cr_pkg = no
THEN conclusion = conclusion_1
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY
"The system's conclusion is:  If there is no package, there is no
analysis required.

                                                    Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "If there is no causative research package you cannot do
any analysis.";


RULE 2
IF       provide_directions = no OR
         provide_directions = yes AND
         cr_pkg_correct = no
THEN conclusion = conclusion_2
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Return causative research
package
to the originator.

                                                  Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "If the causative research package is not correct you
cannot  do  an  accurate  analysis.   Return  the  package  to  the
originator.";
```

```
RULE 3
IF      provide_directions = no OR
        provide_directions = yes AND
        cr_thresholds_info = no
THEN cr_criteria_explained = yes
WOPEN 1,1,1,21,77,3
ACTIVE 1
        DISPLAY "The following adjustments will undergo causative

                    research:

        1.  All physical inventory adjustments of controlled
                items.
        2.  All physical inventory adjustments of $800 or more if

            a pilferable item.
        3.  The requirement for causative research for all other

            adjustments will be determined using the following
                table:
                Value of Inventory     Research Threshold
                up to $100 million          $2500
                $100 - $800 million         $5000
                $800 - $1.5 billion        $10,000
                 over $1.5 billion         $16,000
        4.  Additionally, stock points will randomly select for
            causative research 1% of the adjustments which fall
            below the above research thresholds.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "If you do not know what the causative research
thresholds are, they will be shown to you; if you do know what
they are, this step will be skipped.";

RULE 4
IF      provide_directions = no OR
        provide_directions = yes AND
        cr_thresholds_info = yes
THEN understand_cr_criteria = yes
DISPLAY ""
BECAUSE "";
```

```
RULE 5
IF      cr_criteria_explained = yes OR
        understand_cr_criteria = yes
THEN cr_criteria_known = yes
DISPLAY ""
BECAUSE "";

RULE 6
IF      cr_criteria_known = yes AND
        cr_criteria_ok = yes
THEN cr_criteria = yes
DISPLAY ""
BECAUSE "";

RULE 7
IF      cr_criteria_known = yes AND
        cr_criteria_ok = no
THEN conclusion = conclusion_3
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "The system's conclusion is:  Since this package does not
meet the
thresholds for causative research return it to the pre_adjustment
section.

                                                    Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "If the causative research package does not meet the
prescribed thresholds IAW NAVSUPINST 4440.115G it does not
require causative research.";
```

```
RULE 8
IF      provide_directions = no OR
        provide_directions = yes AND
        cr_pkg_complete = no
THEN conclusion = conclusion_4
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Return causative research
package
to the originator to provide missing information.

                                                    Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "If causative research package is not complete, then
causative research can not be done.";

RULE 9
IF      provide_directions = no OR
        provide_directions = yes AND
        pre_adj = no
THEN conclusion = conclusion_5
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Return causative research
package
to the preadjustment section.

                                                    Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "If the response to either of the questions is YES, then

respond with YES.  If the response to both of the questions is
NO, then respond with NO.";
```

```
RULE 10
IF      provide_directions = no OR
        provide_directions = yes AND
        cr_pkg = yes AND
        cr_pkg_correct = yes AND
        cr_pkg_complete = yes AND
        pre_adj = yes AND
        cr_criteria = yes
THEN crp_go = yes
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Inventory adjustments
include
warehouse refusals and other adjustments resulting from physical
inventory
findings.

                                        Press ANY key to continue.~"

WCLOSE 1
ELSE    crp_go = no
BECAUSE "";
```

```
RULE 11
IF      crp_go = yes AND
        crp_type = inventory_adjustments AND
        cr_adj = yes
THEN conclusion = conclusion_6
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Find the package that has
already
been started and start entire procedure over again using the
already
started package.

WCLOSE 1                                                Press ANY key
to continue.~"
BECAUSE "
        crp_type: The program is trying to determine which
causative
research format to load.  Please be patient.  It takes a few
seconds.

        cr_adj: If any causative research adjustments have been
made, a
package has already been started.  To avoid duplication of
efforts, find
the package that has been started.
";

RULE 12
IF      crp_go = yes AND
        crp_type = inventory_adjustments AND
        cr_adj = no AND
        phys_count = yes
THEN whr_go = yes
DISPLAY ""
BECAUSE "The system's conclusion is:  If you do not have the count
cards,
you can not compare the physical count against the record
balance.";
```

```
RULE 13
IF      crp_go = yes AND
        crp_type = inventory_adjustments AND
        phys_count = no
THEN conclusion = conclusion_7
WOPEN 1,1,1,6,77,5
ACTIVE 1
        DISPLAY "The system's conclusion is:  Initiate a physical
count of
the material. When you receive the count cards start entire
procedure over
again.

                                                    Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "";


RULE 14
IF    crp_go = yes AND
      whr_go = yes AND
      msir_phys_count = yes
THEN whr_go_1 = yes
DISPLAY ""
BECAUSE "msir_phys_count: If the MSIR balance does not equal the

physical count you will probably be able to reverse a previous
adjustment. If the MSIR balance equals the physical count an
additional adjustment will probably be required.
";

RULE 15
IF    whr_go_1 = yes AND
      float = no
THEN whr_go_1_a = yes
DISPLAY ""
BECAUSE "float: Check the float to determine if there are any
issues or receipts that have either been physically made and not

processed to the records or have processed to the records but
have not been physically made.
";
```

```
RULE 16
IF    whr_go_1_a = yes AND
      tlod = no AND
      addl_aves_1 = yes
THEN conclusion = conclusion_8
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Adjust the records and
prepare a
survey if necessary.

                                          Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "TLOD: Check the TLOD to see if any issues or receipts
have failed to post to the MSIR or if any erroneous postings have

been made.

            addl_aves: To determine if these avenues helped
resolve the discrepancy.
";

RULE 17
IF    whr_go_1_a = yes AND
      tlod = no AND
      addl_aves_2 = yes
THEN conclusion = conclusion_9
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered
information to
reverse the previous adjustment and correct the records.

                                          Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 18
IF      whr_go_1_a = yes AND
        tlod = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_10
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial

information for remaining discrepancy prepare a survey if
necessary and
correct the records.

                                                Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 19
IF      whr_go_1_a = yes AND
        tlod = yes AND
        total_adj = yes
THEN conclusion = conclusion_11
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Reverse any adjustments to
correct
the record of the questioned item.

                                              Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "If the discovered TLOD information reconciles the entire
discrepancy the problem is solved; if it only reconciles a portion
of the
discrepancy then additional research is required.";
```

```
RULE 20
IF      whr_go_1_a = yes AND
        tlod = yes AND
        total_adj = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_12
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Reverse the inventory
adjustment for
the partial amount discovered in the TLOD and survey the remaining
amount
of the adjustment if necessary

                                                    Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 21
IF      whr_go_1_a = yes AND
        tlod = yes AND
        total_adj = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_13
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information
to reverse any adjustments and to correct the records

                                                    Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 22
IF      whr_go_1_a = yes AND
        tlod = yes AND
        total_adj = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_14
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Reverse any adjustments for
the
partial information discovered and survey the remaining amount of
the
adjustment if necessary.

                                                    Press  ANY  key  to

continue.~"
WCLOSE 1
BECAUSE "";

RULE 23
IF      whr_go_1 = yes
        and float = yes
THEN whr_go_1_b = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  "
BECAUSE "";

RULE 24
IF   whr_go_1_b = yes AND
     total_recon_float = yes
THEN conclusion = conclusion_15
     DISPLAY "Follow-up on the float and reverse the entire
inventory adjustment

                                                Press  ANY  key  to

continue.~"
WCLOSE 1
BECAUSE "If the discovered float information reconciles the
entire discrepancy the problem is solved; if it only reconciles

a portion of the discrepancy then additional research is
required.";
```

```
RULE 25
IF    whr_go_1_b = yes AND
      total_recon_float = no
THEN whr_go_1_b_1 = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  "
BECAUSE "";

RULE 26
IF    whr_go_1_b_1 = yes AND
      tlod = yes AND
      total_adj = yes
THEN conclusion = conclusion_16
      DISPLAY "Process discovered information to include follow up
on
partial information found in the float and reverse any
adjustments.

                                                Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 27
IF       whr_go_1_b_1 = yes AND
         tlod = yes
THEN whr_go_1_b_2 = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  "
BECAUSE "";
```

```
RULE 28
IF      whr_go_1_b_2 = yes AND
        total_adj = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_17
        DISPLAY "Process the discovered partial information,
reverse
the inventory adjustment, and survey the remaining amount of the

adjustment if necessary

                                                Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 29
IF      whr_go_1_b_2 = yes AND
        total_adj = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_18
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information
and reverse the entire inventory adjustment.

                                                Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 30
IF      whr_go_1_b_2 = yes AND
        total_adj = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_19
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
partial
information, reverse the inventory adjustment and survey the
remaining
amount of the adjustment if necessary.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 31
IF      whr_go_1_b_1 = yes AND
        tlod = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_20
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Reverse the inventory
adjustments
for the partial amount discovered in the float and survey the
remaining
amount of the adjustment if necessary.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 32
IF      whr_go_1_b_1 = yes AND
        tlod = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_21
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information
and reverse the entire inventory adjustment.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 33
IF      whr_go_1_b_1 = yes AND
        tlod = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_22
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
partial
information, reverse the inventory adjustment and survey the
remaining
amount if necessary.

                                              Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 34
IF      whr_go = yes AND
        msir_phys_count = no
THEN whr_go_2 = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  "
BECAUSE "";
```

```
RULE 35
IF      whr_go_2 = yes AND
        float = no
THEN whr_go_2_a = yes
        DISPLAY ""
BECAUSE "";

RULE 36
IF      whr_go_2_a = yes AND
        tlod = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_23
        DISPLAY "Prepare a survey if the dollar value justifies
it
and correct the records to compensate for the required inventory

adjustments

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 37
IF      whr_go_2_a = yes AND
        tlod = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_24
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information
and reverse the entire inventory adjustment.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 38
IF      whr_go_2_a = yes AND
        tlod = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_25
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information,
reverse the inventory adjustments for the partial amount
discovered, and
survey the remaining amount of the adjustment if necessary.

                                                Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 39
IF      whr_go_2_a = yes AND
        tlod = yes
THEN whr_go_2_a_1 = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  "
BECAUSE "";

RULE 40
IF      whr_go_2_a_1 = yes AND
        total_adj = yes
THEN conclusion = conclusion_26
        DISPLAY "Process the discovered information and reverse
the
inventory adjustment to correct the record of the questioned
item

                                              Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 41
IF      whr_go_2_a_1 = yes AND
        total_adj = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_27
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Reverse the inventory
adjustment for
the partial amount discovered in the TLOD and survey the remaining
amount
of the adjustment if necessary.

                                                    Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 42
IF      whr_go_2_a_1 = yes AND
        total_adj = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_28
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information
and reverse the entire inventory adjustment.

                                                    Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 43
IF      whr_go_2_a_1 = yes AND
        total_adj = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_29
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information,
reverse the inventory adjustment for the partial amount discovered
and
survey the remaining amount of the adjustment if necessary.

                                                    Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 44
IF      whr_go_2 = yes AND
        float = yes
THEN whr_go_2_b = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  "
BECAUSE "";

RULE 45
IF      whr_go_2_b = yes AND
        total_recon_float = yes
THEN conclusion = conclusion_30
        DISPLAY "Follow up on the float and reverse the entire
inventory adjustment

                                                  Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 46
IF      whr_go_2_b = yes AND
        total_recon_float = no
THEN whr_go_2_b_1 = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  "
BECAUSE "";

RULE 47
IF      whr_go_2_b_1 = yes AND
        tlod = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_31
        DISPLAY "Reverse the inventory adjustment for the partial

amount discovered in the float and survey the remaining amount of

the adjustment if necessary

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 48
IF      whr_go_2_b_1 = yes AND
        tlod = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_32
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Process the discovered
information
and reverse the entire inventory adjustment.

                                              Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 49
IF      whr_go_2_b_1 = yes AND
        tlod = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_33
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
partial
information, reverse the inventory adjustment and survey the
remaining
amount of the adjustment if necessary.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 50
IF      whr_go_2_b_1 = yes AND
        tlod = yes AND
        total_adj = yes
THEN conclusion = conclusion_34
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Follow up on the discovered
information and reverse the entire inventory adjustment.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 51
IF      whr_go_2_b_1 = yes AND
        tlod = yes AND
        total_adj = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_35
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Reverse the inventory
adjustment
for the partial amounts discovered and survey the remaining amount
of the
adjustment if necessary.

                                                    Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 52
IF      whr_go_2_b_1 = yes AND
        tlod = yes AND
        total_adj = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_36
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information
and reverse the entire inventory adjustment.

                                                    Press ANY key to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 53
IF      whr_go_2_b_1 = yes AND
        tlod = yes AND
        total_adj = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_37
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Reverse the inventory
adjustment
for the partial amounts discovered and survey the remaining amount
of the
adjustment if necessary.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 53A
IF      crp_type = DLA_material
THEN    crp_type = display_DLA_message
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Remember - when dealing with
DLA
items you can only process losses or gains, no inventory reversals

allowed !!!!
                                                Press  ANY  key  to
continue.~";


RULE 54
IF      crp_go = yes AND
        crp_type = DLA_material AND
        dla_request = yes
THEN dla = yes
        DISPLAY ""
BECAUSE "Causative research is only done on DLA material when a
DLA request
is received.";
```

```
RULE 55
IF      crp_go = yes AND
        crp_type = DLA_material AND
        dla_request = no
THEN conclusion = conclusion_38
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  A DLA request is required
before
doing causative research on DLA material.  Stop the process!

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 56
IF      dla = yes AND
        phys_count = yes
THEN dla_go = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY ""
BECAUSE "";

RULE 57
IF      dla = yes AND
        phys_count = no
THEN conclusion = conclusion_39
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "Initiate a physical count of the material  When the count
cards
are received, start the entire procedure over again.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 58
IF      dla_go = yes AND
        msir_phys_count = yes
THEN dla_go_1 = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY ""
BECAUSE "";

RULE 59
IF      dla_go_1 = yes AND
        phys_count_loss = yes
THEN dla_go_1_a = yes
        DISPLAY ""
BECAUSE "What is the problem cause: Is it a material shortage
problem or is
it a TIR problem between our records and DLA records?";

RULE 60
IF      dla_go_1_a = yes AND
        dla_float = yes AND
        total_recon_float = yes
THEN conclusion = conclusion_40
        DISPLAY "Follow up the float and notify DLA

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "Check the float to determine if there are any issues or

receipts that have either been physically made and not processed

to the records or have processed to the records but have not been

physically made.  Also consider possible TIR problems.";

RULE 61
IF      dla_go_1_a = yes AND
        dla_float = yes AND
        total_recon_float = no
THEN dla_go_1_a_2 = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  "
BECAUSE "";
```

```
RULE 62
IF      dla_go_1_a_2 = yes AND
        tlod = no
THEN conclusion = conclusion_41
        DISPLAY "Follow up on the partial information discovered
in
the float, make required adjustments for remaining discrepancy,

prepare survey if necessary, and notify DLA

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 63
IF      dla_go_1_a_2 = yes AND
        tlod = yes AND
        total_adj = yes
THEN conclusion = conclusion_42
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Follow up on the discovered
information and notify DLA.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 64
IF      dla_go_1_a_2 = yes AND
        tlod = yes AND
        total_adj = no
THEN conclusion = conclusion_43
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Follow up on the discovered
partial
information,  make  required  adjustments,  prepare  survey  if
necessary, and
notify DLA.

                                                    Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 65
IF      dla_go_1_a = yes AND
        dla_float = no
THEN dla_go_1_a1 = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY ""
BECAUSE "";

RULE 66
IF      dla_go_1_a1 = yes AND
        dla_tlod = no
THEN conclusion = conclusion_44
        DISPLAY "Notify DLA of unreconciled balance, adjust the

records, and prepare survey if necessary

                                                  Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "Check the TLOD to see if any issues or receipts have
failed to
pcst to the MSIR or if any erroneous postings have been made. Also

consider possible TIR problems.";
```

```
RULE 67
IF      dla_go_1_a1 = yes AND
        dla_tlod = yes AND
        dla_tlod_adj = yes
THEN conclusion = conclusion_45
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information
and notify DLA.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "If the discovered TLOD information reconciles the
entire discrepancy the problem is solved; if it only reconciles

a portion of the discrepancy then additional research is
required.";

RULE 68
IF      dla_go_1_a1 = yes AND
        dla_tlod = yes AND
        dla_tlod_adj = no
THEN conclusion = conclusion_46
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
partial
information, make required adjustments for remaining discrepancy,
prepare
survey if necessary, and notify DLA.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 69
IF      dla_go_1 = yes AND
        phys_count_loss = no AND
        dla_float = yes
THEN dla_go_1_b = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  "
BECAUSE "";

RULE 70
IF      dla_go_1_b = yes AND
        total_recon_float = yes
THEN conclusion = conclusion_47
        DISPLAY "Follow up the float and notify DLA

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 71
IF      dla_go_1_b = yes AND
        total_recon_float = no
THEN dla_go_1_b_1 = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  "
BECAUSE "";

RULE 72
IF      dla_go_1_b_1 = yes AND
        tlod = no
THEN conclusion = conclusion_48
        DISPLAY "Follow up the float, notify DLA concerning the

remaining discrepancy, and survey if necessary

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 73
IF      dla_go_1_b_1 = yes AND
        tlod = yes AND
        total_adj = no
THEN conclusion = conclusion_49
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
partial
information, notify DLA concerning the remaining discrepancy, and
survey
if necessary.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 74
IF      dla_go_1_b_1 = yes AND
        tlod = yes AND
        total_adj = yes
THEN conclusion = conclusion_50
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Follow up on the discovered
information and notify DLA.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 75
IF      dla_go_1 = yes AND
        phys_count_loss = no AND
        dla_float = no
THEN dla_go_1_c = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  "
BECAUSE "";
```

```
RULE 76
IF      dla_go_1_c = yes AND
        dla_tlod_1 = no
THEN conclusion = conclusion_51
        DISPLAY "Prepare survey if necessary and notify DLA of
the
discrepancy

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 77
IF      dla_go_1_c = yes AND
        dla_tlod_1 = yes
THEN dla_go_1_c_a = yes
DISPLAY ""
BECAUSE "To ensure all transactions are being recorded at your

activity and at DLA.";



RULE 78
IF      dla_go_1_c_a = yes AND
        dla_tlod_1_entire = yes
THEN conclusion = conclusion_52
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Adjust the records so that
they are
in balance and notify DLA.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "If the DLA transaction records provide information that

reconciles the entire discrepancy the problem is solved; if it
only
reconciles a portion of the discrepancy then additional research
is
required.";
```

```
RULE 79
IF      dla_go_1_c_a = yes AND
        dla_tlod_1_entire = no
THEN conclusion = conclusion_53
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Adjust the records for the
discovered
partial discrepancy, notify DLA and prepare survey if necessary.


                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 80
IF      dla = yes AND
        msir_phys_count = no
THEN dla_go_2 = yes
DISPLAY ""
BECAUSE "";

RULE 81
IF      dla_go_2 = yes AND
        float = yes
THEN dla_go_2_a = yes
        DISPLAY ""
BECAUSE "";

RULE 82
IF      dla_go_2_a = yes AND
        total_recon_float = no AND
        tlod = no
THEN conclusion = conclusion_54
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "Follow up the float and notify DLA concerning the
remaining discrepancy.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 83
IF      dla_go_2_a = yes AND
        total_recon_float = no AND
        tlod = yes
THEN dla_go_2_b = yes
DISPLAY ""
BECAUSE "";

RULE 84
IF      dla_go_2_a = yes AND
        total_recon_float = yes
THEN conclusion = conclusion_55
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "Follow up the float and notify DLA.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 85
IF      dla_go_2 = yes AND
        float = no
THEN dla_go_2_b = yes
DISPLAY ""
BECAUSE "";

! rule-87
RULE 86
IF      dla_go_2_b = yes AND
        tlod = no
THEN conclusion = conclusion_56
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "Make required adjustment, survey if necessary, and notify
DLA
of discrepancy.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

! rule-88
```

```
RULE 87
IF      dla_go_2_b = yes AND
        tlod = yes AND
        total_adj = yes
THEN conclusion = conclusion_57
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information
to correct the records and notify DLA.

                                          Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";


! rule-89
RULE 88
IF      dla_go_2_b = yes AND
        tlod = yes AND
        total_adj = no
THEN conclusion = conclusion_58
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
partial
information, notify DLA and prepare survey if necessary.

                                          Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";


!   The following section contains the rules that analyze the
!    classified/pilferable/sensitive material causative research

!   requirements.


! rule-90
```

```
RULE 89
IF      crp_go = yes AND
        crp_type = classfied_pilferable_sensitivematerial AND
        cps_codes_known = yes AND
        ver_sec_code = yes
THEN cps_go = yes
DISPLAY ""
BECAUSE "To ensure the item is classified, pilferable, or
sensitive.";



!rule-91:
RULE 89A
IF cps_codes_info = yes
THEN understand_cps_codes = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  The description of cps codes
will be
skipped.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "
";



! rule-92:
```

```
RULE 89B
IF   cps_codes_info = no
THEN cps_codes_explained = yes
WOPEN 1,1,1,19,77,5
ACTIVE 1
DISPLAY "                    SECURITY AND PILFERABLE CODES

CODE    DESCRIPTION - SECURITY ITEMS

  A     Conf - formerly restricted data
  B     Conf - restricted data
  C     Conf
  D     Conf - cryptologic
  E     Secret - cryptologic
  F     Top Secret - cryptologic
  G     Secret - formerly restricted data
  H     Secret - restricted data
  S     Secret
  K     Top Secret - formerly restricted data
  L     Top Secret - restricted data
  T     Top Secret

              Press ANY key to see the rest of the list.~"
WCLOSE 1
WOPEN 1,1,1,18,77,5
ACTIVE 1
DISPLAY "CODE    DESCRIPTION - PILFERABLE ITEMS
  J     (If assigned by the activity)
  M     Hand tools and shop equipment
  N     Fire Arms
  P     Ammunition and explosives
  Q     Drug or substance as determined by DEA
  R     Alcohol, precious metals or drug/substance as
        determined by DEA
  V     Individual clothing and/or equipment
  W     Office machines
  X     Photographic equipment and supplies
  Y     Communications/electronic equipment and parts
  Z     Vehicular equipment and parts
  I     Aircraft engine equipment and parts

                                    Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 89C
IF      cps_codes_explained = yes OR
        understand_cps_codes = yes
THEN cps_codes_known = yes
        DISPLAY "" .
BECAUSE "";


RULE 90
IF      crp_go = yes AND
        crp_type = classfied_pilferable_sensitivematerial AND
        cps_codes_known = yes AND
        ver_sec_code = no
THEN conclusion = conclusion_59
WOPEN 1,1,1,6,77,5
ACTIVE 1
        DISPLAY "This is not a controlled item.  If the item meets

some other criteria for causative research, utilize that
procedure. Otherwise, stop the causative research process

                                                Press   ANY   key   to

continue.~"
WCLOSE 1
BECAUSE "";

RULE 91
IF      cps_go = yes AND
        phys_count = yes
THEN cps_go_1 = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY ""
BECAUSE "";
```

```
RULE 92
IF      cps_go = yes AND
        phys_count = no
THEN conclusion = conclusion_60
WOPEN 1,1,1,5,77,5
ACTIVE 1
        DISPLAY "Initiate a physical count of the material. When
the
count cards are received start the entire procedure over again

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 93
IF      cps_go_1 = yes AND
        ver_request_type = pre_adjustment AND
        adj = no AND
        float = yes
THEN cps_go_1_a = yes
DISPLAY ""
BECAUSE "ver-request-type: The resulting actions are different
depending on the origin of the source; for example, for an item

with a 0 adjustment, pre-adjustment requests require documented

actions while memo requests do not.

adj: If the pre-adjustment section solved the problem all that is

required is to verify their procedures; otherwise additional
research is required.";


RULE 94
IF      cps_go_1 = yes AND
        ver_request_type = pre_adjustment AND
        adj = no AND
        float = no
THEN cps_go_2 = yes
DISPLAY ""
BECAUSE "";
```

```
RULE 95
IF      cps_go_1 = yes AND
        ver_request_type = pre_adjustment AND
        adj = yes
THEN conclusion = conclusion_61
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "The system's conclusion is:   Verify pre-adjustment
procedures and
make recommended adjustments.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 96
IF      cps_go_1 = yes AND
        float = yes
THEN cps_go_1_a = yes
DISPLAY ""
BECAUSE "";

RULE 97
IF      cps_go_1_a = yes AND
        float_res_disc = yes AND
        total_recon_float = yes
THEN conclusion = conclusion_62
WOPEN 1,1,1,5,77,7
ACTIVE 1
DISPLAY "The system's conclusion is:  Follow up on the float to
ensure the
records are corrected and submit a summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "Since there is float associated with this problem,
check for transaction paperwork attached to the material in the

locations to assist with the research.  This additional step is

necessary for controlled material.";
```

```
RULE 98
IF      cps_go_1_a = yes AND
        float_res_disc = yes AND
        total_recon_float = no
THEN cps_go_1_a1 = yes
DISPLAY ""
BECAUSE "";

RULE 99
IF      cps_go_1_a = yes AND
        float_res_disc = no
THEN cps_go_1_a1 = yes
        DISPLAY ""
BECAUSE "";

RULE 100
IF      cps_go_1_a1 = yes AND
        tlod = yes
THEN cps_go_1_a2 = yes
        DISPLAY ""
BECAUSE "";

RULE 101
IF      cps_go_1_a2 = yes AND
        total_adj = yes
THEN conclusion = conclusion_63
WOPEN 1,1,1,5,77,5
ACTIVE 1
        DISPLAY "Process the discovered information to ensure the

records are corrected and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 102
IF      cps_go_1_a1 = yes AND
        tlod = no
THEN cps_go_1_a3 = yes
DISPLAY ""
BECAUSE "";
```

```
RULE 103
IF      cps_go_1_a2 = yes AND
        total_adj = no
THEN cps_go_1_a3 = yes
        DISPLAY ""
BECAUSE "";

RULE 104
IF      cps_go_1_a3 = yes AND
        kardex_count_tlod = yes AND
        addl_aves_1 = yes
THEN conclusion = conclusion_64
WOPEN 1,1,1,5,77,5
ACTIVE 1
        DISPLAY "Process discovered  partial information, prepare

MLSR and survey if necessary, and submit summary

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "To determine if this is a quantity discrepancy or a
problem with posting the records.";

RULE 105
IF      cps_go_1_a3 = yes AND
        kardex_count_tlod = yes AND
        addl_aves_2 = yes
THEN conclusion = conclusion_65
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process partial discovered

information prepare MLSR and survey if necessary, and submit
summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 106
IF      cps_go_1_a3 = yes AND
        kardex_count_tlod = yes AND
        addl_aves_3 = yes
THEN conclusion = conclusion_66
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information,
prepare MLSR and survey if necessary, and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 107
IF      cps_go_1_a3 = yes AND
        kardex_count_tlod = no
THEN cps_go_1_a4 = yes
DISPLAY ""
BECAUSE "";
```

```
RULE 108
IF      addl_aves_info = no AND
        addl_aves_info_cont = continue
THEN addl_aves_explained = yes
WOPEN 1,1,1,22,77,5
ACTIVE 1
DISPLAY "
                              Such avenues are:

            1. GBLs,
            2. call the shipping IM,
            3. check paperwork in the storage bins,
            4. check with commands that recently received an issue
of
               the item to see how many they received,
            5. check the ROD file,
            6. check all condition codes and all locations,
            7. check staging or frustrated material areas,
            8. was it a 'hot item' that came straight out of repair

               to a customer without the proper documentation,
            9. check recent change notices for unit of issue or
unit
               pack changes,
           10. look for recent warehouse or customer refusals,
           11. check previous causative research packages on this
item
               for adjustment causes.


                                        Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "To provide a list of some other areas to be reviewed to

assist with the research.";
```

```
RULE 109
IF      addl_aves_info = yes
THEN understand_addl_aves = yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY ""
BECAUSE "";

RULE 110
IF      addl_aves_explained = yes OR
        understand_addl_aves = yes
THEN addl_aves_known = yes
        DISPLAY ""
BECAUSE "";


RULE 111
IF      addl_aves_known = yes AND
        addl_aves = no
THEN addl_aves_1 = yes
        DISPLAY ""
BECAUSE "";

RULE 112
IF      addl_aves_known = yes AND
        addl_aves = yes AND
        addl_aves_total_adj = yes
THEN addl_aves_2 = yes
        DISPLAY ""
BECAUSE "addl-aves-total-adj: If the additional avenues provide
information
that reconciles the entire discrepancy the problem is solved; if
it only
reconciles a portion of the discrepancy then additional research
is
required.";


RULE 113
IF      addl_aves_known = yes AND
        addl_aves = yes AND
        addl_aves_total_adj = no
THEN addl_aves_3 = yes
DISPLAY ""
BECAUSE "";
```

```
RULE 114
IF      cps_go_1_a4 = yes AND
        float_cardex_count_tlod = equal
THEN conclusion = conclusion_67
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "Process the discovered information to ensure the records
post
correctly and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE
"float_cardex_count_tlod: To determine whether the floa. corrects
the
entire problem or if additional research is required.";

RULE 900
IF      cps_go_1_a4 = yes AND
        float_cardex_count_tlod = not_equal AND
        addl_aves_1 = yes
THEN conclusion = conclusion_68
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
partial
information, prepare the MLSR and survey if necessary, and submit
summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 115
IF      cps_go_1_a4 = yes AND
        float_cardex_count_tlod = not_equal AND
        addl_aves_2 = yes
THEN conclusion = conclusion_69
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Process the discovered
information
and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 116
IF      cps_go_1_a4 = yes AND
        float_cardex_count_tlod = not_equal AND
        addl_aves_3 = yes
THEN conclusion = conclusion_70
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY  "The  system's  conclusion  is:    Process  the  partial
information
discovered and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 119
IF      cps_go_1 = yes AND
        float = no
THEN cps_go_2 = yes
DISPLAY ""
BECAUSE "";

RULE 120
IF      cps_go_2 = yes AND
        tlod = no
THEN cps_go_2_a = yes
        DISPLAY ""
BECAUSE "";
```

```
RULE 121
IF      cps_go_2_a = yes AND
        addl_aves_known = yes AND
        addl_aves = no
THEN conclusion = conclusion_71
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "Process the adjustment, prepare the survey and MLSR, and
submit
summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 122
IF      cps_go_2_a = yes AND
        addl_aves = yes AND
        addl_aves_known = yes AND
        addl_aves_total_adj = yes
THEN conclusion = conclusion_72
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY  "The  system's  conclusion  is:    Process  discovered
information to
correct the records and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 123
IF      cps_go_2_a = yes AND
        addl_aves = yes AND
        addl_aves_known = yes AND
        addl_aves_total_adj = no
THEN conclusion = conclusion_73
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process partial discovered

information, process partial adjustment, prepare MLSR and survey
if
necessary, and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 124
IF      cps_go_2 = yes AND
        tlod = yes
THEN cps_go_2_b = yes
DISPLAY ""
BECAUSE "";

RULE 125
IF      cps_go_2_b = yes AND
        count_kardex = no AND
        ver_request_type = memo
THEN conclusion = conclusion_74
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "Inform originator that no adjustment is required.


                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE
"count-kardex:  To  determine  if  the  problem  is  a  quantity
discrepancy or
a failure of the custodian to correctly post his Kardex.";
```

```
RULE 126
IF      cps_go_2_b = yes AND
        count_kardex = no AND
        ver_request_type = pre_adjustment
THEN conclusion = conclusion_75
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Document that no adjustment
is
required.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 127
IF      cps_go_2_b = yes AND
        count_kardex = yes AND
        tlod_cardx_count = yes
THEN cps_go_2_b1 = yes
DISPLAY ""
BECAUSE "tlod-cardx-count: To ensure that all the transactions
have correctly posted to the automated records.";
```

```
RULE 128
IF      cps_go_2_b1 = yes AND
        tlod_cardx = greater
THEN conclusion = conclusion_76
WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Update and correct TLOD and
Kardex.
This is only a discrepancy on the records, not a physical
discrepancy.
This discrepancy was probably caused by:

       1.  Receipts processed to MSIR but not to Kardex.
       2.  Duplicate issues on Kardex.
       3.  Issues made on Kardex not processed to TLOD.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "tlod-cardx: To determine the relative size of the
discrepancy between the automated and manual records.";



RULE 129
IF      cps_go_2_b1 = yes AND
        tlod_cardx = less_than
THEN conclusion = conclusion_77
WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Update and correct TLOD and
Kardex.
This is only a discrepancy on the records, not a physical
discrepancy.
This discrepancy was probably caused by:

          1.  Receipts not processed to TLOD.
          2.  TLOD includes erroneous or duplicate issues.
          3.  Issues processed through records but not physically
made.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 130
IF      cps_go_2_b = yes AND
        count_kardex = yes AND
        tlod_cardx_count = no
THEN cps_go_2_b2 = yes
DISPLAY ""
BECAUSE "";

RULE 131
IF      cps_go_2_b2 = yes AND
        count_tlod = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_78
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "Process discovered partial information, prepare survey
and MLSR,
and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "count-tlod: to determine if the problem is a quantity
discrepancy or a failure of a transaction to post to the
automated records.";


RULE 132
IF      cps_go_2_b2 = yes AND
        count_tlod = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_79
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY  "The  system's  conclusion  is:    Process  discovered
information to
correct the records.

                                              Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 133
IF      cps_go_2_b2 = yes AND
        count_tlod = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_80
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information;
for remaining discrepancy process adjustment, prepare MLSR and
survey if
necessary, and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 134
IF      cps_go_2_b2 = yes AND
        count_tlod = yes AND
        count_tlod_diff = equal_to
THEN conclusion = conclusion_81
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY  "The  system's  conclusion  is:    Process  discovered
information and
submit summary. If memo request inform originator of resolution.


                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "count-tlod-diff: To determine the relative size of the

discrepancy between the automated and manual records.";
```

```
RULE 135
IF      cps_go_2_b2 = yes AND
        count_tlod = yes AND
        count_tlod_diff = greater_than AND
        addl_aves_1 = yes
THEN conclusion = conclusion_82
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Prepare GBI survey and MLSR,
process
full discrepancy with DOCID ZRQ and then use DOCID ZAT to correct
the
MSIR.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 136
IF      cps_go_2_b2 = yes AND
        count_tlod = yes AND
        count_tlod_diff = greater_than AND
        addl_aves_2 = yes
THEN conclusion = conclusion_83
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY  "The  system's  conclusion  is:    Process  discovered
information to
correct records and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 137
IF      cps_go_2_b2 = yes AND
        count_tlod = yes AND
        count_tlod_diff = greater_than AND
        addl_aves_3 = yes
THEN conclusion = conclusion_84
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial

information; for remaining discrepancy process adjustment, prepare
MLSR
and survey if necessary, and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 138
IF      cps_go_2_b2 = yes AND
        count_tlod = yes AND
        count_tlod_diff = less_than AND
        addl_aves_1 = yes
THEN conclusion = conclusion_85
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  For remaining discrepancy
prepare
MLSR, survey if necessary and adjust MSIR.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 139
IF      cps_go_2_b2 = yes AND
        count_tlod = yes AND
        count_tlod_diff = less_than AND
        addl_aves_2 = yes
THEN conclusion = conclusion_86
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:    Process discovered
information to
correct the records.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 140
IF      cps_go_2_b2 = yes AND
        count_tlod = yes AND
        count_tlod_diff = less_than AND
        addl_aves_3 = yes
THEN conclusion = conclusion_87
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY
"The system's conclusion is:    Process discovered partial
information; for
remaining discrepancy process adjustment, prepare survey if
necessary and
MLSR, and submit summary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 141
IF      crp_go = yes AND
        crp_type = delayed_receipt_or_0_stow AND
        d9a = not_valid AND
        msir_correct = yes
THEN conclusion = conclusion_88
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY
"The system's conclusion is:  Causative research completed.
Reverse D9A
with DOCID ZAT and stop procedure.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "d9a: If D9A is valid, full causative research is
required;
if D9A is not valid, then corrective action is to validate MSIR
balance.

msir-correct: Since D9A was not valid this is to determine
corrective MSIR action.";


RULE 142
IF      crp_go = yes AND
        crp_type = delayed_receipt_or_0_stow AND
        d9a = not_valid AND
        msir_correct = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_89
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY
"The system's conclusion is:  Reverse D9A, correct the MSIR with
DOCID ZRD
and survey if necessary.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 901
IF      crp_go = yes AND
        crp_type = delayed_receipt_or_0_stow AND
        d9a = not_valid AND
        msir_correct = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_90
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY
"The system's conclusion is:  Process the discovered information
and
reverse D9A.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 902
IF      crp_go = yes AND
        crp_type = delayed_receipt_or_0_stow AND
        d9a = not_valid AND
        msir_correct = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_91
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY
"The  system's  conclusion  is:    Process  discovered  partial
information to
correct the MSIR, reverse D9A and survey.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 143
IF      crp_go = yes AND
        crp_type = delayed_receipt_or_0_stow AND
        d9a = valid AND
        msir_phys_count = yes
THEN dr_go_1 = yes
DISPLAY ""
BECAUSE "";

RULE 144
IF      dr_go_1 = yes AND
        float = no
THEN dr_go_1_a = yes
        DISPLAY ""
BECAUSE "";

RULE 145
IF      dr_go_1_a = yes AND
        tlod = no AND
        receipt_matl_missid = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_92
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY
"Process DOCID ZAT 0 adjustment and prepare survey if necessary.


                                        Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "receipt-matl-missid: To determine if a previously posted

receipt was accurately identified and posted to the automated
records.";
```

```
RULE 146
IF      dr_go_1_a = yes AND
        tlod = no AND
        receipt_matl_missid = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_93
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY
"The system's conclusion is:  Process discovered information and
reverse
D9A to correct the records.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 147
IF      dr_go_1_a = yes AND
        tlod = no AND
        receipt_matl_missid = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_94
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY
"The  system's  conclusion  is:    Process  discovered  partial
information to
reverse partial D9A and survey remaining discrepancy if necessary.


                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 148
IF      dr_go_1_a = yes AND
        tlod = yes AND
        total_adj = yes
THEN conclusion = conclusion_95
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY
"The system's conclusion is:  Reverse the D9A with appropriate
error code.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 149
IF      dr_go_1_a = yes AND
        tlod = yes AND
        total_adj = no
THEN dr_go_1_a1 = yes
DISPLAY ""
BECAUSE "";

RULE 150
IF      dr_go_1_a1 = yes AND
        receipt_matl_missid = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_96
WOPEN 1,1,1,5,77,5
ACTIVE 1
        DISPLAY "Process partial information discovered to reverse

partial D9A and survey remaining discrepancy if necessary

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 151
IF      dr_go_1_a1 = yes AND
        receipt_matl_missid = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_97
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY
"The system's conclusion is:  Process discovered information to
reverse D9A.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 152
IF      dr_go_1_a1 = yes AND
        receipt_matl_missid = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_98
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY
"The system's conclusion is:  Process partial information
discovered to
reverse partial D9A and survey remaining discrepancy if necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 153
IF      dr_go_1_a1 = yes AND
        receipt_matl_missid = yes
THEN conclusion = conclusion_99
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process partial information
discovered in
TLOD. For remaining discrepancy, reverse D9A, reprocess for
correct
receipt and investigate new NSN

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";



RULE 154
IF      dr_go_1_a = yes AND
        receipt_matl_missid = yes
THEN conclusion = conclusion_100
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Reverse D9A and ZRD,
reprocess for
correct receipt and investigate new quantity and NSN received.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 155
IF      dr_go_1 = yes AND
        float = yes AND
        total_recon_float = no
THEN dr_go_1_b = yes
DISPLAY ""
BECAUSE "";
```

```
RULE 156
IF      dr_go_1 = yes AND
        float = yes AND
        total_recon_float = yes
THEN conclusion = conclusion_101
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "Follow up on the discovered float to ensure records post
properly and
reverse the D9A.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 157
IF      dr_go_1_b = yes AND
        tlod = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_102
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Reverse D9A for partial
quantity
discovered in float with appropriate error code and prepare survey
if
necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 158
IF      dr_go_1_b = yes AND
        tlod = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_103
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information and
reverse the D9A with appropriate error code.

                                          Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 159
IF      dr_go_1_b = yes AND
        tlod = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_104
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information, adjust records
for remaining discrepancy, reverse D9A and prepare survey if
necessary.

                                          Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 160
IF      dr_go_1_b = yes AND
        tlod = yes
THEN dr_go_1_b1 = yes
DISPLAY ""
BECAUSE "";
```

```
RULE 161
IF      dr_go_1_b1 = yes AND
        total_adj = yes
THEN conclusion = conclusion_105
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:    Process discovered
information and
reverse D9A with error code 8.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 162
IF      dr_go_1_b1 = yes AND
        total_adj = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_106
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information,
adjust shortage as LBI, reverse D9A and survey if necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 163
IF      dr_go_1_b1 = yes AND
        total_adj = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_107
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
information and
reverse the D9A.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 164
IF      dr_go_1_b1 = yes AND
        total_adj = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_108
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information,
reverse D9A with the appropriate error code and survey if
necessary.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 165
IF      crp_go = yes AND
        crp_type = delayed_receipt_or_0_stow AND
        d9a = valid AND
        msir_phys_count = no
THEN dr_go_2 = yes
DISPLAY ""
BECAUSE "";
```

```
RULE 166
IF      dr_go_2 = yes AND
        float = yes
THEN dr_go_2_a = yes
        DISPLAY ""
BECAUSE "";

RULE 167
IF      dr_go_2_a = yes AND
        receipt = greater_than AND
        tlod = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_109
DISPLAY "Process discovered partial information, reverse D9A with
appropriate
error code,adjust excess as GBI and prepare survey if necessary.


                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "receipt: To determine the relative size of the
discrepancy between the quantities of the float and the D9A.
";

RULE 168
IF      dr_go_2_a = yes AND
        receipt = greater_than AND
        tlod = yes
THEN dr_go_2_a1 = yes
DISPLAY ""
BECAUSE "";

RULE 169
IF      dr_go_2_a1 = yes AND
        total_adj = no
THEN dr_go_2_a2 = yes
        DISPLAY ""
BECAUSE "";
```

```
RULE 170
IF      dr_go_2_a = yes AND
        receipt = greater_than AND
        tlod = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_110
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "Reverse D9A with appropriate error code and process
discovered
information to correct the records.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 171
IF      dr_go_2_a = yes AND
        receipt = greater_than AND
        tlod = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_111
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Reverse D9A with appropriate
error
code,  process  discovered  partial  information  to  correct  the
records, adjust
remaining excess as GBI and prepare survey if necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 172
IF      dr_go_2_a = yes AND
        receipt = equal_to
THEN conclusion = conclusion_112
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Follow up the float and
reverse D9A with
appropriate error code.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 173
IF      dr_go_2_a = yes AND
        receipt = less_than AND
        tlod = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_113
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Follow up the float, reverse
D9a with
appropriate error code and prepare survey if necessary.

                                                Press  ANY  key  to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 174
IF      dr_go_2_a = yes AND
        receipt = less_than AND
        tlod = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_114
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:    Process discovered
information and
reverse D9A with appropriate error code.

                                              Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 175
IF      dr_go_2_a = yes AND
        receipt = less_than AND
        tlod = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_115
WOPEN   1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information,
reverse D9A with appropriate error code and prepare survey if
necessary.

                                              Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 176
IF      dr_go_2_a = yes AND
        receipt = less_than AND
        tlod = yes
THEN dr_go_2_a3 = yes
DISPLAY ""
BECAUSE "";
```

```
RULE 177
IF      dr_go_2_a1 = yes AND
        total_adj = yes
THEN conclusion = conclusion_116
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "Process the discovered information and reverse the D9A.


                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 801
IF      dr_go_2_a3 = yes AND
        total_adj = yes
THEN conclusion = conclusion_117
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Process the discovered
information and
reverse the D9A.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 178
IF      dr_go_2_a2 = yes AND
        addl_aves_1 = yes
THEN conclusion = conclusion_118
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information,
reverse D9A and survey remaining discrepancy if necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 802
IF      dr_go_2_a4 = yes AND
        addl_aves_1 = yes
THEN conclusion = conclusion_119
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information
against D9A and survey remaining discrepancy if necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 179
IF      dr_go_2_a2 = yes AND
        addl_aves_2 = yes
THEN conclusion = conclusion_120
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY  "The  system's  conclusion  is:    Process  discovered
information and
reverse D9A with appropriate error code to correct the records.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 803
IF      dr_go_2_a4 = yes AND
        addl_aves_2 = yes
THEN conclusion = conclusion_121
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY  "The  system's  conclusion  is:    Process  discovered
information and
reverse D9A with appropriate error code to correct the records.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 180
IF      dr_go_2_a2 = yes AND
        addl_aves_3 = yes
THEN conclusion = conclusion_122
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information,
reverse D9A and survey remaining discrepancy if necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 804
IF      dr_go_2_a4 = yes AND
        addl_aves_3 = yes
THEN conclusion = conclusion_123
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information,
reverse D9A and survey remaining discrepancy if necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 181
IF      dr_go_2_a3 = yes AND
        total_adj = no
THEN    dr_go_2_a4 = yes
DISPLAY ""
BECAUSE "";

RULE 182
IF      dr_go_2 = yes AND
        float = no
THEN dr_go_2_b = yes
       DISPLAY ""
BECAUSE "";
```

```
RULE 183
IF      dr_go_2_b = yes AND
        tlod = yes AND
        receipt_tlod = equal_to
THEN conclusion = conclusion_124
WOPEN 1,1,1,6,77,5
ACTIVE 1
DISPLAY "Process information discovered in the TLOD, reverse D9A
and if the
problem was identified use error code 8, if the problem was not
identified
use error code 9.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "receipt-tlod: To determine the relative size of the
discrepancy between the information on the TLOD and the D9A.";



RULE 184
IF      dr_go_2_b = yes AND
        tlod = yes AND
        receipt_tlod = greater_than AND
        addl_aves_1 = yes
THEN conclusion = conclusion_125
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Reverse D9A with appropriate
error
code, adjust excess as GBI and prepare survey if necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 185
IF      dr_go_2_b = yes AND
        tlod = yes AND
        receipt_tlod = greater_than AND
        addl_aves_2 = yes
THEN conclusion = conclusion_126
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:    Process discovered
information and
reverse D9A with appropriate error code.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 186
IF      dr_go_2_b = yes AND
        tlod = yes AND
        receipt_tlod = greater_than AND
        addl_aves_3 = yes
THEN conclusion = conclusion_127
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Reverse D9A with appropriate
error
code,  adjust  remaining  excess  as  GBI  and  prepare  survey  if
necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 187
IF      dr_go_2_b = yes AND
        tlod = yes AND
        receipt_tlod = less_than
THEN dr_go_2_c = yes
DISPLAY ""
BECAUSE "";
```

```
RULE 188
IF      dr_go_2_b = yes AND
        tlod = no AND
        addl_aves_1 = yes
THEN conclusion = conclusion_128
WOPEN 1,1,1,5,77,5
ACTIVE 1
DISPLAY "Process DOCID ZAT 0 adjustment and prepare survey if
necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 189
IF      dr_go_2_b = yes AND
        tlod = no AND
        addl_aves_2 = yes
THEN conclusion = conclusion_129
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Process the discovered
information and
reverse the D9A.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 190
IF      dr_go_2_b = yes AND
        tlod = no AND
        addl_aves_3 = yes
THEN conclusion = conclusion_130
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process the discovered
partial
information, reverse the D9A, and prepare survey for the remaining

discrepancy if necessary.

                                                    Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 191
IF      dr_go_2_c = yes AND
        addl_aves_1 = yes AND
        high = yes
THEN conclusion = conclusion_131
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information,
reverse D9A with error code 8 if reason for discrepancy is known
and prepare
survey if necessary.

                                                    Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
RULE 192
IF      dr_go_2_c = yes AND
        addl_aves_2 = yes
THEN conclusion = conclusion_132
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY  "The  system's  conclusion  is:    Process  discovered
information and
reverse D9A with appropriate error code.

                                              Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 193
IF      dr_go_2_c = yes AND
        addl_aves_3 = yes AND
        high = yes
THEN conclusion = conclusion_133
WOPEN 1,1,1,6,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information,
reverse D9A with error code 8 if reason for discrepancy is known
and prepare
survey if necessary.

                                              Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";

RULE 194
!IF     recovered-receipt = HIGH AND
!          HIGH > 49
!          THEN high = yes
IF      recovered_receipt > 49
THEN high = yes
DISPLAY ""
BECAUSE "recovered-receipt: The percentage of the discrepancy
discovered dictates the appropriate error code to use.";
```

```
RULE 195
IF      dr_go_2_c = yes AND
        addl_aves_1 = yes AND
        high = no                       ! not high
THEN conclusion = conclusion_134
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information,
reverse D9A with error code 9 and prepare survey if necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";


RULE 196
IF      dr_go_2_c = yes AND
        addl_aves_3 = yes AND
        high = yes
THEN conclusion = conclusion_135
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process discovered partial
information,
reverse D9A with error code 9 and prepare survey if necessary.

                                                Press   ANY   key   to
continue.~"
WCLOSE 1
BECAUSE "";
```

```
! RULE 197 is  a rule that is designed to catch any
! situations not in the rule base.
! The assumption with the variable 'cant_find_answer' is
! that if the user gets asked this question, the rule base
! was unable to match all of the user responses to a rule.


RULE 197
IF      cant_find_answer = Return_to_Main_Program
THEN conclusion = conclusion_136
WOPEN 1,1,1,16,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:



      !!!!   SORRY    !!!!    SORRY    !!!!    SORRY    !!!!

        THE RULE BASE DOES NOT HAVE THE RULE(S) THAT MATCH THE
        ANSWERS YOU GAVE TO THE SYSTEM. PLEASE SEE YOUR
        SUPERVISOR FOR ASSISTANCE IN RESOLVING THE PROBLEM. I
        APOLOGIZE FOR THE INCONVENIENCE.



                        Press ANY key to continue.~"
WCLOSE 1;



ASK cps_codes_info: "Do you know what the security and pilferable

codes are?

        If you do not know what the codes are the list of them
from NAVSUP P-437 will be displayed, if you do know what the
codes are this step will be skipped.
";

CHOICES cps_codes_info: Yes, no;
```

```
ASK ready_to_go_on: "Are you ready to go on with the program?
";
CHOICES ready_to_go_on: Yes, No;


ASK directions: "Would you like directions on how to use this
program?
";
CHOICES directions: yes,no;

ASK directions_cont: "Enter 'continue' when you are ready
to see the rest of the directions?
";
CHOICES directions_cont: continue;


ASK cr_pkg: "Do you have a causative research package?
";
CHOICES cr_pkg: yes,no;

ASK cr_pkg_correct: "Is the causative research package
correct?  Check things such as the extensions, security codes,
etc.
";
CHOICES cr_pkg_correct: yes,no;

ASK cr_thresholds_info: "Do you know what the
causative research thresholds are?
";
CHOICES cr_thresholds_info: yes, no;

ASK cr_thresholds_info: "Do you know what the
causative research thresholds are?
";
CHOICES cr_thresholds_info: yes, no;

ASK cr_criteria_ok: "Does the causative research package
meet all the required criteria and thresholds?
";
CHOICES cr_criteria_ok: yes, no;
```

```
ASK cr_pkg_complete: "Is the causative research package
complete?  Check things like TLOD, count
cards, pre_adjustment reconciliations
(ZDGs), information about the count to
determine if the physical count was accurate, etc.
";
CHOICES cr_pkg_complete: yes, no;

ASK pre_adj: "Have any adjustments been made to the
causative research package?  Or is this a
classified, pilferable or sensitive item?
";
CHOICES pre_adj: yes, no;

ASK crp_type: "What type of causative research package is this?";

CHOICES crp_type: inventory_adjustments,
delayed_receipt_or_0_stow,
classfied_pilferable_sensitivematerial, DLA_material;

ASK cr_adj: "Have any causative research adjustments
already been made to this package?
Adjustments like ZAT or ZAX for all or a portion of the
discrepancy.
";
CHOICES cr_adj: yes, no;

ASK phys_count: "Has a physical count of the material been
conducted and do you have the count cards?
";
CHOICES phys_count: yes, no;

ASK msir_phys_count: "Does the MSIR balance equal the physical
count balance?  DOCID XXD provides MSIR
information such as locations, on_hand
quantity, etc., to compare with the physical count.
";
CHOICES msir_phys_count: yes, no;
```

```
ASK float: "Is there any 'float' on the item
that reconciles the discrepancy?  In researching the float check

for in-process issues or receipts, ZELs, condition code problems,

and MTIS.
";
CHOICES float: yes, no;

ASK tlod:
"Does the TLOD reveal any discrepancies that explain the
unreconciled
balance? Check one year's transactions or back to the date of the
last
inventory, whichever is first.";
CHOICES tlod: yes, no;

ASK total_adj: "Does the discovered TLOD discrepancy
reconcile the entire/remaining amount of
the adjustment of the questioned item?
";
CHOICES total_adj: yes, no;

ASK total_recon_float: "Does the float reconcile the entire
amount of the item in question?
";
CHOICES total_recon_float: yes, no;

ASK dla_request: "Has DLA requested
causative research on the DLA material?
";
CHOICES dla_request: yes, no;

ASK phys_count_loss: "If the physical count equals the MSIR
does it 'find' the questioned RCN?
";
CHOICES phys_count_loss: yes, no;

ASK dla_float: "Even though the MSIR equals the physical
count, does the 'float' reveal other
transactions that cause the count to equal
the MSIR when they should not be equal?
";
CHOICES dla_float: yes, no;
```

```
ASK dla_tlod: "Even though the MSIR equals the physical
count, does the 'TLOD check' reveal other
discrepancies that cause the count to
equal the MSIR when they are not equal?
";
CHOICES dla_tlod: yes, no;

ASK dla_tlod_adj: "Does the information found in the TLOD
reconcile the entire discrepancy?
";
CHOICES dla_tlod_adj: yes, no;

ASK dla_tlod_1: "Compare DLA transaction records with your
transaction records. Can you reconcile the discrepancy?
";
CHOICES dla_tlod_1: yes, no;

ASK dla_tlod_1_entire: "Do the DLA transaction records
reconcile the entire discrepancy?
";
CHOICES dla_tlod_1_entire: yes, no;

ASK ver_sec_code: "Verify item has a security code!
Is it a controlled item?
";
CHOICES ver_sec_code: yes, no;

ASK ver_request_type: "Did this package originate from a memo
request or did it come from pre-adjustment research?
";
CHOICES ver_request_type: memo, pre_adjustment;

ASK adj: "Did the pre_adjustment section
solve the entire problem?
";
CHOICES adj: yes, no;

ASK float_res_disc: "Does the float you discovered
resolve the discrepancy?
";
CHOICES float_res_disc: yes, no;
```

```
ASK kardex_count_tlod: "Compare the physical count and the
custodian's Kardex against the TLOD. Are they equal?
";
CHOICES kardex_count_tlod: yes, no;

ASK addl_aves_info: "Do you know what additional avenues
can be investigated to assist in resolving the discrepancy?
";
CHOICES addl_aves_info: yes, no;

ASK addl_aves_info_cont: "Enter 'continue' when you are
ready to see the rest of the list.
";
CHOICES addl_aves_info_cont: continue;

ASK float_cardex_count_tlod: "Compare the information discovered

in the float to the difference between the Kardex/count and the
TLOD. Are they equal?
";
CHOICES float_cardex_count_tlod: equal, not_equal;

ASK addl_aves: "Do any of these additional avenues help
resolve the discrepancy?
";
CHOICES addl_aves: yes, no;

ASK addl_aves_total_adj: "Did the additional information
discovered correct the entire discrepancy?
";
CHOICES addl_aves_total_adj: yes, no;

ASK count_kardex: "Is there a discrepancy between
the physical count and the Kardex?
";
CHOICES count_kardex: yes, no;

ASK tlod_cardx_count: "Compare the TLOD against the Kardex
and the physical count. Does it help resolve the difference?
";
CHOICES tlod_cardx_count: yes, no;
```

```
ASK tlod_cardx: "Is the TLOD balance greater than or less
than the Kardex and physical count balance?
";
CHOICES tlod_cardx: greater, less_than;

ASK count_tlod: "Did the physical count reveal some of
the discrepancy with the TLOD?
";
CHOICES count_tlod: yes, no;

ASK count_tlod_diff: "Does the remaining discrepancy leave the

count greater than, equal to, or less than the TLOD?
";
CHOICES count_tlod_diff: greater_than, equal_to, less_than;

ASK d9a: "Is the D9A valid?  Reasons for nonvalidity
are frustrated material, duplicate postings, erroneous postings

(ie. wrong quantity) and posting receipt to wrong line item.
";
CHOICES d9a: valid, not_valid;

ASK msir_correct: "Is the MSIR correct?  Does the on
hand balance equal the MSIR balance?
";
CHOICES msir_correct: yes, no;

ASK receipt_matl_missid: "Has the received
material been misidentified?
";
CHOICES receipt_matl_missid: yes, no;

ASK receipt: "Is the total of the receipt discovered in
the float greater than, equal to, or less than the D9A?
";
CHOICES receipt: greater_than, equal_to, less_than;

ASK receipt_tlod: "Is the receipt discovered in the TLOD
greater than, equal to, or less than the D9A?
";
CHOICES receipt_tlod: greater_than, equal_to, less_than;
```

```
ASK recovered_receipt: "What percentage of the 'lost material'
receipt was discovered in the TLOD research?
";
CHOICES recovered_receipt: integer;

ASK cant_find_answer: "
                The system does not yet have a rule that
                matches all of your inputs. Please select the
                Menu choice provided to return to the Main
                Menu.
";
CHOICES cant_find_answer: Return_to_Main_Program;
```

```
!/############################################################/

!                    DUES MANAGEMENT EXPERT SYSTEM

!    The next rule base is the DUES MANAGEMENT expert system, by
!    Captain Potwin, USMC.


!EXECUTE;
!RUNTIME;
ENDOFF;
ACTIONS
WOPEN 1,1,1,14,77,7
ACTIVE 1
     DISPLAY "
                      D U E S    M A N A G E M E N T

                   E X P E R T    S Y S T E M    F O R

               I N V E N T O R Y    M A N A G E R S    A T

                 R ` T A I L    S T O C K    P O I N T S



                        Press ANY key to continue.~"
WCLOSE 1
     FIND conclusion
WOPEN 1,1,1,5,77,7
ACTIVE 1
DISPLAY"
                  Press ANY key to return to the Main Menu.

~"
    CHAIN intmod;
```

```
RULE 1
IF    module = Delinquent_Dues AND
      status = none AND
      pri_sat = No_should_be_upgraded
THEN conclusion = conclusion_1
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Send an AMA document
modifier to raise
the priority.
                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "When no status has been received and the priority is
determined to be not satisfactory, an AMA document modifier is
used to upgrade the priority and to establish a requisition if
ICP has no record of it.
";


RULE 2
IF    module = Delinquent_Dues AND
      status = none AND
      pri_sat = yes
THEN conclusion = conclusion_2
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Send an ATA follow up.

                                      Press ANY key to continue~."
WCLOSE 1
BECAUSE "When no status has been received and the priority is
determined to be satisfactory, an ATA follow up should be sent on
the requisition. An ATA is processed as requisition if original
requisition is not received.
";
```

```
RULE 3
IF   module = Delinquent_Dues AND
     status = ba AND
     status_age = less
THEN conclusion = conclusion_3
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "When BA status has been received, but the status age is

less than 30 days old, no action is yet necessary.  It is too
early to take additional action. 9A status denotes item is being

processed for release and shipment.
";


RULE 4
IF   module = Delinquent_Dues AND
     status = ba AND
     status_age = more AND
     follow_up = no OR
     follow_up = unknown
THEN conclusion = conclusion_4
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Send an AF1 follow up.

                            Press ANY key to continue~."
WCLOSE 1
BECAUSE "When BA status has been received, and the status age is

more than 30 day old and no follow up has been sent (or if it is

not known if a follow up has been sent) then you should send an
AF1 follow up to request updated status.
";
```

```
RULE 5
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      rev_edd = yes
THEN conclusion = conclusion_5
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Update the Revised EDD.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "When 9A status has been received and the status age is
more than 30 days old and a revised EDD is received in response
to a follow up, then update the Revised EDD because the document

is no longer delinquent.
";
```

```
RULE 6
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      rev_edd = no AND
      classified = yes AND
      category = 3 OR
      category = 4 OR
      category = 5 OR
      category = 6
THEN conclusion = conclusion_6
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Cancel, request spot
inventory, and
submit ROD.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If BA status is over 30 days old with no
revised/extended EDD received, the material is classified,
pilferable or controlled and the category of the due is 3 or
higher, then you should cancel the due, request a spot inventory

and submit a ROD.
";
```

```
RULE 7
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      rev_edd = no AND
      classified = yes AND
      category = 1 OR
      category = 2
THEN conclusion = conclusion_7
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Send an AF1 follow up.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If 9A status is over 30 days old with no
revised/extended EDD received, the material is classified,
pilferable or controlled and the category of the due is less
than 3, then you should send an AF1 follow up to request updated

status on the requisition.
";
```

```
RULE 8
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      follow_up = yes AND
      classified = yes AND
      value = no AND
      category = 3 OR
      category = 4 OR
      category = 5 OR
      category = 6
THEN conclusion = conclusion_8
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Cancel, request spot
inventory, and
submit ROD.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If BA status is over 30 days old and a follow up has
been sent, the material is classified, pilferable or controlled,

the value of the material is less than $100.00 and the category
of the due is 3 or higher, then you should cancel, request a spot
inventory, and submit a ROD.
";
```

```
RULE 9
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      follow_up = yes AND
      classified = yes AND
      value = no AND
      category = 1 OR
      category = 2
THEN conclusion = conclusion_9
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Send an AF1 follow up.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If BA status is over 30 days old, a follow up has been
sent, and the material is classified, pilferable or controlled,
the value of the material is less than $100.00 and the category
of the due is less than 3, then you should send an AF1 follow up

to request updated status.
";



RULE 10
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      rev_edd = no AND
      classified = no AND
      category = 1
THEN conclusion = conclusion_10
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If BA status is over 30 days old, no revised or extended
EDD has been received, the material is not classified,
pilferable or controlled and the category of the due is I,
then no action is required at this time.
";
```

```
RULE 11
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      rev_edd = no AND
      classified = no AND
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_11
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Send an AF1 follow up.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If BA status is more than 30 days old, no revised or
extended EDD has been received, the material is not classified,
pilferable or controlled, and the category of the due is 2, 3 or

4, then you should send an AF1 follow up to request updated
status.
";
```

```
RULE 12
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      rev_edd = no AND
      classified = no AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_12
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel and submit an AC1.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If BA status is more than 30 days old, no revised or
extended EDD has been received, the material is not classified,
pilferable or controlled and the category of the due is 5 or 6
then you should cancel and submit an AC1.
";
```

```
RULE 13
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      rev_edd = no AND
      follow_up = yes AND
      classified = no AND
      value = no AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_13
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Store to zero.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If BA status is more than 30 days old and no revised or

extended EDD has been received, a follow up has been sent, the
material is not classified, pilferable or controlled and the
value is less than $100.00 and the category of the due is 5 or 6,
then you should store to zero.
";
```

```
RULE 14
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      rev_edd = no AND
      follow_up = yes AND
      classified = no AND
      value = no AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_14
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Send an AF1 follow up.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If BA status is more than 30 days old, no revised or
extended EDD has been received, a follow has been sent, the
material is not classified, pilferable or controlled, the value
is less than $100.00 and the category of the due is less than 5,

then you should Send an AF1 follow up to request updated status.

";
```

```
RULE 15
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      rev_edd = no AND
      follow_up = yes AND
      value = yes AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_15
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Send an AF1 follow up.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If BA status is more than 30 days old, no revised or
extended EDD has been received, a follow up has been sent, the
value of the material is greater than $100.00 and the category of
the due is less than 5, then you should send an AF1 follow up to

request updated status.
";
```

```
RULE 16
IF    module = Delinquent_Dues AND
      status = ba AND
      status_age = more AND
      rev_edd = no AND
      follow_up = yes AND
      value = yes AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_16
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel and submit ROD.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If BA status is more than 30 days old, a revised EDD has
not been received, a follow up has been sent, the value of the
material is greater than $100.00, and the category of the due is

5 or 6 then you should cancel the due and submit a ROD.
";



RULE 17
IF    module = Delinquent_Dues AND
      status = other AND
      rev_edd = no AND
      z67 = no AND
      dla = no
THEN conclusion = conclusion_17
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel.

                                Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, no
revised/extended EDD has been received, there is no Z67 record
and no record in DLA files, the material may have been received
and paid for already or the requisition was canceled by the ICP.

You should cancel the due.
";
```

```
RULE 18
IF    module = Delinquent_Dues AND
      status = other AND
      accounts_payable = yes
THEN conclusion = conclusion_18
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel the due, but do not
cancel the
obligation.

                                  Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status of the requisition is other than BA or AS

and funds are in accounts payable it is possible the material has
been received, but has not been billed for yet. Therefore you
should cancel the due, but not the obligation.
";

RULE 19
IF    module = Delinquent_Dues AND
      status = other AND
      mit = yes AND
      value = yes AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_19
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel and submit ROD.

                                  Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status of the requisition is other than BA or AS

and funds are in MIT, the value of the material is greater than
$100.00 and the category of the due is 5 or 6 then you should
cancel the due and submit a ROD.
";
```

```
RULE 20
IF    module = Delinquent_Dues AND
      status = other AND
      mit = yes AND
      value = yes AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_20
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Send an AF1 follow up.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, the funds are in
MIT, the value of the material is over $100.00 and the category
of the due is less than 5, then you should send an AF1 follow up

 requesting updated status.
";
```

```
RULE 21
IF    module = Delinquent_Dues AND
      status = other AND
      mit = yes AND
      value = no AND
      classified = no AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_21
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Send and AF1 follow up.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, the funds are in
MIT, the value of the material is less than $100.00, the material
is not classified, pilferable or controlled and the category of
the due is less than 5, then you should send an AF1 follow up to

request updated status.
";
```

```
RULE 22
IF    module = Delinquent_Dues AND
      status = other AND
      mit = yes AND
      value = no AND
      classified = no OR
      category = 5 OR
      category = 6
THEN conclusion = conclusion_22
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Store to zero.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, the funds are in
MIT, the value of the material is less than $100.00, the material
is not classified, pilferable or controlled, the the category of

the due is 5 or 6, then you should store to zero.
";
```

```
RULE 23
IF    module = Delinquent_Dues AND
      status = other AND
      mit = yes AND
      value = no AND
      classified = yes AND
      category = 3 OR
      category = 4 OR
      category = 5 OR
      category = 6
THEN conclusion = conclusion_23
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Cancel, request spot
inventory, and
submit ROD.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, the funds are in
MIT, the value of the material is less than $100.00, the material
is classified, pilferable or controlled, and the category of the

due is 3 or greater, then you should cancel the due, request a
spot inventory, and submit a ROD.
";
```

```
RULE 24
IF   module = Delinquent_Dues AND
     status = other AND
     mit = yes AND
     value = no AND
     classified = yes AND
     category = 1 OR
     category = 2
THEN conclusion = conclusion_24
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Send an AF1 follow up.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, the funds are
in MIT, the value of the material is less than $100.00, the
material is classified, pilferable or controlled and the
category off the due is 1 or 2, then you should send an AF1
follow up requesting updated status.
";



RULE 25
IF   module = Delinquent_Dues AND
     status = other AND
     obligations = yes AND
     needed = no AND
     canc_subm = no
THEN conclusion = conclusion_25
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Submit an AC1 cancellation
request.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, the funds are in
obligations, the material is no longer needed and an AC1
cancellation request has not been sent, then you should submit
an AC1 cancellation.
";
```

```
RULE 26
IF    module = Delinquent_Dues AND
      status = other AND
      obligations = yes AND
      needed = no AND
      canc_subm = yes AND
      canc_ackn = no
THEN conclusion = conclusion_26
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:    Submit another AC1
cancellation request.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, the funds are in
obligations, the material is no longer needed, an AC1
cancellation request has been submitted but not acknowledged,
then you should submit another AC1 cancellation request.
";



RULE 27
IF    module = Delinquent_Dues AND
      status = other AND
      obligations = yes AND
      needed = no AND
      canc_subm = yes AND
      canc_ackn = yes
THEN conclusion = conclusion_27
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is necessary at
this time.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If a cancellation has been submitted and acknowledged,
the requisition should drop off the delinquent dues listing soon,
no action is required.
";
```

```
RULE 28
IF   module = Delinquent_Dues AND
     status = other AND
     obligations = yes AND
     needed = yes
THEN conclusion = conclusion_28
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Send an AF1 follow up, or
send message
requesting shipping status.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, the funds are in
obligations and the material is still needed, then send an AF1
follow up requesting updated status or send a message requesting

shipping status.
";



RULE 29
IF   module = Delinquent_Dues AND
     status = other AND
     obligations = yes AND
     needed = yes AND
     pri_sat = yes AND
     category = 5 OR
     category = 6
THEN conclusion = conclusion_29
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel and submit an AC1.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, the funds are in
obligations, the material is still needed, the priority is
determined to be satisfactory and the category of the due
is 5 or 6, then you should cancel the due and submit an AC1
system cancellation request.
";
```

```
RULE 30
IF    module = Delinquent_Dues AND
      status = other AND
      z67 = no AND
      dla = yes AND
      needed = yes
THEN conclusion = conclusion_30
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Further research is
required.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, there is no z67
record, the requisition is in DLA files, the material is still
needed, then further research is required. Possibly paid for
but not received, should conduct financial audit to find what
was paid for.
";



RULE 31
IF    module = Delinquent_Dues AND
      status = other AND
      z67 = no AND
      dla = yes AND
      needed = yes AND
      sub = yes
THEN conclusion = conclusion_31
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS status, there is
no z67 record, the requisition is in DLA files, the material is
still needed but a substitute was received, then you should cancel

the due.  The material has been received under a substitute NSN.

";
```

```
RULE 32
IF    module = Delinquent_Dues AND
      status = other AND
      z67 = no AND
      dla = no AND
      needed = yes AND
      sub = no
THEN conclusion = conclusion_32
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel, and reorder.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, there is not a z67
record, the requisition is not in DLA files, the material is still

needed and a substitute was not received, then you should cancel

the due and reorder.
";



RULE 33
IF    module = Delinquent_Dues AND
      status = other AND
      z67 = no AND
      dla = yes AND
      needed = no
THEN conclusion = conclusion_33
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel and submit an AC1.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is other than BA or AS, there is not a z67
record, the requisition is in DLA files, and the material is not

needed then cancel the due and submit an AC1 system cancellation

request.
";
```

```
!     This section of the rule base deals with AS status.  AS
!     status means the material has been shipped.


RULE 34
IF    module = Delinquent_Dues AND
      status = as AND
      category = 1 OR
      category = 2 OR
      category = 3
THEN conclusion = conclusion_34
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS and the category of the due is less

than 4, then no action is required.  The goods are in the mail.
";
```

```
RULE 35
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = yes AND
      value = yes AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_35
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel and submit ROD for
MIT quantity.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, the funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, a partial shipment was
received, the value of the material is more than $100.00, and the
category of the due is 5 or 6 then you should cancel the due and

submit a ROD for the MIT quantity.
";
```

```
RULE 36
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = yes AND
      value = no AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_36
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Store to zero the MIT
quantity.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, the funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, a partial shipment was
received, the value of the material is less than $100.00 and the

category of the due is 5 or 6, then you should store to the zero

the quantity in MIT.
";
```

```
RULE 37
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = yes AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_37
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action required.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, the funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, a partial shipment was
received and the category of the due is less than 5, then no
action
is required yet.
";
```

```
RULE 38
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = yes AND
      sub = no AND
      value = no AND
      classified = yes AND
      category = 3 OR
      category = 4 OR
      category = 5 OR
      category = 6
THEN conclusion = conclusion_38
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Cancel, request spot
inventory and
submit ROD for the MIT quantity.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, a partial shipment was
received, no substitutes were received, the value of the material
is less than $100.00, the material is classified, pilferable or
controlled and the category of the due is 3 or greater, then you

should cancel the due, request a spot inventory and submit a ROD

for the mit quantity.
";
```

```
RULE 39
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = yes AND
      sub = no AND
      value = no AND
      classified = yes AND
      category = 1 OR
      category = 2
THEN conclusion = conclusion_39
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, the funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, a partial shipment was
received, no substitute was received, the material is classified,
pilferable or controlled and the category of the due is less than
3,
then no action is required yet.
";
```

```
RULE 40
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = yes AND
      sub = no AND
      value = no AND
      classified = no AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_40
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Store to zero.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, the funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, a partial shipment was
received, no substitute was received, the value of the material
is
less than $100.00 , the material is not classified, pilferable or
controlled and the category of the due is 5 or 6, then you should
store to zero.
";
```

```
RULE 41
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = yes AND
      sub = no AND
      value = no AND
      classified = no AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_41
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action required.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, the funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, a partial shipment was
received, no substitute was received, the value of the material
is
less than $100.00, the material is not classified, pilferable or

controlled and the category of the due is less than 5, then no
action
is required yet.
";
```

```
RULE 42
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = yes AND
      sub = no AND
      value =  yes AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_42
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel and submit ROD.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, the funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, a partial shipment has
been received, no substitute has been received, the value of the

material is less than $100.00 and the category of the due is 5 or
6,
then you should cancel the due and submit a ROD.
";
```

```
RULE 43
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = yes AND
      sub = no AND
      value = yes AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_43
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action required.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, a partial shipment has
been received, no substitute has been received, the value of the

material is over $100.00 and the category of the due is less than
5,
then no action is required yet.
";
```

```
RULE 44
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = no AND
      sub = yes
THEN conclusion = conclusion_44
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, no partial shipment
was
received, but a substitute was received, then you should cancel
the due.
";
```

```
RULE 45
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      part_ship = no AND
      sub = no AND
      value = no AND
      classified = no AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_45
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Store to zero.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in MIT, no partial
shipment
was received, no substitute was received, the material is not
classified, pilferable or controlled, and the category of the due
is 5 or 6, then you should store to zero.
";
```

```
RULE 46
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      part_ship = no AND
      sub = no AND
      value = no AND
      classified = no AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_46
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in MIT, no partial
shipment
was received, no substitute was received, the value of the
material
is less than $100.00, the material is not classified, pilferable
or
controlled and the category of the due is less than 5, then no
action
is required yet.
";
```

```
RULE 47
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = no AND
      sub = no AND
      value = yes AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_47
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel and submit ROD.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, no partial shipment
was received, no substitute was received, the value of the
material
is over $100.00 and the category of the due is 5 or 6, then you
should cancel the due and submit a ROD.
";
```

```
RULE 48
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = no AND
      part_ship = no AND
      sub = no AND
      value = yes AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_48
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action required.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, the funds are in MIT, the disbursed
quantity is not equal to the MIT quantity, no partial shipment
was
received, no substitute was received, the value of the material
is
over $100.00 and the category of the due is less than 5, then no

action is required yet.
";
```

```
RULE 49
IF      module = Delinquent_Dues AND
        status = as AND
        mit = yes AND
        disb_qty = yes AND
        value = no AND
        classified = no AND
        category = 5 OR
        category = 6
THEN conclusion = conclusion_49
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Store to zero.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, the funds are in MIT, the disbursed
quantity is equal to the MIT quantity, the value of the material
is
less than $100.00, the material is not classified, pilferable or

controlled and the category of the due is 5 or 6, then you should
store to zero.
";
```

```
RULE 50
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = yes AND
      value = no AND
      classified = no AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_50
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action required.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, the funds are in MIT, the disbursed
quantity is equal to the MIT quantity, the value of the material
is
less than $100.00, the material is not classified, pilferable or

controlled and the category of the due is less than 5, then no
action
is required yet.
",
```

```
RULE 51
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = yes AND
      value = no AND
      classified = yes AND
      category = 3 OR
      category = 4 OR
      category = 5 OR
      category = 6
THEN conclusion = conclusion_51
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:   Cancel, request spot
inventory and
submit ROD.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in MIT, the disbursed
quantity is equal to the MIT quantity, the value of the material
is
less than $100.00, the material is classified pilferable or
controlled
and the category of the due is 3 or greater, then you should
cancel,
request a spot inventory and submit a ROD.
";
```

```
RULE 52
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = yes AND
      value = no AND
      classified = yes AND
      category = 1 OR
      category = 2
THEN conclusion = conclusion_52
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action required.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in MIT, the disbursed
quantity is equal to the MIT quantity, the value of the material
is
less than $100.00, the material is classified, pilferable or
controlled
and the category of the due is less than 3, then no action is
required
yet.
";
```

```
RULE 53
IF    module = Delinquent_Dues AND
      status = as AND
      mit = yes AND
      disb_qty = yes AND
      value = yes AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_53
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel and submit ROD.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in MIT, the disbursed
quantity is equal to the MIT quantity, the value of the material
is
greater than $100.00 and the category of the due is 5 or 6, then
you
should cancel the due and submit a ROD.
";
```

```
RULE 54
IF      module = Delinquent_Dues AND
        status = as AND
        mit = yes AND
        disb_qty = yes AND
        value = yes AND
        category = 1 OR
        category = 2 OR
        category = 3 OR
        category = 4
THEN conclusion = conclusion_54
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in MIT, the disbursed
quantity is equal to the MIT quantity, the value of the material

is greater than $100.00 and the category of the due is less than
5,
then no action is required yet.
";
```

```
RULE 55
IF    module = Delinquent_Dues AND
      status = as AND
      accounts_payable = yes AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_55
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel due, but do not
cancel
obligation.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in accounts payable and
the category of the due is 5 or 6, then you should cancel the due,

but do not cancel the obligation.
";



RULE 56
IF    module = Delinquent_Dues AND
      status = as AND
      accounts_payable = yes AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_56
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in accounts payable and
the category of the due is less than 5, then no action is required
yet.
";
```

```
RULE 57
IF   module = Delinquent_Dues AND
     status = as AND
     obligations = yes AND
     category = 5 OR
     category = 6
THEN conclusion = conclusion_57
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel due, but do not
cancel
obligation.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in obligations and the
category
of the due is 5 or 6, then you should cancel the due but do not
cancel
the obligation.
";



RULE 58
IF   module = Delinquent_Dues AND
     status = as AND
     obligations = yes AND
     category = 1 OR
     category = 2 OR
     category = 3 OR
     category = 4
THEN conclusion = conclusion_58
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, funds are in obligations and the
category of the due is less than 5, then no action is required
yet.
";
```

```
RULE 59
IF    module = Delinquent_Dues AND
      status = as AND
      z67 = no AND
      fund_code_26 = yes AND
      nine_cog = yes AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_59
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel and re-establish
under J3 fund
code (stock-fund).

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, there is no z67 record, the
requisition
is a fund code 26 item and 9 cog and the category of the due is
5 or 6,
then you should cancel and re_establish under J3 fund code (stock
fund).
";
```

```
RULE 60
IF    module = Delinquent_Dues AND
      status = as AND
      z67 = no AND
      fund_code_26 = yes AND
      nine_cog = yes AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_60
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, there is no z67 record, the item is
fund code 26 and 9 cog, and the category of the due is less than
5,
then no action is required yet.
";
```

```
RULE 61
IF    module = Delinquent_Dues AND
      status = as AND
      z67 = no AND
      fund_code_26 = yes AND
      nine_cog = no AND
      category = 5 OR
      category = 6
THEN conclusion = conclusion_61
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Store to zero.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, there is no Z67 record, the item is
a
fund code 26 item and 9 cog, and the category of the due is 5 or
6,
then you should store to zero.
";
```

```
RULE 62
IF    module = Delinquent_Dues AND
      status = as AND
      z67 = no AND
      fund_code_26 = yes AND
      nine_cog = no AND
      category = 1 OR
      category = 2 OR
      category = 3 OR
      category = 4
THEN conclusion = conclusion_62
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, the item is fund code 26, but not
9
cog and the category of the due is less than 5, then no action is
required at this time.
";



RULE 63
IF    module = Delinquent_Dues AND
      status = as AND
      z67 = no AND
      fund_code_26 = no
THEN conclusion = conclusion_63
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the status is AS, there is no Z67 record, and the item

is not fund code 26, then cancel the due.
";



!     The following section or the rule base deals with System
```

```
!  Cancellations status.  This includes CG, CJ, CA, CS, CK and
!  and CE status.


!     This section deals with CG status reguisitions:



RULE 64
IF    module = System_Cancellations AND
      c_status = cg AND
      doc_num = no AND
      nsn_val = no AND
      req_dem = yes
THEN     conclusion = conclusion_64
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Submit new requisition on
original NSN.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the document number does not match the original NSN
ordered and the NSN on the CG status card is not valid, then you

should reorder the original NSN.
";
```

```
RULE 65
IF   module = System_Cancellations AND
     c_status = cg AND
     doc_num = yes AND
     nsn_val = no
THEN conclusion = conclusion_65
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Delete invalid NSN from
local
files (MISR).

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If original NSN ordered is the same as NSN on CC status

card, an invalid NSN has been established on local files (MISR).

";



RULE 66
IF   module = System_Cancellations AND
     c_status = cg AND
     doc_num = yes AND
     nsn_val = yes AND
     req_dem = yes
THEN conclusion = conclusion_66
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Submit new requisition on
original NSN.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If document number matches original NSN ordered and NSN

on CC status card is valid, reorder original NSN if item is still
required.
";
```

```
RULE 67
IF   module = System_Cancellations AND
     c_status = cg AND
     doc_num = yes AND
     nsn_val = yes AND
     req_dem = no
THEN conclusion = conclusion_67
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action required.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If item is no longer required based on demand, then no
action is required.  Do not reorder.
";




!   This section deals with CJ status on requisitions



RULE 68
IF   module = System_Cancellations AND
     c_status = cj AND
     doc_num = no AND
     nsn_val = yes AND
     val_sub = yes
THEN conclusion = conclusion_68
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Input change notice tc tie
NSNs.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If NSN on CJ status card is a valid substitute, input
change notice to establish the NSNs as valid substitutes in
the MISR file.
";
```

```
RULE 69
IF    module = System_Cancellations AND
      c_status = cj AND
      doc_num = no AND
      nsn_val = yes AND
      val_sub = yes AND
      tech_sub = yes
THEN conclusion = conclusion_69
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Input change notice to tie
NSNs.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If NSN on CJ status card is a valid substitute, input
change notice to establish the NSNs as valid substitutes in
the MISR file.
";



RULE 70
IF    module = System_Cancellations AND
      c_status = cj AND
      doc_num = no AND
      nsn_val = yes AND
      val_sub = no AND
      tech_val = no AND
      req_dem = yes
THEN conclusion = conclusion_70
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Submit new requisition
citing 2b advice
code.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If the substitute NSN provided on the CJ status card is

determined to be invalid, reorder with 2b advice code.
";
```

```
RULE 71
IF    module = System_Cancellations AND
      c_status = cj AND
      sub_prov = no AND
      req_dem = yes
THEN conclusion = conclusion_71
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY  "The system's conclusion is:  Send Speedletter to FMSO
requesting
substitute NSN or alternate source of supply.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "Substitute NSN is not provided and the item is still
required based on demand, a Speedletter should be sent to FMSO
requesting a substitute NSN or alternate source of supply.
";



RULE 72
IF    module = System_Cancellations AND
      c_status = cj AND
      sub_prov = no AND
      req_dem = no
THEN conclusion = conclusion_72
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Delete NSN from local files
(MISR).

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If item is no longer required based demand, then delete

obsolete NSN from local files (MISR).
";
```

```
RULE 73
IF    module = System_Cancellations AND
      c_status = cj AND
      doc_num = no AND
      nsn_val = yes AND
      val_sub = no AND
      tech_val = no AND
      req_dem = yes AND
      pre_ad = yes
THEN conclusion = conclusion_73
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Contact ICP and request
verification of
invalid substitute NSN.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If CJ status comes back with an invalid substitute NSN
after a requisition was submitted with a 2b advice code you should

contact the ICP and request verification of the substitute NSN.
";



RULE 74
IF    module = System_Cancellations AND
      c_status = ca
THEN conclusion = conclusion_74
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Delete NSN from local files
(MISR) or
if after review, item is still determined to be a valid
requirement, send
speedletter requesting substitute or replacement item.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "CA status normally comes with narrative message stating

reason for rejection.
";
```

```
! This section deals with CA status


RULE 75
IF   module = System_Cancellations AND
     c_status = cs AND
     qty_excess = no
THEN conclusion = conclusion_75
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Submit new requisition with
2L advice
code.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If you determine guantity to not be excessive based on
your demand, submit a new requisition with a 2L advice code.
";



RULE 76
IF   module = System_Cancellations AND
     c_status = cs AND
     qty_excess = yes
THEN conclusion = conclusion_76
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action required.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "Possibly ordered incorrect excessive quantity.  No action

is required.
";



! This section deals with CK status
```

```
RULE 77
IF    module = System_Cancellations AND
      c_status = ck
THEN conclusion = conclusion_77
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Delete NSN from local files
(MISR).

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "Normally not pursued further at the NSC level, may be
uneconomical to procure.
";



!  This section deals with CE status


RULE 78
IF    module = System_Cancellations AND
      c_status = ce AND
      current_ui = yes
THEN conclusion = conclusion_78
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Submit new requisition with
MISR unit
of issue.

                                    Press ANY key to continue~."
WCLOSE 1
BECAUSE "If status is CE and verification of the current unit of

issue in the MISR showed it to be correct, then you should submit
a
new requisition with MISR unit of issue.
";
```

```
RULE 79
IF   module = System_Cancellations AND
     c_status = ce AND
     current_ui = no
THEN conclusion = conclusion_79
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Input change notice to
correct the unit
of issue.

                                        Press ANY key to continue~."
WCLOSE 1
BECAUSE "If current unit of issue is incorrect on MISR, input
change
notice to correct.  This will generate correct unit of issue on
next
reorder.
";

RULE 80
IF   module = Delinquent_Dues OR
     module = System_Cancellations
THEN conclusion = conclusion_80
WOPEN 1,1,1,12,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:

   !!!!   SORRY   !!!!   SORRY   !!!!   SORRY   !!!!   SORRY
!!!!

        THERE IS NO RULE IN THE RULE BASE WHICH MATCHES ALL OF
        THE ANSWERS YOU PROVIDED TO THE SYSTEM. SORRY FOR THE
        INCONVENIENCE. PLEASE SEE YOU SUPERVISOR FOR FURTHER
        ASSISTANCE.


                                        Press ANY key to continue.~"
WCLOSE 1;

!   The following section of the Expert System is the listing of
!   the questions which solicit information reguired by the RULE
!   base.
```

```
ASK module: "Which Module of Dues Management do you want to
work with?";
CHOICES module: Delinquent_Dues, System_Cancellations;

ASK status: "What is the supply status?";
CHOICES status: none,ba,as,other;

ASK status_age:
"Is the age of the most recent supply status more than 30 days or
less?";
CHOICES status_age: more, less;

ASK prisat: "Is the priority satisfactory?";
CHOICES pri_sat: yes, No_should_be_upgraded;

ASK follow_up: "Has a follow up been previously submitted?";
CHOICES follow_up: yes,no;

ASK rev_edd: "Has a revised/extended EDD been received?";
CHOICES rev_edd: yes,no;

ASK classified:
"Is the material classified,pilferable, or controlled?";
CHOICES classified: yes,no;

ASK value: "Is the dollar value of the material more than
$100.00?";
CHOICES value: yes,no;

ASK z67: "Is there a z67 record?";
CHOICES z67: yes,no;

ASK mit: "Are funds in MIT?";
CHOICES mit: yes,no;

ASK accounts_payable: "Are funds in accounts payable?";
CHOICES accounts_payable: yes, no;

ASK obligations: "Are funds in obligations?";
CHOICES obligations: yes,no;

ASK dla: "Is the requisition for the material in DLA files?";
CHOICES dla: yes,no;
```

```
ASK category: "What is the category of the delinquent due?";
CHOICES category: 1,2,3,4,5,6;

ASK needed: "Is the material still needed?";
CHOICES needed: yes,no;

ASK canc_subm: "Has a cancellation request been submitted? (AC1)";

CHOICES canc_subm: yes, no;

ASK canc_ackn:
"Has the submitted cancellation request been acknowledged?";
CHOICES canc_ackn: yes,no;

ASK disb_qty: "Is the disbursed quantity equal to the MIT
quantity?";
CHOICES disb_qty: yes,no;

ASK part_ship: "Is there a partial shipment?";
CHOICES part_ship: yes, no;

ASK sub: "Has a substitute been received?";
CHOICES sub: yes,no;

ASK fund_code_26: "Is the document a fund code 26 item?";
CHOICES fund_code_26: yes,no;

ASK nine_cog: "Is the item a 9 cog item?";
CHOICES nine_cog: yes, no;

ASK c_status: "What is the system cancellation status?";
CHOICES c_status: cs,ca,ck,cj,cg;

ASK doc_num: "Does the document number match the NSN ordered?";
CHOICES doc_num: yes,no;

ASK nsn_val: "Is the NSN valid on the status card?";
CHOICES nsn_val: yes,no;

ASK req_dem: "Is the item still required based on demand?";
CHOICES req_dem: yes,no;

ASK val_sub: "Is the item a valid substitute in the M";
CHOICES val_sub: yes,no;
```

```
ASK tech_val:
"Did the technical dept (of NSC, San Diego) determine the item to
be a
valid substitute?";
CHOICES tech_val: yes,no;

ASK sub_prov: "Was a substitute NSN provided on the CJ status
card?";
CHOICES sub_prov: yes,no;

ASK pre_ad: "Was item previously ordered with a 2b advice code?";
CHOICES pre_ad: yes,no;

ASK qty_excess: "Is the quantity ordered excessive based on
demand?";
CHOICES qty_excess: yes,no;

ASK current_ui: "Is the current unit of issue on MISR valid?";
CHOICES current_ui: yes,no;
```

```
!/############################################################/

!                    VARIABLE RANKING LISTINGS

!    The following rule base is the Variable Ranking Listings
!    rule base written by LT William Schill in PROLOG and
!    converted in March 1990 to VP-EXPERT.


ENDOFF;
ACTIONS
WOPEN 1,1,1,8,77,3
ACTIVE 1
DISPLAY "
               N A V Y   S T O C K   P O I N T   S Y S T E M

                    V A R I A B L E   R A N K I N G



                                                  Press Any Key~"
WCLOSE 1
        FIND conclusion
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
               Press ANY key to return to the Main Menu.

~"

           CHAIN intmod;


!/* 1-RULE 1 */
RULE 1
IF      variable_ranking_group = Group_One AND
        extended_money_value = No
THEN conclusion = no_action
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                    Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 1-RULE 2 */
RULE 2
IF      variable_ranking_group = Group_One AND
        extended_money_value = Yes AND
        average_quarterly = No AND
                d u e s _ s u p p l y _ s t a t u s    =
DUE_status_is_BB_or_BD_with_future_EDD
THEN conclusion = no_action
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";



!/* 1-RULE 3 */
RULE 3
IF      variable_ranking_group = Group_One AND
        extended_money_value = Yes AND
        average_quarterly = Yes AND
        current_status_values = Yes AND
        substitute1 = No AND
        multiple_dues_values = Yes AND
        dues_supply_status = 1_or_more_DUES_is_not_BA_BV_or_AS
THEN conclusion = canc_dues
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  Cancel any or all dues with other
than BA,
BV, or AS status, starting with those having the most distant
EDDs,
until the excess is eliminated, or there are no more dues.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 1-RULE 4 */
RULE 4
IF      variable_ranking_group = Group_One AND
        extended_money_value = Yes AND
        average_quarterly = Yes AND
        current_status_values = Yes AND
        substitute1 = No AND
        multiple_dues_values = Yes AND
        dues_supply_status = All_DUES_have_status_of_BA_BV_or_AS
THEN    conclusion = no_canc
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  None of the dues can be cancelled.
No action
is recommended.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";



!/* 1-RULE 5 */
RULE 5
IF      variable_ranking_group = Group_One AND
        extended_money_value = Yes AND
        average_quarterly = Yes AND
        current_status_values = Yes AND
        substitute1 = No AND
        multiple_dues_values = No AND
        dues_supply_status = The_status_is_other_than_BA_BV_or_AS
THEN conclusion = canc_excess
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  The excess qty should be
cancelled.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 1-RULE 6 */
RULE 6
IF      variable_ranking_group = Group_One AND
        extended_money_value = Yes AND
        average_quarterly = Yes AND
        current_status_values = Yes AND
        substitutel = No AND
        multiple_dues_values = No AND
        dues_supply_status = The_status_on_the_due_is_BA_BV_or_AS
THEN conclusion = no_canc
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  None of the dues can be cancelled.
No action
is recommended.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 1-RULE 7 */
RULE 7
IF      variable_ranking_group = Group_One AND
        extended_money_value = Yes AND
        average_quarterly = Yes AND
        current_status_values = Yes AND
        substitute1 = Yes AND
        combined_demand_for_orig_&_subs_NSNs = No AND
        multiple_dues_values = Yes AND
        dues_supply_status = 1_or_more_DUES_is_not_BA_BV_or_AS
THEN conclusion = canc_dues
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  Cancel any or all dues with other
than BA,
BV, or AS status, starting with those having the most distant
EDDs,
until the excess is eliminated, or there are no more dues.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 1-RULE 9 */
RULE  8
IF       variable_ranking_group = Group_One AND
         extended_money_value = Yes AND
         average_quarterly = Yes AND
         current_status_values = Yes AND
         substitute1 = Yes AND
         combined_demand_for_orig_&_subs_NSNs = No AND
         multiple_dues_values = Yes AND
         dues_supply_status = All_DUES_have_status_of_BA_BV_or_AS
THEN     conclusion = no_canc
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  None of the dues can be cancelled.
No action
is recommended.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";



!/* 1-RULE 8 */
RULE  9
IF       variable_ranking_group = Group_One AND
         extended_money_value = Yes AND
         average_quarterly = Yes AND
         current_status_values = Yes AND
         substitute1 = Yes AND
         combined_demand_for_orig_&_subs_NSNs = No AND
         multiple_dues_values = No AND
         dues_supply_status = The_status_is_other_than_BA_BV_or_AS
THEN     conclusion = canc_excess
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  The excess qty should be
cancelled.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 1-RULE 10 */
RULE 10
IF      variable_ranking_group = Group_One AND
        extended_money_value = Yes AND
        average_quarterly = Yes AND
        current_status_values = Yes AND
        substitute1 = Yes AND
        combined_demand_for_orig_&_subs_NSNs = No AND
        multiple_dues_values = No AND
        dues_supply_status = The_status_on_the_due_is_BA_BV_or_AS
THEN    conclusion = no_canc
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  None of the dues can be cancelled.
No action
is recommended.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";



!/* 1-RULE 11 */
RULE 11
IF      variable_ranking_group = Group_One AND
        extended_money_value = Yes AND
        average_quarterly = Yes AND
        current_status_values = Yes AND
        substitute1 = Yes AND
        combined_demand_for_orig_&_subs_NSNs = Yes
THEN    conclusion = ret_due
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  The due should be retained in file.
No
action is recommended.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 1-RULE 12 */
RULE 12
IF      variable_ranking_group = Group_One AND
        extended_money_value = Yes AND
        average_quarterly = Yes AND
        current_status_values = No
THEN    conclusion = canc_rod
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  Cancel the due and forward the
appropriate ROD
information.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";



!/* 1-RULE 13 */
RULE 13
IF      variable_ranking_group = Group_One AND
        extended_money_value = Yes AND
        average_quarterly = No AND
        dues_supply_status =
                Neither_BB_nor_BD_with_future_EDD_avail  AND
        financial_values = Yes
THEN    conclusion = canc_rod
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  Cancel the due and forward the
appropriate ROD
information.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 1-RULE 14 */
RULE 14
IF      variable_ranking_group = Group_One AND
        extended_money_value = Yes AND
        average_quarterly = No AND
        dues_supply_status =
                Neither_BB_nor_BD_with_future_EDD_avail  AND
        financial_values = No
THEN    conclusion = canc_obl
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Cancel the due and the
obligation.

                                Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";



!/* 3-RULE 1 */
RULE 15
IF      variable_ranking_group = Group_Three AND
        backorder_values = No
THEN    conclusion = no_action
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                                Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 3-RULE 2 */
RULE 16
IF      variable_ranking_group = Group_Three AND
        backorder_values = Yes AND
        replinishment_indicator = No
THEN    conclusion = zyl_by
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process a ZYL using a 7
bypass code.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";

!/* 3-RULE 3 */
RULE 17
IF      variable_ranking_group = Group_Three AND
        backorder_values = Yes AND
        replinishment_indicator = Yes AND
        dues_established = Yes
THEN    conclusion = no_action
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 3-RULE 4 */
RULE 18
IF      variable_ranking_group = Group_Three AND
        backorder_values = Yes AND
        replinishment_indicator = Yes AND
        dues_established = No
THEN    conclusion = zyl_by_off
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  Process a ZYL using a 7 bypass code
or start
an offline buy if the procurement must be initiated immediately.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";



!/* 5-RULE 1 */
RULE 19
IF      variable_ranking_group = Group_Five AND
        replinishment_indicator = Yes AND
        dues_established = Yes
THEN    conclusion = no_action
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 5-RULE 2 */
RULE 20
IF      variable_ranking_group = Group_Five AND
        replinishment_indicator = Yes AND
        dues_established = No
THEN    conclusion = zyl_by
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process a ZYL using a 7
bypass code.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";



!/* 5-RULE 3 */
RULE 21
IF      variable_ranking_group = Group_Five AND
        replinishment_indicator = No AND
        index_code_values = No
THEN    conclusion = zyl_by
WCPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process a ZYL using a 7
bypass code.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 5-RULE 4 */
RULE 22
IF      variable_ranking_group = Group_Five AND
        replinishment_indicator = No AND
        index_code_values =
                Yes_there_is_an_index_code_of_P_or_S  AND
        on_hand_stock = Yes
THEN    conclusion = no_action
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  No action is required.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";



!/* 5-RULE 5 */
RULE 23
IF      variable_ranking_group = Group_Five AND
        replinishment_indicator = No AND
        index_code_values =
                Yes_there_is_an_index_code_of_P_or_S  AND
        on_hand_stock = No
THEN    conclusion = zyl_by
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:  Process a ZYL using a 7
bypass code.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!/* 5-RULE 6 */
RULE 24
IF      variable_ranking_group = Group_Five AND
        replinishment_indicator = No AND
        index_code_values = Yes_index_code_of_other_than_Y_P_or_S
THEN    conclusion = refer
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  Refer to Standard Data Reference or
request
supervisory assistance.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";


!/* 5-RULE 7 */
RULE 25
IF      variable_ranking_group = Group_Five AND
        replinishment_indicator = No AND
        index_code_values = Yes_there_is_an_index_code_of_Y
THEN    conclusion = zyl_replace
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "
The system's conclusion is:  Process a ZYL against the replacement
NSN.

                              Press ANY key to continue.~"
WCLOSE 1
BECAUSE "";
```

```
!                    This is a catchall or default rule in case
!     *----------     the user answers a question or inputs values
!     |              for which the rule base was not prepared
!     |              to evaluate.
!     |
!     |
!     V

RULE 26
IF    variable_ranking_group = Group_One OR
      variable_ranking_group = Group_Three OR
      variable_ranking_group = Group_Five
THEN conclusion = NO_PRESENT_RULE_BASE_SOLUTION
WOPEN 1,1,1,14,77,3
ACTIVE 1
DISPLAY "The system's conclusion is:

!!!!   SORRY   !!!!   SORRY   !!!!   SORRY   !!!!   SORRY   !!!!


THERE IS NO PRESENT SOLUTION FOR THE INPUTS THAT YOU GAVE TO
THE SYSTEM. I REALIZE HOW FRUSTRATING THIS IS. PLEASE SEE ONE
OF YOUR SUPERVISORS ON RESOLVING THE PROBLEM, AND GIVE HIM THE
ANSWERS YOU PROVIDED TO THE SYSTEM.


                                        Press ANY key to continue.~";


ASK variable_ranking_group: "What Variable Ranking Group is the
item ?";
CHOICES    variable_ranking_group:    Group_One,    Group_Three,
Group_Five;


ASK extended_money_value:
"Is the extended money value (EMV) of the excess on order greater
than 500 dollars?";

CHOICES extended_money_value: Yes, No;


ASK average_quarterly:
"Is the qty in excess greater than the average quarterly demand
(ADQ)?";
```

```
CHOICES average_quarterly: Yes, No;


ASK current_status_values: "Is the current status for the due on
file?";

CHOICES current_status_values: Yes, No;


ASK substitutel: "Is there a substitute NSN?";

CHOICES substitutel: Yes, No;


ASK multiple_dues_values: "Are there multiple dues?";

CHOICES multiple_dues_values: Yes, No;


ASK dues_supply_status: "What is the supply status of the due (or
dues)?";

CHOICES dues_supply_status:
DUE_status_is_BB_or_BD_with_future_EDD,
1_or_more_DUES_is_not_BA_BV_or_AS,
All_DUES_have_status_of_BA_BV_or_AS,
The_status_is_other_than_BA_BV_or_AS,
The_status_on_the_due_is_BA_BV_or_AS,
Neither_BB_nor_BD_with_future_EDD_avail;


ASK combined_demand_for_orig_&_subs_NSNs: "Does the combined
demand for the
original and substitute NSNs account for the excess?";

CHOICES combined_demand_for_orig_&_subs_NSNs: Yes, No;


ASK financial_values: "Are the funds in MIT ?";

CHOICES financial_values: Yes, No;
ASK backorder_values: "Are there backorders on the NSN?";

CHOICES backorder_values: Yes, No;
```

```
ASK replinishment_indicator: "Is there a replenishment
indicator?";

CHOICES replinishment_indicator: Yes, No;


ASK dues_established: "Is a due being established?";

CHOICES dues_established: Yes, No;


ASK index_code_values: "Is there an index code?";

CHOICES index_code_values: No,
Yes_there_is_an_index_code_of_P_or_S,
Yes_index_code_of_other_than_Y_P_or_S,
Yes_there_is_an_index_code_of_Y;


ASK on_hand_stock: "Is the on hand stock for both NSNs sufficient
to
cover the demand for each NSN ?";

CHOICES on_hand_stock: Yes, No;
```

```
!/############################################################/

!    The following rule base is the HAZARDOUS MATERIALS expert
!    system.


!            HAZARDOUS MATERIAL EXPERT SYSTEM RULE BASE
!
!    This rule base was developed in VP-EXPERT by LCDR England,
!    who was still making refinements at the time this rule base
!    was incorporated into the Integrated Inventory Mangement
!     System.


!  These first group of statements instruct the system and
!  provide the initial greeting to the user;

RUNTIME;
ACTIONS
WOPEN 1,1,1,14,77,3
ACTIVE 1
     DISPLAY "     The Hazardous Material Expert System will
provide you with advice on the proper storage for recently
received, ready-for-issue, hazardous materials.  Whenever
possible a specific storeroom location will be recommended.

        In addition, the user may ask this expert system to will

provide specific information on an items flash point, reactivity,

or disposal.



     Press any key to begin the consultation.~"
WCLOSE 1
!     CLS
     FIND Storage;

!  These rules will provide the storage solution if no
!  information is needed for reactivity, flash point, or
!  disposal.
```

```
RULE 1
IF    Hazard = Explosive  AND
      Flash_Point = No    AND
      Reactivity = No     AND
      Disposal = No
THEN
      Storage = OK

WOPEN 1,1,1,9,77,3
ACTIVE 1
DISPLAY "

THIS EXPLOSIVE MATERIAL SHOULD BE STORED IN A FLAMMABLE STOREROOM

WITH AN INSTALLED HALON FIRE FIGHTING SYSTEM.

STOREROOM NUMBER 27 IS AN IDEAL LOCATION.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 2
IF Hazard = Acid          AND
      Flash_Point = No    AND
      Reactivity = No     AND
      Disposal = No
THEN
      Storage = Ok

      WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS ACID MATERIAL SHOULD BE STORED IN AN ACID LOCKER
THAT DOES NOT CONTAIN COMBUSTIBLES, OXIDIZERS, OR ALKALINE
MATERIALS.

STOREROOM NUMBER 16 IS AN IDEAL LOCATION.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 3
IF Hazard = Toxic          AND
     Flash_Point = No      AND
     Reactivity = No       AND
     Disposal = No
THEN
     Storage = Ok

     WOPEN 1,1,1,11,77,3
ACTIVE 1
DISPLAY "

THIS TOXIC MATERIAL MAY BE STORED IN ANY AREA THAT DOES
NOT CONTAIN ACIDS, COMBUSTIBLES, OR OXIDIZING
MATERIALS.

STOREROOM NUMBER 7 IS AN IDEAL LOCATION, STOREROOM NUMBER 9 WOULD

BE AN ACCEPTABLE LOCATION FOR SHORT-TERM STORAGE.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 4
IF Hazard = Alkaline       AND
     Flash_Point = No      AND
     Reactivity = No       AND
     Disposal = No
THEN
     Storage = Ok

     WOPEN 1,1,1,11,77,3
ACTIVE 1
DISPLAY "

THIS ALKALINE MATERIAL MAY BE STORED IN ANY GENERAL
STOREROOM THAT DOES NOT CONTAIN ACIDS, COMBUSTIBLES,
OR OXIDIZERS.

STOREROOM NUMBER 6 IS AN IDEAL LOCATION, STOREROOM NUMBER 9 WOULD

BE AN ACCEPTABLE LOCATION FOR SHORT-TERM STORAGE.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 5
IF Hazard = Combustible  AND
     Flash_Point = No    AND
     Reactivity = No     AND
     State = Liquid      AND
     Disposal = No
THEN
     Storage = Ok

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS COMBUSTIBLE MATERIAL MAY BE STORED IN A GENERAL STOREROOM
WITH AN AMBIENT TEMPERATURE OF LESS THAN 125 DEGREES FAHRENHEIT.


STOREROOM NUMBER 25 IS AN IDEAL LOCATION, STOREROOM NUMBER 27
WOULD BE AN ACCEPTABLE LOCATION FOR SHORT-TERM STORAGE.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 6
IF Hazard = Combustible  AND
     Flash_Point = No    AND
     Reactivity = No     AND
     State = Solid       AND
     Disposal = No
THEN
     Storage = Ok

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS COMBUSTIBLE MATERIAL SHOULD BE STORED IN A FLAMMABLE
STOREROOM WITH AN INSTALLED HALON FIRE FIGHTING SYSTEM.

STOREROOM NUMBER 27 IS AN IDEAL LOCATION.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 7
IF Hazard = Flammable     AND
     State = Liquid       AND
     Flash_Point = No     AND
     Reactivity = No      AND
     Disposal = No
THEN
     Storage = Ok

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS FLAMMABLE MATERIAL SHOULD BE STORED IN A FLAMMABLE
STOREROOM WITH AN INSTALLED HALON FIRE FIGHTING SYSTEM.

STOREROOM NUMBER 27 IS AN IDEAL LOCATION.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 8
IF Hazard = Flammable     AND
     State = Gas          AND
     Flash_Point = No     AND
     Reactivity = No      AND
     Disposal = No
THEN
     Storage = Ok

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS FLAMMABLE MATERIAL SHOULD BE STORED IN A COMPRESSED GAS
STOREROOM.

STOREROOM NUMBER 36 IS AN IDEAL LOCATION.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 9
IF Hazard = Flammable     AND
     State = Solid        AND
     Flash_Point = No     AND
     Reactivity = No      AND
     Disposal = No
THEN
     Storage = Ok

     WOPEN 1,1,1,8,77,3
ACTIVE 1
DISPLAY "

THIS FLAMMABLE MATERIAL SHOULD BE STORED IN A FLAMMABLE
STOREROOM WITH AN INSTALLED HALON FIRE FIGHTING
SYSTEM.

STOREROOM NUMBER 27 IS AN IDEAL LOCATION.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 10
IF Hazard = Oxidizer      AND
     Flash_Point = No     AND
     Reactivity = No      AND
     Disposal = No
THEN
     Storage = Ok

     WOPEN 1,1,1,9,77,3
ACTIVE 1
DISPLAY "

THIS OXIDIZING MATERIAL MAY BE STORED IN ANY GENERAL
STOREROOM THAT DOES NOT CONTAIN ACIDS, COMBUSTIBLES, OR
ALKALINE MATERIAL.

STOREROOM NUMBER 5 IS AN IDEAL LOCATION, STOREROOM NUMBER 9 WOULD

BE AN ACCEPTABLE LOCATION FOR SHORT-TERM STORAGE.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 11
IF Hazard = Poison        AND
     Flash_Point = No     AND
     Reactivity = No      AND
     Disposal = No
THEN
     Storage = Ok

     WOPEN 1,1,1,7,77,3
ACTIVE 1
DISPLAY "

THIS POISONOUS MATERIAL MAY BE STORED IN A GENERAL
STOREROOM.

STOREROOM NUMBER 11 IS AN IDEAL LOCATION.

                          Press ANY key to continue.~"
WCLOSE 1;

!  This rule instructs the user on how to obtain information on

!  the general hazard of the item if it is not known.

RULE 12
IF Hazard = Uncertain
THEN
     Storage = Info

     WOPEN 1,1,1,8,77,3
ACTIVE 1
DISPLAY "

OBTAIN THE MATERIAL SAFETY DATA SHEET (MSDS) THAT
ACCOMPANIED THIS MATERIAL AND DETERMINE THE GENERAL HAZARD
ASSOCIATED WITH THIS MATERIAL. IF AN MSDS IS NOT AVAILABLE
CONTACT THE SUPPLY CENTER HEALTH AND SAFETY MANAGER FOR
ADDITIONAL ASSISTANCE.

                          Press ANY key to continue.~"
WCLOSE 1;

!  These rules provide information on the flash point of the
!  various types of material.
```

```
RULE 13
IF Hazard = Toxic          AND
     Flash_Point = Yes
THEN
     Storage = info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THE FLASH POINT FOR THIS TOXIC MATERIAL IS HIGHER THAN
200 DEGREES FAHRENHEIT.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 14
IF Hazard = Combustible  AND
     State = Liquid      AND
     Flash_Point = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THE FLASH POINT OF THIS COMBUSTIBLE MATERIAL IS LESS THAN 125
DEGREES FAHRENHEIT AND APPROPRIATE CAUTION SHOULD BE EXERCISED.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 15
IF Hazard = Combustible  AND
     State = Solid       AND
     Flash_Point = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THE FLASH POINT OF THIS COMBUSTIBLE MATERIAL IS LESS THAN 200
DEGREES FAHRENHEIT.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 16
IF Hazard = Flammable    AND
     Flash_Point = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THE FLASH POINT OF THIS FLAMMABLE MATERIAL IS LOWER THAN 100
DEGREES FAHRENHEIT, APPROPRIATE CAUTION SHOULD BE EXERCISED.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 17
IF Hazard = Explosive  AND
     Flash_Point = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THE FLASH POINT OF THIS EXPLOSIVE MATERIAL IS LESS THAN 73
DEGREES FAHRENHEIT, APPROPRIATE CAUTION SHOULD BE EXERCISED.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 18
IF Hazard = Alkaline      AND
     Flash_Point = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THE FLASH POINT OF THIS ALKALINE MATERIAL EXCEEDS 200
DEGREES FAHRENHEIT.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 19
IF Hazard = Oxidizer      AND
     Flash_Point = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THE FLASH POINT FOR THIS OXIDIZING MATERIAL IS LESS THAN 200
DEGREES FAHRENHEIT.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 20
IF Hazard = Poison        AND
     Flash_Point = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THE FLASH POINT OF THIS POISONOUS MATERIAL IS IN EXCESS OF
225 DEGREES FAHRENHEIT.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 21
IF Hazard = Acid          AND
     Flash_Point = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THE FLASH POINT OF THIS ACIDIC MATERIAL IS LESS THAN 200
DEGREES FAHRENHEIT.

                          Press ANY key to continue.~"
WCLOSE 1;

!  These rules provide information for the disposal of the
!  various types of material.

RULE 22
IF   Hazard = Explosive  AND
     Disposal = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS EXPLOSIVE MATERIAL SHOULD BE RETURNED TO THE
MANUFACTURER IF DISPOSAL IS REQUIRED.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 23
IF Hazard = Toxic          AND
     Disposal = Yes
THEN
     Storage = info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

 IN ORDER TO DISPOSE OF THIS TOXIC MATERIAL MIX IT WITH SOIL.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 24
IF Hazard = Combustible  AND
     State = Solid       OR
     State = Liquid      AND
     Disposal = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

IN ORDER TO DISPOSE OF THIS COMBUSTIBLE MATERIAL MIX IT WITH
SOIL RICH IN ORGANIC MATERIAL.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 25
IF Hazard = Flammable     AND
     State = Liquid       AND
     Disposal = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

IN ORDER TO DISPOSE OF THIS FLAMMABLE MATERIAL MIX ANY
UNCOMBINED PORTIONS AND MIX THE RESULTING PRODUCT WITH SOIL
RICH IN ORGANIC MATERIALS.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 26
IF Hazard = Flammable     AND
     State = Gas          AND
     Disposal = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

IN ORDER TO DISPOSE OF THIS FLAMMABLE MATERIAL CONFIRM THAT
IT IS NOT TOXIC AND VENT IT TO THE ATMOSPHERE.  IF THE GAS IS
TOXIC IT MUST BE RETURNED TO THE MANUFACTURER OR SUPPLIER FOR
DISPOSAL.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 27
IF Hazard = Flammable     AND
     State = Solid        AND
     Disposal = Yes
THEN
     Stcrage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

IN ORDER TO DISPOSE OF THIS FLAMMABLE MATERIAL SLOWLY ADD IT
TO A SMALL CONTAINER OF WATER
WCLOSE 1; THEN WASH THE FILTRATE TO A SEWER
DRAIN AND BURY THE REMAINING SLUDGE.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 28
IF Hazard = Alkaline      AND
     Disposal = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

IN ORDER TO DISPOSE OF THIS ALKALINE MATERIAL DILUTE IT WITH
EXCESSIVE WATER AND THEN DISPOSE OF THE RESULTING PRODUCT IN A
SANITARY SEWER DRAIN.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 29
IF Hazard = Oxidizer      AND
     Disposal = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

IN ORDER TO DISPOSE OF THIS OXIDIZING MATERIAL MIX IT WITH
SOIL.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 30
IF Hazard = Poison        AND
     Disposal = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS POISONOUS MATERIAL SHOULD BE RETURNED TO THE
MANUFACTURER OR SUPPLIER FOR DISPOSAL.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 31
IF Hazard = Acid          AND
     Disposal = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

IN ORDER TO DISPOSE OF THIS ACIDIC MATERIAL MIX IT WITH A
BASE MATERIAL AND THEN WASH THE RESULTING PRODUCT TO A SANITARY

SEWER DRAIN.

                          Press ANY key to continue.~"
WCLOSE 1;

!  These rules provide information in regards to the reactivity

!  of the various types of material.

RULE 32
IF Hazard = Toxic         AND
     Reactivity = Yes
THEN
     Storage = info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS TOXIC MATERIAL IS STABLE.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 33
IF Hazard = Combustible  AND
     State = Solid       OR
     State = Liquid      AND
     Reactivity = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS COMBUSTIBLE MATERIAL CAN BECOME UNSTABLE IF HEATED, KEEP
IT IN A COOL PLACE OUT OF THE DIRECT LIGHT OF THE SUN.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 34
IF Hazard = Flammable AND
     Reactivity = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS FLAMMABLE MATERIAL MAY BECOME UNSTABLE IF HEATED, KEEP
IT IN A COOL PLACE OUT OF THE DIRECT LIGHT OF THE SUN.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 35
IF Hazard = Alkaline      AND
     Reactivity = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS ALKALINE MATERIAL MAY BECOME UNSTABLE IF HEATED, KEEP
IT IN A COOL PLACE OUT OF THE DIRECT LIGHT OF THE SUN.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 36
IF Hazard = Oxidizer      AND
     Reactivity = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS OXIDIZING MATERIAL MAY BECOME UNSTABLE IF HEATED, KEEP
IT IN A COOL PLACE OUT OF THE DIRECT LIGHT OF THE SUN.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 37
IF Hazard = Poison        AND
     Reactivity = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS POISONOUS MATERIAL IS STABLE.

                          Press ANY key to continue.~"
WCLOSE 1;

RULE 38
IF Hazard = Acid          AND
     Reactivity = Yes
THEN
     Storage = Info

     WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS ACIDIC MATERIAL MAY BECOME UNSTABLE IF HEATED, KEEP
IT IN A COOL PLACE OUT OF THE DIRECT LIGHT OF THE SUN.

                          Press ANY key to continue.~"
WCLOSE 1;
```

```
RULE 39
IF    Hazard = Explosive  AND
      Reactivity = Yes
THEN
      Storage = Info

      WOPEN 1,1,1,10,77,3
ACTIVE 1
DISPLAY "

THIS EXPLOSIVE MATERIAL MAY DETONATE, APPROPRIATE CAUTION
SHOULD BE EXERCISED.

                          Press ANY key to continue.~"
WCLOSE 1;

!  The following questions and answers will prompt the user so
!  the system may obtain the information necessary to provide the

!  required storage information.

ASK Hazard: "What is the primary hazard associated with the
material you need storage information about? (If a secondary
hazard is associated with the material an additional consultation

should be run.)";
CHOICES Hazard: Explosive, Toxic, Combustible, Flammable,
Alkaline, Oxidizer, Poison, Acid, Uncertain;

ASK State: "What is the physical state of the material
you need storage information about?";
CHOICES State: Solid, Liquid, Gas;

ASK Flash_Point:  Do you need information on the flash point
of the material you are considering for storage?";
CHOICES Flash_Point: No, Yes;

ASK Reactivity: "Do you need information on regarding the
reactivity of the material you are considering for storage?";
CHOICES Reactivity: No,Yes;

ASK Disposal: "Do you need information regarding the disposal of

the material you are considering for storage?";
CHOICES Disposal: No,Yes;
```

```
!/############################################################/
!
!                    INTEGRATION MODULE
!
!    The following rule base is the integration module (or
!    main module) of the Integrated Inventory Management Expert
!    System. It is this module that calls the help rule base and
!    which calls the other rule bases at any one time. The
!    present configuration allows for the following rule bases
!    to be called: Help (HELP.KBS), Causative Research
!    (DOLMOD.KBS), Dues Management (POTMOD.KBS), Variable
!    Ranking Lists (VRANKMOD.KBS), Hazardous Materials
!    (HAZMAT.KBS), and two other rule bases which are not yet
!    implemented.


!ENDOFF;
ACTIONS
   FIND call_help_file
   FIND show_all_the_text
   FIND stop;

RULE 0A
IF   skip_need_help = yes
THEN call_help_file = do_not_activate
ELSE call_help_file = activate
CHAIN help;
```

```
Rule 0
IF    skip = no
THEN  show_all_the_text = yes
CLS
WOPEN 1,1,1,16,77,3
ACTIVE 1
DISPLAY "                                   A N

          I N T E G R A T E D   E X P E R T   S Y S T E M

                              F O R

        I N V E N T O R Y   M A N A G E R S   A T   N A V Y

          R E T A I L   S U P P L Y   S T O C K   P O I N T S

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                                                        Press any
Key~"
WCLOSE 1


WOPEN 1,1,1,14,77,3
ACTIVE 1
DISPLAY "  WELCOME TO THE INTEGRATED INVENTORY MANAGEMENT EXPERT
SYSTEM
FOR NAVY STOCK POINTS. THIS PROGRAM ALLOWS THE USER TO CHOOSE ONE
OF A SELECTION OF EXPERT SYSTEM PROGRAMS THAT HAVE BEEN WRITTEN
BY OTHER THESIS STUDENTS.
  THIS PROGRAM REPRESENTS AN EFFORT TO CONVERT THREE RULE BASES
AND INTEGRATE THEM INTO ONE UNIT. THIS VERSION OF THE INTEGRATED
SYSTEM RETURNS YOU TO TO THIS MASTER CONTROL MODULE AFTER RUNNING
A CONSULTATION. ONCE YOU HAVE RETURNED TO THE MASTER CONTROL
MODULE, YOU CAN EITHER QUIT OR RUN ANOTHER EXPERT SYSTEM
CONSULTATION. JUST SELECT 'Go' and PRESS 'Enter'.
  MORE MODIFICATIONS AND TESTING OF THE INTEGRATION ISSUES WILL
BE FORTHCOMING.
                                                  Press any Key.~"
WCLOSE 1;
```

```
RULE 00
IF   continue_consultation = No
THEN stop = Yes
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "                THAT CONCLUDES THIS CONSULTATION OF THE
NAVAL
                    POSTGRADUATE SCHOOL EXPERT SYSTEM.

                                                                Press
any Key~"
ELSE stop = No
FIND goal;



RULE 1
IF    selection = Selection_1
THEN  goal = Causative_Research
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "                You have chosen the Causative Research
Program.
            THIS PROGRAM TAKES ABOUT ONE MINUTE TO LOAD.
          PLEASE BE PATIENT WHILE THE SYSTEM LOADS THE PROGRAM.

                   Press any KEY to execute the program!~"
CHAIN dolmod
BECAUSE "
Here are the selections and the names of the corresponding
knowledge bases:

Selection 1:   Causative Research
Selection 2:   Delinquent Dues and System Cancellations
Selection 3:   Hazardous Materials
Selection 4:   Variable Rankings";

!CHAIN dolmod;
```

```
RULE 2
IF    selection = Selection_2
THEN  goal = Del_Dues_and_Sys_Canx
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "              You have chosen the Delinquent Dues
               and System Cancellations Program.
               THIS PROGRAM TAKES ABOUT ONE MINUTE TO LOAD.
                   Press any KEY to execute the program!~"
CHAIN potmod
BECAUSE "
Here are the selections and the names of the corresponding
knowledge bases:

Selection 1:   Causative Research
Selection 2:   Delinquent Dues and System Cancellations
Selection 3:   Hazardous Materials
Selection 4:   Variable Rankings";


!CHAIN potmod;
```

```
RULE 3
IF    selection = Selection_3
THEN  goal = Hazardous_Materials
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "          This is the Hazardous Materials Program.
THIS PROGRAM IS NOT YET IMPLEMENTED. HOWEVER, PRESS ANY KEY
AND YOU WILL BE SHOWN A DEMO. THE DEMO WILL BE REPLACED
IN THE NEAR FUTURE.                          Press any key.~"
CLS
DISPLAY "                You have chosen the Hazardous Materials
Program.
              THIS PROGRAM TAKES ABOUT ONE MINUTE TO LOAD.
           PLEASE BE PATIENT WHILE THE SYSTEM LOADS THE PROGRAM.

                   Press any KEY to execute the program!~"
CHAIN hazmat
BECAUSE "
Here are the selections and the names of the corresponding
knowledge bases:

Selection 1:   Causative Research
Selection 2:   Delinquent Dues and System Cancellations
Selection 3:   Hazardous Materials
Selection 4:   Variable Rankings";
```

```
RULE 4
IF    selection = Selection_4
THEN  goal = Variable_Rankings
WOPEN 1,1,1,5,77,3
ACTIVE 1
DISPLAY "                You have chosen the Variable Rankings
Program.
            THIS PROGRAM TAKES ABOUT ONE MINUTE TO LOAD.
          PLEASE BE PATIENT WHILE THE SYSTEM LOADS THE PROGRAM.

                  Press any KEY to execute the program!~"
CHAIN vrankmod
BECAUSE "
Here are the selections and the names of the corresponding
knowledge bases:

Selection 1:   Causative Research
Selection 2:   Delinquent Dues and System Cancellations
Selection 3:   Hazardous Materials
Selection 4:   Variable Rankings";

!CHAIN vrankmod;


ASK selection: "
Press any key to get the listing of programs that will be
offered to you:
~
Selection 1:   Causative Research
Selection 2:   Delinquent Dues and System Cancellations
Selection 3:   Hazardous Materials
Selection 4:    Variable Rankings                    <<PRESS any
KEY!!!>>~";
CHOICES   selection:   Selection_1,   Selection_2,   Selection_3,
Selection_4;


ASK  continue_consultation:  "Do  you  wish  to  CONTINUE  the
consultation?";
CHOICES continue_consultation: Yes, No;


ASK skip: "
Do you wish to skip the opening statements?";
CHOICES skip: Yes, No;
```

```
ASK skip_need_help: "Do you want to skip the HELP system?
(The HELP system is a knowledge base that provides you
with additional information)";
CHOICES skip_need_help: yes,no;
```

```
!/############################################################/

!                    THE HELP RULE BASE

!    The following rule base is the HELP rule base which calls
!    the hypertext help file, HELP.TXT. This file was written
!    by LT Rouska to demonstrate one possible implementation of
!    a help system. This program uses some of the graphics
!    features of VP-EXPERT.


RUNTIME;
EXECUTE;
ACTIONS
GMODE 16
MOUSEOFF
Topics = start

Mouseavail = unknown
whiletrue  Topics  <> QUIT
THEN END
TMODE;
!CHAIN INTMOD;


HYPERTEXT Topics: 3,3,75,24,Help1,2,7;

Whenever Mouseavail
IF Mouseavail = No
Then mouseoff;

Whenever Mouseavail
IF Mouseavail= Yes
Then mouseon
Exit = No
Return_Button = No;

WHENEVER Topics
IF Topics = RETURN
THEN Topics = start;

WHENEVER Exit
IF Exit = Yes
THEN topics = Quit;
```

```
WHENEVER Return_Button
IF Return_Button = Yes
Then Topics = start;


LBUTTON Exit: 40,2,3,4,EXIT;
LBUTTON Return_Button: 50,2,3,6,RETURN;

FORMFIELD Topics: 10,2,25,3;
ASK Topics: "Topics?";

FORMFIELD Mouseavail: 67,2,8,3;

ASK Mouseavail: "MOUSE?";
choices Mouseavail: Yes,No;



!/############################################################/

!         PROVISION FOR ADDITION OF FUTURE RULE BASE

!    The code that follows is to demonstrate how easy it is
!    to add a new rule base to the integrated system. Simply
!    run this rule base and it provides you with instructions
!    on what changes to make to integrate your rule base with
!    the system as it is presently configured.


ENDOFF;
ACTIONS
WOPEN 1,1,1,11,77,3
ACTIVE 1
DISPLAY "
                  N A V Y    S T O C K    P O I N T S

                ( P U T    N A M E    O F    E X P E R T
                        S Y S T E M    H E R E )

                     E X P E R T    S Y S T E M


                                                Press any Key~"
WCLOSE 1
```

```
WOPEN 1,1,1,7,77,3
ACTIVE 1
DISPLAY "
This simple rule base is presented to show you, the user, what
an opening screen for a new rule base that you wish to add might
look like.


                                                    Press any Key~"
WCLOSE 1

        FIND conclusion

WOPEN 1,1,1,5,77,3
ACTIVE 1
        DISPLAY "

              Press any key to return to the Main Menu.

~"
        CHAIN intmod;
```

```
RULE 1
IF answer = yes
THEN conclusion = user_wants_instructions
WOPEN 1,1,1,16,77,3
ACTIVE 1
DISPLAY "   To remove this rule base and insert the new
rule base, use a text editor to enter the rule base called
intmod.kbs.

Go to rule number 3 and change the CHAIN statement that reads
CHAIN hazmat to CHAIN <name of your new file>. Don't include the
kbs extension or you will get an error. Also, don't include the
< > symbols.

   This should be all you have to change. Exit and save the
changes you made to intmod.kbs, load vpx.exe and then load
intmod.kbs. Your own expert system should now run from the
integration module.

                                          <<< Press any Key >>>~"
WCLOSE 1
ELSE conclusion = user_wants_to_skip_instructions
WOPEN 1,1,1,8,77,3
ACTIVE 1
DISPLAY "
   Since you don't want to know about how to install the actual
expert system for HAZARDOUS MATERIALS, press any key and return
to the main program. From there you can select another expert
system or exit the main program.

                                                  Press any Key~"
WCLOSE 1
CHAIN intmod;          ! The CHAIN statement acts like a subroutine
                       ! call and makes the intmod rule base the
                       ! active rule base. All results obtained from
                       ! the consultation with this rule base are
                       ! lost. See the VP-EXPERT Reference manual
                       ! for information on how to store and save
                         consultation results.


ASK answer: "Do you want instructions on how to install the new
Hazardous Materials
Expert System?";
CHOICES answer: Yes, No;
```

APPENDIX C. LISTING OF THE INTEGRATED SYSTEM HELP FILE

This is a listing of the contents of the hypertext help file called HELP.TXT. Although primitive, it establishes how a help file for the integrated system might be set up. VP-EXPERT hypertext files are called from VP-EXPERT rule bases. VP-EXPERT makes writing help files in hypertext very easy. There are only two primary restrictions that one should know when writing hypertext files. One is that a VP-EXPERT hypertext screen (also known as a frame) can be no longer than 23 lines of text. Start counting the first line as the next row below a hypertext hyperword. A hypertext hyperword consists of an "*" followed by whatever word one wishes to use (there is no space between the asterisk (*) and the keyword.

In hypertext, one can can link frames one after the other by placing the hyperword for the next successive screen anywhere in the previous frame. Hypertext was chosen for a help system implementation because it is easy to modify or create. It was for this reason and the concern for making maintenance on the system as easy as possible that hypertext was chosen. For more information of using hypertext, see the VP-EXPERT Reference Manual.

*start
If you are familiar with using this system select Topics now.

This is the main IHELP file created for the VP-EXPERT integration prototype. This IHELP file uses HYPERTEXT, which, las you will find, is very powerful.

To start the IHELP system, press the [Tab] key and select Yes if you have a Imouse, or no if you do not.

DO NOT SELECT YES FOR Imouse? (Upper right hand corner) IF YOU DO NOT HAVE A Imouse OR ELSE THE SYSTEM WILL LOCK UP. IF THE SYSTEM LOCKS UP YOU WILL
HAVE TO SHUT THE POWER OFF OR REBOOT THE SYSTEM.

If you have a Imouse, place the Imouse on the word mouse (in CAPITAL WHITE LETTERS), and click it. Instructions will follow.

If you do not have a Imouse, press the [Tab] key and the Topics block in the upper left hand section of the screen will go blank. Type in Nomouse, and you will be given further instructions.

If you need IHELP at any time, type in HELP.

*Mouse
To use this system with a Imouse, you can place the Imouse on any word in white capital letters, click the Imouse, and it will call up the hypertext screen associated with that word.

Even after you activate the Imouse, if you wish to use the text mode, do the following: press the [Tab] key and the Topics block in the upper left hand section of the screen will go blank. Then type in the word you wish to know more about, and information on that subject will be displayed to you.

Select topics for a list of topics.

*Nomouse

To use the !HELP system without a !mouse, press the [Tab] key. Note that the block marked Topics? in the upper left hand section of the screen will go blank. Type in a single word (or words connected by the underscore (_) symbol). If the subject exists in the !HELP file, you will see a screen appear with information about the subject. If the subject doesn't exist, the screen will go blank. If this happens, use the [Tab] key to enter the word Topics in the topics block. This will give you a list of topics.

Type topics to get the topics menu.

*Topics

When you have a topic in mind, choose the menu below which starts with the first letter of the your topic. For example, if you want to find out about !accounts_payable, select !Menu_A. When this menu is selected, it will show you the topics listed under that menu.

Menu_A	Menu_B	Menu_C	Menu_D	Menu_E	Menu_F
!Menu_G	Menu_H	Menu_I	Menu_J	Menu_K	Menu_L
Menu_M	Menu_N	Menu_O	Menu_P	Menu_Q	Menu_R
Menu_S	Menu_T	Menu_U	Menu_V	Menu_W	Menu_X
Menu_Y	Menu_Z				

To go specifically to a menu listing without haveing to call the Topics menu, press the [Tab] key and enter the word Menu_?, where the ? represents a letter !A through !Z. For example, if you want to go directly to !Menu A, press [Tab], enter Menu_A (include the _ symbol), and press enter. This will call up !Menu_A for you.

Enter Quit to exit the system Type topics to get the topics menu.

*Menu_A
accounts_payable AC1 AF1 AMA as ATA

Enter Quit to exit the system Type topics to get the topics menu.

*Menu_B

Enter Quit to exit the system Type topics to get the topics menu.

*Menu_C
canc_ackn canc_subm classified

For help on CAUSATIVE RESEARCH, type in CR manually or click it with the mouse.

Enter Quit to exit the system Type topics to get the topics menu.

*Menu_D
disb_qty dla

For help with Dues Management, type in DM or click the word DM with a mouseit with a mouse. (This gives you the Dues Management Data Dictionary)

Enter Quit to exit the system Type topics to get the topics menu

*Menu_E

Enter Quit to exit the system Type topics to get the topics menu

*Menu_F
followup fund_code_26

Enter Quit to exit the system Type topics to get the topics menu

*Menu_G

Enter Quit to exit the system Type topics to get the topics menu

*Menu_H

Enter Quit to exit the system Type topics to get the topics menu

*Menu_I

Enter Quit to exit the system Type topics to get the topics menu

*Menu_J

Enter Quit to exit the system Type topics to get the topics menu

*Menu_K

Enter Quit to exit the system Type topics to get the topics menu

*Menu_L

Enter Quit to exit the system Type topics to get the topics menu

*Menu_M
mit

Enter Quit to exit the system Type topics to get the topics menu

*Menu_N
needed nine_cog

Enter Quit to exit the system Type topics to get the topics menu

*Menu_O
obligations

Enter Quit to exit the system Type topics to get the topics menu

*Menu_P
part_ship priority

Enter Quit to exit the system Type topics to get the topics menu

*Menu_Q

Enter Quit to exit the system Type topics to get the topics menu

*Menu_R
rev_edd

Enter Quit to exit the system Type topics to get the topics menu

*Menu_S
status_age status

Enter Quit to exit the system Type topics to get the topics menu

*Menu_T

Enter Quit to exit the system Type topics to get the topics menu

*Menu_U

Enter Quit to exit the system Type topics to get the topics menu

*Menu_V
value

Enter Quit to exit the system Type topics to get the topics menu

*Menu_W

Enter Quit to exit the system Type topics to get the topics menu

*Menu_X

Enter Quit to exit the system Type topics to get the topics menu

*Menu_Y

Enter Quit to exit the system Type topics to get the topics menu

*Menu_Z

Enter Quit to exit the system Type topics to get the topics menu

*HELP

QUIT or EXIT: If you want to exit the program and you are using a lmouse, click the exit button at the top of the screen. If you are not using a lmouse, press the [Tab] key and type QUIT.

TOPICS: If you want to get the listing of topics, type in TOPICS.

Enter Quit to exit the system Type topics to get the topics menu

*accounts_payable
accounts_payable: z67
expression to determine if funds are in accounts payable.

Enter Quit to exit the system Type topics to get the topics menu

*canc_ackn
canc_ackn: If Receipt Due File record is no longer available, or you receive a "no locate" on inquiry file.

Enter Quit to exit the system Type topics to get the topics menu

*canc_subm
canc_subm: if in doubt, submit another cancellation.

Enter Quit to exit the system Type topics to get the topics menu

*classified
classified: MSIR (Master Stock Item Record) XVK inquiry security codes found in NAVSUP-437, APP 17, section R: Security codes.

Enter Quit to exit the system Type topics to get the topics menu

*disb_qty
disb_qty: z67

Enter Quit to exit the system Type topics to get the topics menu

*dla
dla: DLA materials

Enter Quit to exit the system Type topics to get the topics menu

*followup
followup: computer generated followups from Receipt Due File (if unsure assume followup not submitted)

Enter Quit to exit the system Type topics to get the topics menu

*fund_code_26
fund_code_26: Receipt Due File, Delinquent Due Listing and z67

Enter Quit to exit the system Type topics to get the topics menu

*mit
mit: z67

Enter Quit to exit the system Type topics to get the topics menu

*needed
needed: From XVK, make judgement based on demand.

Enter Quit to exit the system Type topics to get the topics menu

*nine_cog
nine_cog: XVK, Receipt Due File, z67

Enter Quit to exit the system Type topics to get the topics menu

*obligations
obligations: z67

Enter Quit to exit the system Type topics to get the topics menu

*part_ship
part_ship: Receipt Due File (will show up as suffix code) and History File (inventory causative research)

Enter Quit to exit the system Type topics to get the topics menu

*priority
priority: Delinquent Dues Listing

Enter Quit to exit the system Type topics to get the topics menu

*rev_edd
rev_edd: Delinquent Dues Listing under rev_edd or edd

Enter Quit to exit the system Type topics to get the topics menu

*status_age
status_age: Receipt Due File

Enter Quit to exit the system Type topics to get the topics menu

*status
status: History file, ZRE, AE1, w/bh status card (gives substitute NSN)

Enter Quit to exit the system Type topics to get the topics menu

*value
value: Receipt Due File has unit price x total due in; Delinquent Dues Listing under EMV (Extended Money Value).

Enter Quit to exit the system Type topics to get the topics menu

*AC1
AC1: System cancellation request document.

Enter Quit to exit the system Type topics to get the topics menu

*AF1
AF1: Follow-up document to request updated status.

Enter Quit to exit the system Type topics to get the topics menu

*AMA
AMA: Document modifier, process as requisition if original not received.

Enter Quit to exit the system Type topics to get the topics menu

*AS
AS: Supply status meaning item has been shipped.

Enter Quit to exit the system Type topics to get the topics menu

*ATA
ATA: Follow-up, to be processed as requisition if original requisition not received.

Enter Quit to exit the system Type topics to get the topics menu

*CR

CAUSATIVE RESEARCH GLOSSARY

ADP: automated data processing

AI: artificial intelligence

conf: confidential

DEA: Drug Enforcement Administration

DLA: Defense Logistics Agency

DOCID: Document identifier

DOD: Department of Defense

D9A: document identifier for adjustment transactions - decreases

ea: each

This is Menu_1 Select Start (previous menu) Select Menu_2 for Next Menu

*Menu_2

ES: expert system

FMSO: Fleet Material Support Office

GAO: General Accounting Office

GBI: gain by inventory

GBL: government bill of lading

IAW: in accordance with

ICP: inventory control point

IM: inventory manager

KBS: knowledge based system

LBI: lost by inventory

This is Menu_2 Previous Menu: Menu_1 Select Menu_3 for Next Menu

*Menu_3
MSIR: master stock item record

MTIS: material turned-in to stock

NARF: Naval Aviation Rework Facility

NAS: Naval Air Station

NAVSUP: Naval Supply Systems Command

NAVSUPINST: Naval Supply Systems Command Instruction

NMCS: not mission capable - supply

NSC: Naval Supply Center

NSN: national stock number

RCN: receipt control number

This is Menu_3 Previous Menu: Menu_2 Select Menu_4 for Next Menu

*Menu_4
ROD: Report of Discrepancy

SMIC: special material identification code

SPAR: Stock Point Automated data processing Replacement program

TIR: transaction item report

TLOD: transaction ledger on disk

UADPS-SP: Uniform Automated Data Processing System - Stock Point

USAF: United States Air Force

USN: United States Navy

XXD: document identifier for MSIR inquiries

This is Menu_4 Previous Menu: Menu_3 Select Menu_5 for Next Menu

*Menu_5

ZAT: document identifier for physical inventory adjustment - warehouse refusal, or adjustment - spot inventory corrections

ZAX: document identifier for Navy regular inventory adjustments

ZDG: document identifier for physical inventory suspense file inquiries

ZEL: document identifier for material location change - audit card, or material location establishment - change

ZRD: document identifier for reversal of receipt purged from file, or reversal of stored purged receipt

ZRQ: document identifier for manual review adjustment card, or manual review adjustment transaction

This is Menu_5 Previous Menu: Menu_4 Select Menu_6 for Next Menu

*Menu_6

(ENTER ANY TEXT DESIRED HERE FOR MENU 6)

This is Menu_6 Previous Menu: Menu _5 Select Menu_7 for Next Menu

*DM

DUES MANAGEMENT DATA DICTIONARY

AC1: System cancellation request document.

accounts payable: E:pression to determine if funds are in accounts payable.

AF1: Follow-up document to request updated status.

AMA: Document modifier, process as requisition if original not received.

as: Supply status meaning item has been shipped.

ATA: Follow-up, to be processed as requisition if original requisition not received.

ba: Supply status meaning item is being Processed for shipment.

c-status: Expression to determine system cancellation status.

This is Menu_1 Select Menu_2 for Next Menu

*Menu_2

ca: Supply status meaning the requisition was rejected. This status comes with narrative message stating the reason for the rejection.

canc-ackn: Expression to determine if a cancellation request has been acknowledged.

canc-subm: Expression to determine if a cancellation request has been previously submitted.

category: Expression to determine the age category of the delinquent due.

cg: Supply status meaning the requisition was rejected because holding activity was unable to identify requested item.

cj: Supply status meaning the requisition was rejected because the item is coded (or being coded) obsolete or inactivated. Item in stock number field, if different from the item requisitioned, can be furnished as a substitute.

This is Menu_2 Type start (Previous Menu) Select Menu_3 for Next Menu

*Menu_3

ck: Supply status meaning the requisition was rejected because the item can not be procured. No substitute/interchangeable item is available.

classified: Expression to determine if an item is classified, pilferable or controlled.

cs: Supply status meaning the requisition was rejected because the quantity is suspect of error or indicates excessive quantity.

current-ui: Expression to determine if the current unit of issue on MISR files are valid.

Delinquent Dues: Module of expert system dealing with delinquent dues processing.

disb-qty: Expression to determine if the disbursed quantity is equal to the MIT quantity.

dla: Expression to determine if the requisition for the material is in Defense Logistics Agency (DLA) files.

This is Menu_3 Menu_2 (Previous Menu) Select Menu_4 for Next Menu

*Menu_4

doc-num: Expression to determine if the document number matches the NSN ordered.

Expression: An expression in the terms of this expert system is a symbolic expression that denotes aspects of a situation, such as a characteristic. Expressions have values associated with them that are also symbolic structures. M1's basic operation is to find or accumulate evidence for or against the values of expressions. The values of these expressions are evaluated by the rules of the system in determining the recommended conclusion.

follow-up: Expression to determine if a follow-up has been submitted or not.

fund-code-26: Expression to determine if the requisition is for a fund code 26 item.

less: The age of the most recent supply status is less than 30 days.

This is Menu_4 Menu_3 (Previous Menu) Select Menu_5 for Next Menu

*Menu_5
MISR: Master Item Stock Record. Local stock record.

mit: Expression to determine if funds are in Material In Transit (MIT).

MLN: Master List Navy. Listing of material in the navy supply system with pertinent information.

module: Expression to determine which module of the Dues Management Expert System the user wishes to invoke.

more: The age of the most recent supply status is more than 30 days.

needed: Expression to determine if the material is still needed.

nine-cog: Expression to determine if the requisition is for a 9 cog item.

none: Response to supply status question meaning no supply status has been received.

nsn-val: Expression to determine if the NSN is valid on the status card.

This is Menu_5 Menu_4 (Previous Menu) Select Menu_6 for Next Menu

*Menu_6
obligations: Expression to determine if funds are in obligations.

other: Any supply status other than ba or as.

part-ship: Expression to determine if there has been a partial shipment.

pre-ad: Expression to determine if the item was previously ordered with a 20 advice code.

pri-sat: Subjective judgment of the inventory manager if the requisition priority is satisfactory or not.

qty-excess: Expression to determine if the quantity ordered was excessive based on demand.

req-dem: Expression to determine if the item is still required based on demand.

rev-edd: Expression to determine if a revised/extended EDD has been received.

This is Menu_6 Menu_5 (Previous Menu) Select Menu_7 for Next Menu

*Menu_7
ROD: Report Of Discrepancy.

status-age: The age (in days) of the most recent supply status.

status: The most recent supply status of the requisition.

sub-prov: Expression to determine if a substitute NSN was provided on the CJ status card.

sub: Expression to determine if a substitute has been received.

System Cancellations: Module of expert system dealing' with system cancellation status.

tech-val: Expression to determine if the technical dept (of NSC San Diego) concluded that the item under consideration is a valid substitute.

val-sub: Expression to determine if the substitute item on the status card is a valid substitute in the MLN.

This is Menu_7 Menu_6 (Previous Menu) Select Menu_8 for Next Menu

*Menu_8
value: Expression to determine if the extended money value of a requisition is greater than $100.00.

z67: Expression to determine if a Z67 financial record exists.

This is Menu_8 Menu_7 (Previous Menu) Select Menu_9 for Next Menu

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