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UKRAINE

Power Sector Regulatory Reform and Restructuring

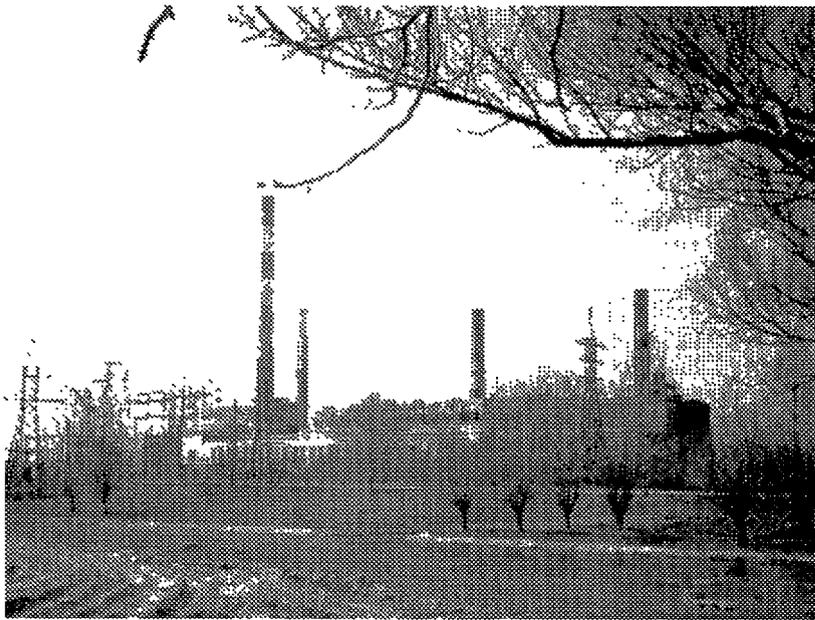
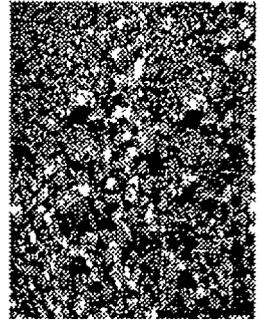
Task - Institutional Development Activity

Delivery Order No. 4-01

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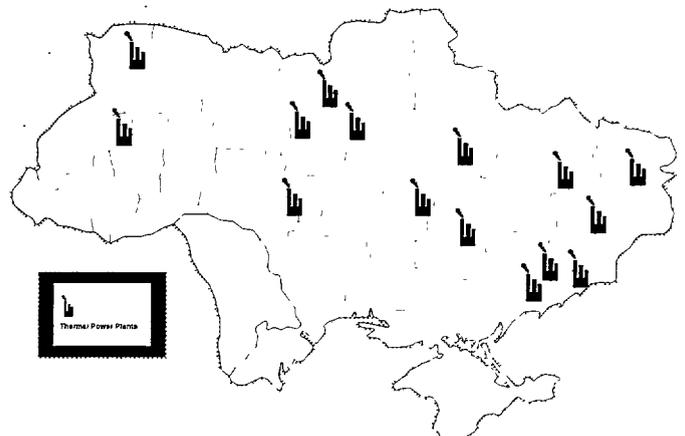
**FINANCIAL
MANAGEMENT
SYSTEM
VOLUME I**

Prepared by:



Price Waterhouse LLP

October 3, 1995



**GENCO FINANCIAL MANAGEMENT
AND ACCOUNTING SYSTEMS**

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**GENCO FINANCIAL MANAGEMENT
AND ACCOUNTING SYSTEMS**

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I. EXECUTIVE SUMMARY

A. Background

A strategy for the market transformation of the power sector of Ukraine was developed and implementation began with the issuance of Presidential Decree No. 244, "Market Transformation Measures in the Power Sector of Ukraine," on May 21, 1994. Steps were taken to break up the formally vertically integrated structure of the Ukraine energy sector headed by the Ministry of Energy. Six joint stock generating companies were created, consisting of two hydroelectric companies and four fossil generating companies (Gencos). The Ukrainian government has agreed to introduce a market based system largely inspired by a model successfully introduced in the United Kingdom in 1990. This is the first former Soviet bloc country to embark on such a radical scheme.

As part of the power sector restructuring process in Ukraine, Price Waterhouse LLP (PW) is advising the Gencos on corporatization and subsequent commercialization. The objectives for this work are:

- to advise and assist the General Directors of each Genco during the transition period.
- to provide legal advise and assistance in establishing a corporate charter and organizing for corporatization.
- to establish an accounting structure that will allow the Gencos to account for and develop financial statements in accordance with International Accounting Standards (IAS) and National Electricity Regulatory Commission (NERC) regulatory standards, while simultaneously maintaining compliance with statutory Ukrainian accounting and reporting requirements.
- to design a financial management and accounting system that will capture data in a format to effectively manage the Gencos and provide an effective cost accounting and cost center structure.

The current Ukrainian accounting structure does not allow the collection of data in a format that supports cost accounting and financial reporting for a competitive environment. It is designed strictly to support tax reporting to the state. Producing financial statements, meeting new regulatory requirements and collecting and analyzing cost data is not effectively possible under the current structure.

B. Financial Management System Definition

A key to the success of the newly formed energy companies in Ukraine will be the ability of the people to effectively manage these entities in the newly created competitive market environment. PW has determined that this will in fact be critical to the success of these companies. Coming from an environment where all funding for plant expansion and operation came from the state, Genco management is now faced with the challenge of raising capital through public sources such as EBRD and World Bank, and from private investors. As these companies compete with other investment opportunities throughout the world, investors will be scrutinizing the company and its management to determine what the risk and opportunity is for investment. Such things as strategic and business planning, financial planning, accounting principles and practices, financial strategies for securing capital, and corporate financial policies will be closely watched on an ongoing basis and will be barometers for success of the companies.

The ability to meet these requirements drives the need for a well defined and properly designed financial management and accounting system. A sound financial management system will need to be developed which assists the companies in managing operations in an effective manner. This is achieved through a system which monitors activities, provides control over assets, accumulates financial and operating data and prepares financial and operating reports for evaluating current and future operations.

Meeting the requirements of external parties such as investors will require that these companies prepare financial statements in accordance with International Accounting Standards (IAS). This financial information is in addition to the financial information that is currently required for statutory reporting purposes. There will also be an increased demand for more data and information for regulatory requirements and to make the types of management decisions that will be required for effective internal management. The financial management system needs to be designed to comply with these financial statement and information requirements in a manner which makes best use of automated functions and eliminates any need to keep multiple sets of accounting records for different basis' of accounting.

C. Functional Design Methodology

This document identifies the relationship between business activities and computer systems, addressing the functional capabilities within those systems that will be required to support specific business activities (see volume II). This planning process is a critical first step to designing the information systems architecture that the companies will need in order to effectively operate as market driven, profit oriented enterprises. This approach assures that the systems are developed in order to support the necessary business activities

of the company. Any other approach cannot assure that the requirements of the business are defining the information systems design as opposed to the systems defining the business processes.

The accounting system will be a component of the financial management system and should be fully integrated with all other components. In response to the changing needs of management resulting from the newly created competitive environment, the accounting system will have to have expanded capabilities which are best executed by an automated system.

D. Information Systems Development Issues

Before proceeding with the implementation of any computer applications for the newly formed Gencos, consideration must be given to several architecture, design and implementation decisions which will need to be made. The following list of issues will need to be addressed in the context of cost and the ultimate direction that the Gencos wish to take in terms of information systems management and support effort.

- Which development platform will be used ?
- Which hardware configuration will be used ?
- What language do they use ?
- Will they use application generator tools ?
- Do they use a local database manager or a database server?
- What level of security needs to be provided ?
- Will hardware and software platforms be standardized ?

E. Financial Management System - Options

Several approaches to implementing a new Financial Management and Accounting System for the Gencos were evaluated during the process of developing the most practical strategy. Each of these options is identified in Chart 1, which follows, along with the pros and cons to the option and a cost estimate.

Chart 1

Financial Management System Development Options

OPTIONS	DESCRIPTION	PRO'S	CON'S	COST PER GENCO	TIME FRAME
Manual System	Financial information manually aggregated and formatted according to IAS standards.	No expense other than training for new accounting standards.	Only basic information recorded. Most necessary information would not be available.	\$100,000 for training. \$10,000 annual cost for additional personnel.	2 months
Outsource	Have systems maintained by outside vendor.	Low up-front cost. Short, easier implementation.	Availability of vendor. High on-going cost. Less control.	\$400,000 implementation. \$300,000 annual operating cost.	4 to 8 months
Develop system in-house	Develop systems using company personnel and contractors.	High degree of functionality. Capable staff for maintenance.	Lack of qualified development staff. Long development time frame. High cost.	\$2,000,000 implementation. \$200,000 annual operating cost.	2 years +
Purchase fully integrated system	Purchase fully integrated, high functionality software packages.	Full accounting plus financial management. Total integration among plants and headquarters.	High up-front cost. Long development time-frame. More difficult training process.	\$3,000,000 implementation. \$300,000 annual operating cost.	1 year +
Purchase near term solution	Purchase lower functionality package and focus on accounting.	Lower up-front cost than fully integrated system. Shorter installation time.	Some functionality lost. Will most likely need to upgrade in a few years.	\$1,200,000 implementation. \$120,000 annual operating cost.	6 to 8 months

PW has already developed an account classification that will allow the Gencos to collect the necessary accounting data in a format appropriate for producing all necessary financial statements and management information. PW has also expanded on the Ukrainian chart of accounts to allow compliance with IAS. These accounting standards should be applied to a new financial management system. This work is contained in Volume III.

F. Recommendations

Giving consideration to cost, availability of funds, the stage of development the companies are in and the extent of training that will be required to fully implement the accounting structure and practices that will need to be in place in order to effectively operate, the following actions are recommended as a way to move forward at an appropriate pace and still have constructive results.

- Select a software package which provides a high capability, fully integrated financial management system, but implement modules of the system on a staggered basis starting with the most critical areas needed, such as accounting and materials management. Later, other modules of the fully integrated system would be implemented as practicable.
- Install the software package on a "prototype" basis.
- Once the prototype is deemed appropriate for the other plants a "cookie cutter" approach can be followed for the remainder of the installations.
- Evaluate the option of a training exchange program with United States utilities through United States Energy Association (USEA) in order to have well qualified financial and accounting personnel from the Gencos come to the U. S. utilities for training.
- Utilize the financial forecasting model developed by PW to produce Balance Sheets, Income Statements, and Cash Flow Statements for each of the power plants and Gencos. This model is shown in Volume IV. It will serve as an excellent training tool, and will show the current financial status of each of the plants.

In the long-run, following this strategy should be a prudent investment. It will allow the Gencos to move up the learning curve utilizing a hands-on approach and at the same time give them an effective management tool to use to survive and grow through the privatization process.

I. OPTIONS AND RECOMMENDATIONS

A. Introduction

1. Background

The former structure of Ukraine's power sector consisted of eight regional production power associations, each providing service to oblasts and engaged in electric power and heat generation, transmission, and distribution to final consumers. Electricity generation and consumption were not balanced throughout the country and regions were connected by a common high voltage transmission system. The National Dispatch Center carried out the control and operation management of the entire system.

As a result of an extensive investigation carried out by Minenergo (the Ministry of Power and Electrification of Ukraine) and the Ministry of Economy, it was determined that it would be impossible to create an efficiently operating market for electric power within the context of the existing energy sector structure because of the lack of competition between generators and the existence of a large number of power sector agencies with different responsibilities and varying levels of profitability.

A strategy for the market transformation of the power sector of Ukraine was developed and implementation began with the issuance of Presidential Decree No. 244, "Market Transformation Measures in the Power Sector of Ukraine," on May 21, 1994. In December, 1994 the National Electricity Regulatory Commission (NERC) was created as an independent public authority to represent public interest in the enforcement, issuance and amendment of licenses issued by the Ministry of Energy to retail electric suppliers. Steps were also taken to break up the formally vertically integrated structure of the Ukraine energy sector headed by the Ministry of Energy. Six joint stock generating companies were created, consisting of two hydroelectric companies and four fossil generating companies (Gencos). Nuclear generating power plants are being excluded, for the moment, from privatization reforms. The National Electric Company (NEC) was created as a state enterprise to own and operate Ukraine's high voltage electricity transmission network. An Energomarket was created as a state enterprise responsible for the operation of the wholesale electricity market, the dispatch centers, central dispatch and settlement systems operation for those participating in the wholesale electricity market. Twenty-seven (27) local electric companies (LECs) were created to distribute and sell electricity to consumers.

The Energomarket will establish the wholesale price for electricity based on daily bids developed from generating stations' unit costs that are submitted by nuclear power plants, hydroelectric power plants, and thermoelectric power plants. While the wholesale price

will be a natural price determined by the pool, retail prices for consumers will reflect the pool price with additional costs for transmission and distribution costs.

The results of this reform effort are designed to ultimately:

- increase the efficiency of power generation which will promote competitive prices for electric power
- attract domestic and foreign investors
- create the financial condition to revamp the power industry and promote state-of-the-art technologies

The Ukrainian government has agreed to introduce a system largely inspired by a model successfully introduced in the United Kingdom in 1990. This is the first former Soviet bloc country to embark on such a radical scheme.

The initial cost of reforming the industry is being financed by a consortium of international donors including World Bank, USAID, EBRD, the British Know How Fund, the Swiss and Dutch Governments and the European Union. Funds in excess of \$50 million have been committed since October 1994 when the reforms actually began. Additional financing is already being negotiated.

2. Scope

Price Waterhouse LLP (PW) is a subcontractor on this project to USAID through the firm Hagler Bailly Consulting, Inc. PW's budget of \$1.8 million covers the fees of a team of 10 experts from October 1994 to approximately October 1995. In Ukraine, PW is currently advising the newly formed Gencos. PW was involved in the initial corporatization process and the subsequent commercialization advice. A senior advisor has been assigned to each Genco to assist the General Directors during the transitional period. A team of technical specialists focusing on operational issues, accounting structure, financial management, information systems and legal matters are advising all four Gencos on these respective issues.

3. Objectives

The four Gencos are expected to ultimately become economically viable and independent entities which operate in a competitive market environment.

The general objectives for this phase of the project are:

- to advise and assist the General Directors of each Genco during the transition period

- to provide legal advice and assistance in establishing a corporate charter and organizing for Corporatization
- to establish an accounting structure that will allow the Gencos to account for and develop financial statements in accordance with International Accounting Standards (IAS), while simultaneously maintaining compliance with statutory Ukrainian accounting and reporting requirements
- design a financial management and accounting system that will support the Genco's efforts in managing their corporate strategy and business plan, corporate financing, financial reporting and investor relations functions.

The more specific objectives of this phase of the project as they relate to 3.3.2 of the work plan are:

- establish a chart of accounts based on internationally accepted accounting principals
- design an accounting classification that will capture data in a format to effectively manage the new companies and provide an effective cost accounting and cost center structure
- prepare an accounting manual
- develop a model utilizing sample data inputs to produce financial statements which will be required by the Gencos
- identify and design the systems required to meet the financial and operating needs of the new companies
- define the functional requirements that will be supported with the proposed systems designs
- recommend a system implementation plan and define the implementation priorities
- prepare a paper addressing transfer pricing and profit center recommendations.

B. Financial Management System Definition

A key to the success of the newly formed energy companies in Ukraine will be the ability of their management to effectively lead these entities in the newly created competitive market environment. It will in fact be critical to the success of these companies. Coming from an environment where all funding for plant expansion and operation came from the state, Genco management is now faced with the challenge of raising capital through the public and private markets. As these companies compete with other investment opportunities throughout the world, investors will be scrutinizing the company and its management to determine what the risk and opportunity is for investment. Such factors as strategic and business planning, financial planning, accounting principles and practices, financial strategies for securing capital, and corporate financial policies will be closely watched on an ongoing basis and will be barometers for success of the companies.

The ability to meet these requirements drives the need for a well defined and properly designed financial management and accounting system. A sound financial management system will need to be developed which assists the companies in managing operations in an effective manner. This is achieved through a system which monitors activities, provides control over assets, accumulates financial and operating data and prepares financial and operating reports for evaluating current and future operations. Such a system will need to be fully integrated so that all corporate data is available to all users requiring access to this data in order to have the necessary information to make management decisions. The data should be in a data base management environment allowing for one time entry of the data and the maximization of data integrity. This will be the most economical way to manage corporate data over time. With the volume of data that will be required and which will exist, having the data in a data base environment will allow activities to be performed which would not be technically or economically feasible in a manual environment.

A financial management systems is responsible for satisfying both internal and external demands. Internal requirements include the accumulation of operational and accounting data, preparation of reports summarizing activities, strategic planning and other management demands. The financial management system should maintain a system of internal accounting controls which provide reasonable assurance that company policies and procedures are complied with, assets are safeguarded, and transactions are executed with appropriate authorization and recorded in a manner which permits management to meet its responsibility for the preparation of financial statements. External requirements include the preparation of financial statements and other information for government agencies, investors, creditors and other third parties.

External parties will require that these companies prepare financial statements in accordance with International Accounting Standards. This financial information is in addition to that currently required for Ukrainian statutory reporting purposes. There will also be an increased demand for more data and information in order to make the types of management decisions that will be required in order to effectively manage these new companies. The financial management system should be designed to comply with these financial statement and information requirements in a manner which makes best use of automated functions and eliminates any need to keep multiple sets of accounting records for different basis' of accounting.

C. Functional Design Methodology

The following functional systems design is a planning tool which will help to establish and maintain communications among users of business systems, all levels of management, and the information systems functions. The plan is the first step in the design of computer systems which will produce information for management purposes on a timely basis. Such computer systems will enhance the Genco's ability to achieve the objectives of profitability and accountability while at the same time improving productivity. Volume II contains the detailed information systems functional design and the related functional design definitions of the proposed financial management system.

This document identifies the relationship between business activities and computer systems, addressing the functional capabilities within those systems that will be required to support specific business activities. Business activities can be defined as "what" is done in the organization that is necessary to complete corporate functions. Activities have an identifiable beginning and a result when complete. Business activities are grouped into logical networks within major corporate functions which support the business goals and objectives of the company. A functional capability is the automated support of a user activity. These capabilities are defined during the analysis of the user activities.

The planning process began by identifying those business activities that are currently carried out by the companies and that will continue to be carried out as they evolve into independent corporations. This was then enhanced with business activities that the companies will be required to carry out in the future but that have not been a part of past business practices. Business activities were then compiled into logical functional groupings that could be supported by a computer system. After all activities to be supported by a computer system are analyzed, the total system design requirements can be documented for planning purposes. All systems contain a specific and unique functional capability for each activity to be supported by the system.

Many functional capabilities are logically related due to common system design requirements such as input, output, processing actions or data base information. Logically related functional capabilities are combined into subsystems and systems. A total information system is the sum of all of its functional capabilities. Multiple systems relating to a common subject are combined into system groups.

This planning process is a critical first step to designing the information systems architecture that the companies will need in order to effectively operate as market driven, profit oriented enterprises. This approach assures that the systems are developed in order to support the necessary business activities of the company. Any other approach cannot assure that the requirements of the business are defining the information systems design as

opposed to the systems defining the business processes. Following this plan will not only assure that the business processes are driving the systems development efforts, but it will also help the company to identify those activities that are not yet supported by computerization, thus allowing them to keep their systems development efforts properly focused.

The planning process focuses on business activities of the company and is not organizationally driven. This means that the plan is not tied to organization and does not have to be re-done every time the organization changes, which is likely to be quite often over the next few years as the companies expand and become more familiar with their new operating environment and business requirements. The only time that the plan would need to be re-visited is when the company changes its business in a way that new or different business activities are required.

The accounting system will be a component of the financial management system and should be fully integrated with all other components. In response to the changing needs of management resulting from the newly created competitive environment, the accounting system will have to have expanded capabilities which are best executed by an automated system.

Consistent with the above comments, in planning the functions of the accounting system, it is essential to identify the relevant requirements related to accounting data retrieval and applications of such data. New accounting and reporting requirements that are developing include: the accumulation of financial information and preparation of financial statements and reports under two basis of accounting, as discussed above; there are needs for dual currency reporting which the accounting system will have to incorporate for the preparation of financial information based on a hard currency; operating reports should be tailored to the needs of management and should be prepared by the financial management system by retrieving information from the accounting system and other components; preparation of financial and operating reports on a departmental basis to better monitor activities; and other newly evolving requirements. Such information is most valuable to management when it is prepared on a timely basis.

D. Information Systems Development Issues

Before proceeding with the implementation of any computer applications for the newly formed Gencos, consideration must be given to several architecture, design and implementation decisions which will need to be made. The cost of hardware, software and development effort is high, but even higher is the cost of productivity and lost competitiveness if an organization fails to fulfill its purpose. One could simply select a package and let it drive many of the following issues, but a more strategic approach could save a lot of time and money in the long run. After all, a financial management system is a production system which will handle high volumes of corporate data and, if properly designed, will be operational for a long period of time to support important corporate functionality.

The following list of issues will need to be addressed in the context of cost and the ultimate direction that the Gencos wish to take in terms of information systems management and support effort.

- Which development platform will be used ?
This is a question of support and cost. Most software today can run in both a Windows environment or under DOS or OS\2. To stay a generation behind in both software and hardware can save money, but does not put you with the latest technology. The Gencos must decide which platform they are prepared to support and if they want to work with a tried and tested environment or try to step up to the latest technology.
- Which hardware configuration will be used ?
The Gencos will be working with large applications and high volumes of Corporate data. They will need to determine whether they want to use large mainframe computers or PC network configurations with a client server to manage data base files. Because of physical locations of the plants and the headquarters, they will need to have network connectivity with either approach. This again will be an issue of cost and what they are prepared to support.
- What language do they use ?
Even the best packages do not handle every possible situation so the Gencos will be writing code from time to time. Whether they have an internal development team or use contractors, they will want to be sure that the proper level of trained support is available for enhancements and maintenance.

- Will they use application generator tools ?
Modelers, designers, builders and other rapid application development tools are common and readily available on the market today. They can select to use such tools to the maximum or they can mostly write code. There are costs and benefits to both approaches and a thorough evaluation of these options would be a good strategy at some point in time.
- Do they use a local database manager or a database server?
The simplicity of using a products internal database manager cannot be discarded lightly, but there are clear benefits that a client server database manager can offer, particularly when applications become distributed and interfacing becomes important.
- What level of security needs to be provided ?
These are for the most part widely distributed applications creating and maintaining corporate data with the requirement for a high degree of data integrity. Who has the right to view this data and who has the right to update it are security issues that should be addressed up front.
- Will hardware and software platforms be standardized ?
The Gencos have at the present time an opportunity to start from a clean base point with the development of hardware and software platforms. Setting standards for the growth and development of these platforms now can save significant money in the long run. Being faced with a mixed platform environment will most likely complicate the effort and increase the expense of any future growth and development.

These are all issues that are outside the scope and objectives for this phase of the Ukraine electric energy sector project. However, addressing these issues and developing a strategy for them prior to beginning the implementation of major corporate systems will not only help to assure the success of these systems, but will also establish sound information systems strategies which will save the Gencos money and time in the long run. These issues are therefore addressed at this time in the hope and belief that they will become a part of an overall information systems plan for the Gencos.

It is of course possible to let a purchased package define the strategy for some of these issues, but to ignore the issues all together would not be in the companies best interest and would most certainly cause some major problems, and most likely increased expense, down the road. Building applications based on a well considered design philosophy and a solid, flexible architecture is the way to go.

E. Financial Management System - Structural Options

Several approaches to implementing a new Financial Management and Accounting System for the Gencos were evaluated during the process of developing the best possible strategy. Each of these options is identified here along with the pros and cons to the option.

A) Manual System

This approach would involve manually recording all accounting transactions according to the new system of accounts structure identified in this plan. Financial Statements and any other financial information that would be required in order to manage the company would have to be manually aggregated and formatted. Company personnel would need to be trained in the new accounting structure, and it is probable that more accounting related people would be needed throughout the company in order to maintain this manual system.

- Pro** There would be little to no expense to set up and maintain a manual system other than for training which will need to take place regardless of which approach is followed.
- Con** With the volume of data that will need to be maintained, a manual system is not a realistic option. Only basic information to develop financial statements would be feasible. Most business processes would not be able to be supported with a manual system and there would be very little information available to manage the business with.

B) Outsource Financial Systems Support for Accounting Functions

This approach would involve having an outside firm collect all corporate accounting data necessary to produce financial statements according to international accounting standards. The firm could also develop other financial information which might be used to manage the company, providing that information was defined and the necessary data was collected by the company and fed to the outside firm. Company personnel would still need to be trained in the new system of accounts structure so that they could collect the appropriate data to deliver to the outside firm.

- Pro** The up-front cost to this approach could be reasonable compared with other automated system approaches. If a vendor is available to support this approach the implementation time frame could be shorter than other systems approaches.
- Con** It is highly unlikely that a vendor exists that is ready to support this functionality, thereby eliminating the benefit of a short time frame for implementation. Because a financial management system manages critical

corporate data, this is not the type of system that is typically outsourced. Corporate management usually wants to have control and ready access to all their accounting and financial data. While the up-front cost to this approach could be attractive, this would be a more costly approach in the long-run, as on-going operating cost would be high compared with other options.

C) Develop a Financial Management System Using In-house Staff.

This option would involve having company information systems personnel, or contract labor, develop an integrated financial management system using the functional design document detailed in this plan for general specifications. Detailed system specifications would be developed through interviews with accounting and financial personnel involved in the day-to-day activities of each function identified in the plan and modules would be developed to support these functions.

Pro Provided there is enough qualified staff in-house to develop a fully integrated financial management system in the proper systems environment, a high percentage, if not all, of the functional requirements defined in this plan could be met. This would also leave the Gencos with qualified and capable people to maintain the system after it is put into production. Because of the low labor costs in Ukraine, this might be a less expensive approach than purchasing a fully integrated package.

Con The time that it would take to develop a system in-house would, in all likelihood, be too long to respond to competitive situations and keep the Gencos solvent long enough to survive. In addition, if it took too long to develop the systems, then even with the low cost of labor in Ukraine, the cost could exceed that of purchasing a package. There is also the risk that if in-house programmers are not proficient with the technology used, the inefficiencies of the new system could drive operating costs up significantly.

D) Purchase a Fully Integrated Financial Management System Package

This would involve purchasing a "off-the-shelf" package which could support a majority of the functionality defined in this plan, and that could accommodate all the systems requirements of the Genco, both at present and for the long-term. Modules would then be developed to support that functionality which was not accommodated by the purchased software, and would provide a totally integrated system. Company financial and accounting personnel would be trained in the operation of the system and in the new accounting practices and procedures defined in this plan.

- Pro** Assuming that a system is available on the market to reasonably meet Genco requirements, this would be the most economical way to implement a fully integrated system, in a relatively short time-frame, that would satisfy those requirements. Such a system would most likely have built-in operating efficiencies and would be designed using current system technologies. Because it is a purchased package, technical support should be available during installation, and on-going maintenance support would also be available from any reliable vendor. This would be, in all likelihood, the quickest way to provide the Gencos with complete and accurate accounting and financial data with which to manage their business.
- Con** Purchasing such a system would require the largest up-front outlay of cash of any of the options evaluated. This approach would also involve a significant training effort, all at one time, for both the new system operation and the new accounting practices and procedures.

E) Purchase a Short-Term Systems Solution

This option would involve purchasing a software package with less capability than the fully integrated package defined in the previous option, but which could still support company business requirements for a short-term period of two to three years. Very often such products are more "user friendly" than the more sophisticated packages, with the trade-off being less flexibility, and more limitations.

- Pro** This type of software product can usually be purchase at a much lower cost than a fully integrated package as defined in the previous option, and the installation time can be much shorter. The lower price and shorter installation time can make it a very good tool to obtain quick system benefit and then step up to a more sophisticated system in an organized fashion after the user has gone through a learning curve on a less sophisticated, more user friendly system.
- Con** Some functionality will most likely be missing from this systems approach. Basic financial reporting needs would be met, but some information needed for strategic or management decisions would not be supported. System upgrades would be required for this functionality. There will be the additional cash outlay when the Gencos need to upgrade this software option to software with more capability. They will then incur the additional time and expense of a second installation effort.

F. Estimated System Cost Summary

The costs shown in the summary provided in chart 2, on the following page, are estimates only. A specific package and/or vendor would have to be identified before detailed time and cost schedules could be put together.

Training cost estimates assume a total of four training consultants to develop training courses and conduct training seminars. Regardless of which approach is followed to implement a financial management system, a significant amount of training will be required in order to prepare Genco personnel for recording costs under the newly defined accounting structure. Training efforts increase as the complexity of the financial information system increases.

Estimating the cost of outsourcing the financial management functions for the Gencos is very difficult because of the lack of qualified vendors to perform this service. This option would need to be researched carefully, and may not be a viable option because of the lack of qualified vendors. If a qualified vendor does exist, the cost may preclude being able to exercise this option.

The cost estimates for developing the financial management system in-house reflect the significant cost for consultant support because it was assumed that in-house personnel would lack the knowledge and expertise in the newly defined accounting standards that would allow them to be fully functional as systems development experts for this particular application. In addition, Genco personnel costs reflect the lower pay scale compared with American and European scales. Genco personnel time is only included in the in-house development option as this approach will require significant staff and programming time to implement this approach.

Both the fully integrated option and the near-term option assume that packages are available that are supported in Russian. These estimates reflect the cost to design, development and implement all phases of the system, and include consultants for training, development, training classes, systems design and systems development.

In the case of the near-term option it should be emphasized that some functionality will be missing from this approach and therefore will require additional in-house development to make the system complete. Only after a specific package is identified can we determine how much of the defined functionality would be met by the package.

Again, costs stated in this summary are only estimates and a specific package and/or vendor would need to be identified before a detailed time and cost schedule could be put together.

Chart 2

**Financial Management System Options
Cost Summary**

(In \$U.S. Per Genco)

	Manual System	Outsource	Develop In-House	Fully-Integrated System	Near-Term Solution
Hardware	N/A	N/A	400,000	300,000	225,000
Software	N/A	N/A	N/A	900,000	450,000
Training	130,000	100,000	200,000	300,000	165,000
Consultant Implementation	N/A	240,000	1,300,000	960,000	185,000
Expenses	20,000	60,000	N/A	340,000	130,000
Personnel	N/A	N/A	100,000	N/A	N/A
Contingency	N/A	N/A	N/A	200,000	95,000
Total	\$ 150,000	\$ 400,000	\$ 2,000,000	\$ 3,000,000	\$ 1,250,000

G. Financial Management System Implementation Recommendations

This overall systems design can be viewed as a road map of how to achieve the computerized environment that the companies will need in order to operate effectively. The implementation of such a complex systems structure can be a very long and expensive process. It is important to consider the most cost effective approach to the implementation strategy. It is also important that the companies achieve some of the automated functionality as soon as possible in order to help them to properly manage their businesses and remain commercially viable in the short-term. Consideration was given to the following factors in developing these implementation recommendations:

- The stage of development the companies are in and the extent of training that will be required to fully implement the accounting structure and practices that will need to be in place in order to effectively operate.
- The cost of a fully integrated systems architecture such as the one defined in this plan and the availability of funds for the companies to implement such a structure.
- The criticality of having accurate cost information as soon as possible in order to effectively compete in the bidding process for selling their product.

1) Considering these factors it is recommended that as much of the systems architecture as possible be purchased packages as opposed to developing the software with in-house or contract support. Only those systems which cannot be purchased on the market should be developed from origin. This approach should significantly reduce the amount of lead time to obtain operational software which will begin supporting the business processes. Any increase in cost for such an approach should be more than offset by the time savings realized in exercising this strategy. (Buying usually costs less, but because of the low labor costs in Ukraine, it may actually be cheaper to develop a system.)

The functional design plan presented in this document will serve as the tool to determine how much of the functional requirements of a system can be met by any package which is evaluated. A rule-of-thumb should be that if the package can meet approximately 80% of the functional requirements, then it would be a good candidate for implementation, providing it meets all other hardware and software compatibility requirements. It then has to be decided how the remaining 20% of the requirements can be met and what the consequences are if they are not met. If there are too many changes to be made to the original package, then the cost will start to rise significantly, along with the risk that implementation problems will outweigh the benefits of making the changes.

2) It is also recommended that the Gencos assess the hardware and systems software environment in which they wish to operate and are prepared to support. IBM or IBM compatible environments will most likely provide the greatest flexibility and accommodate the widest range of options for software applications. A DOS or Windows system software environment will also accommodate a wide range of options. The system software assessment should also consider a flexible data base management system with a true relational data base architecture. Such a system should be able to bring files in from a wide range of software environments.

3) English is becoming the international computer language and it would be wise to keep this in mind when making software selections. Doing the translation to another language via computer is a good idealistic goal, but realistically it is not as easy as one might think it should be. Therefore being able to support software written in English, or purchasing software that is already translated to Russian or Ukrainian would definitely be a wise strategy to follow.

4) There will be a strong need for training in order to carry out the other recommendations in this plan, so it is recommended that a emphasis and priority be put on training company personnel in both the information systems area and the accounting and financial areas. There will be significant changes in these areas and the success of the Gencos depends on the ability of the people to navigate this transition and be able to understand and manage the new procedures and responsibilities they will incur. Training is the key to this success, and it, in itself will need to be well administered. Group training as well as individual hands-on training will be the best combination to bring people through this transition quickly. The best systems on the market today will be of very little value if the people do not understand the systems and use them. The accounting and financial people have to learn a whole new accounting structure and policies, and will then need to be able to utilize this data to create valuable information so that company management can make informed, intelligent decisions about the operation and the future of the company. This is a major undertaking that will determine the success of the Gencos, and it depends on adequate training to assure this success.

5) Functional requirements of the accounting system would include the following points:

- a. The system must have the capability to maintain accounts and generate financial reports in accordance with statutory Ukrainian accounting standards.
- b. The system must have the capability to maintain accounts and generate financial reports in accordance with International Accounting Standards (IAS).

- c. Accounts must be identifiable as monetary assets, monetary liabilities and non-monetary accounts.
- d. The system must provide for an account coding system which allows for the classification of account balances and period activity in a functional reporting system. Such a system assigns designated codings to information as it is entered into the accounting records which classifies the data within certain groupings, such as divisions, profit centers, type of resource and project number. This creates the ability to prepare management reports which focus on various aspects of the business. The reports would be prepared by retrieving accounting information based on specific classifications within the account coding groupings (e.g., an operating report which lists all the revenues and expenses of a particular profit center).
- e. The system must have the capability to maintain multiple currencies (at least dual) reporting.
- f. It must be possible to identify the actual account balance of each currency.
- g. The system must be able to automatically translate transactions from one currency to another according to any of the following three cases:
 - transactions where the exchange rate from the date of the transaction should be used;
 - transactions where the exchange rate from an historic date prior to the date of the transaction should be used; and
 - transactions where the translation is based on a user-defined rate or not translated at all.
- h. IAS financial statements should be prepared as if all transactions were originally recorded and accumulated on the accounts in a stable (i.e., hard) currency.
- i. The system must be able to report all transactions using at least two currencies.
- j. The system should maintain a distinction between transactions carried out in one currency and converted to a reporting currency and transactions actually carried out in the reporting currency.

- k. The system should be capable of producing reports and financial statements where actual currency and translated currencies are combined.
- l. The system should allow for multiple exchange rates to be used (e.g. official, actual).
- m. The system should be able to revalue monetary assets and monetary obligation accounts and automatically calculate foreign currency gains and/or losses.
- n. Foreign currency gains and/or losses should be calculated separately for monetary asset and monetary liability accounts.
- o. The system should be able to calculate the gain/loss on the purchase/sale of foreign currencies automatically.
- p. The system must have the capability to group accounts and sub-accounts in any combination to meet different reporting requirements.
- q. The system must have the capability to report the same accounts for some reports as Income Statement items and for other reports as Balance Sheet items.
- r. The system must allow for an extensive number of accounts and sub-accounts.
- s. The system should allow for the revaluation of accounts and maintenance of historical value information.

H. Near Term Recommendations

Because of the amount of transition that the Gencos need to go through and the financial restrictions that they are faced with, the following short term actions are recommended as a way to move forward at an appropriate pace and still have constructive results.

- Select a software package which is inexpensive compared to a high capability, fully integrated financial management system, but will quickly provide the basic functionality required by the Gencos for the short term. PW has worked with various off-the-shelf software packages in similar environments and is aware of products which are supported in Russian and could satisfactorily meet the requirements that the Gencos currently have.
- Install the software package on a "prototype" basis; that is to install and develop the system for one Genco plant. After the system has been successfully installed and debugged, evaluate its usefulness and only then decide if it should be installed at the other plants. If so, then the experience from the prototype installation should make the remaining installations quicker and smoother. After all plants have an operational system, then they can be "networked" so that there is more interface and consolidation capability.
- Evaluate the option of a training exchange program with United States utilities through United States Energy Association (USEA) in order to have well qualified financial and accounting personnel from the Gencos come to the U. S. utilities for training. This training should focus on capital budgeting and financial planning, accounting principals and practices, strategies for securing debt and equity financing, and corporate financial policies.
- Utilize the short term system solution to move the Gencos forward at a pace that will work for privatization, one which is not too fast but which is still moving forward and helping them to remain viable. The system will also serve as an on-line tool for training financial and accounting personnel in the new international accounting standards and accounting structures which they need to learn quickly.
- Utilize the financial forecasting model developed by PW to produce Balance Sheets, Income Statements, and Cash Flow Statements for each of the power plants and Gencos. This would involve manually pulling together the accounting and financial information in the appropriate format

and entering the data into the model. Besides being an excellent training exercise, it will show the current financial status of each of the plants and produce the various financial ratios that the investment community uses to evaluate companies when considering investment options. This will create the baseline from which the Gencos can gauge their growth and change in financial status as they progress through their privatization efforts.

In the long-run, following this strategy should be a prudent investment. It will allow the Gencos to move up the learning curve utilizing a hands-on approach and at the same time give them an effective management tool to use to survive and grow through the privatization process. In two to three years when these companies have outgrown this short-term systems approach, they will have established a sound accounting and financial base with which to operate in an open market economy. At this point they will be better prepared to apply more engineering than mechanics to the up front systems design for a new application. They will be able to take the time to apply wisdom previously gained to accommodate future needs. As previously stated and explained in this plan, building applications based on a well considered design philosophy and a solid flexible architecture is the way to go. Experience will give the Gencos the wisdom to build just such applications.

III. FUNCTIONAL DESIGN

A. Information Systems Functional Design

The Information Systems Functional Design illustrates the computer systems that will be necessary to support the business functions carried out in each generation company.

The systems that will be necessary include:

Management Accounting System

Employee Information System

Materials Management System

Fuel Management System

Maintenance Management System

Construction Management System

Each of these is described below:

MANAGEMENT ACCOUNTING SYSTEM

The Management Accounting System supports a broad range of business activities. Most of the source data for this computer system originates in other business systems throughout the company and is gathered into the accounting computer system. Various activities such as calculating costs, forecasting expenses, managing cash, processing payments, creating journal entries, and posting to ledgers are supported in Management Accounting.

EMPLOYEE INFORMATION SYSTEM

The Employee Information System collects and maintains data required to support payroll and personnel activities. There is a system to support each of these major business activities. They provide information to various parts of the Management Accounting System as well as support to the Maintenance Management and Construction Management Systems.

MATERIALS MANAGEMENT SYSTEM

The Materials Management System Group encompasses the total procurement, issue, and inventory control cycle. Interfaces are maintained with various parts of the Management Accounting, Construction Management, Maintenance Management and Fuel Management Systems.

FUEL MANAGEMENT SYSTEM

The Fuel Management System provides for the complete planning, procurement and control of fuel and its use. Interfaces are necessary with both the Management Accounting System and the Materials Management System.

MAINTENANCE MANAGEMENT SYSTEM

The Maintenance Management System supports the processes used in inspecting and maintaining the company's plant and equipment, specifically generation units. This includes the planning for, and scheduling of, both inspections and maintenance and replacement programs, as well as collecting maintenance history. Interfaces occur with the Management Accounting System, the Employee Information System and the Material e Management System.

CONSTRUCTION MANAGEMENT SYSTEM

The Construction Management System provides a tool for management to plan, schedule and monitor both major and short term construction projects. Power plant construction is the major emphasis of this system. Interfaces are necessary with the Management Accounting System, the Materials Management System, and the Employee Information System where assistance is provided for crew scheduling.

This approach allows for total integration of each system with other necessary systems in the company. This means that all data is entered into a database which is compatible with all other databases through a data manager. All data is edited and validated at the point of entry. From there any other system which needs to use that data will access the database for retrieval of the necessary data. This approach allows for one time creation and maintenance of all data and guarantees that all changes to data are processed correctly in order to maintain data integrity. This is the most economical and accurate way to capture and maintain all corporate data.

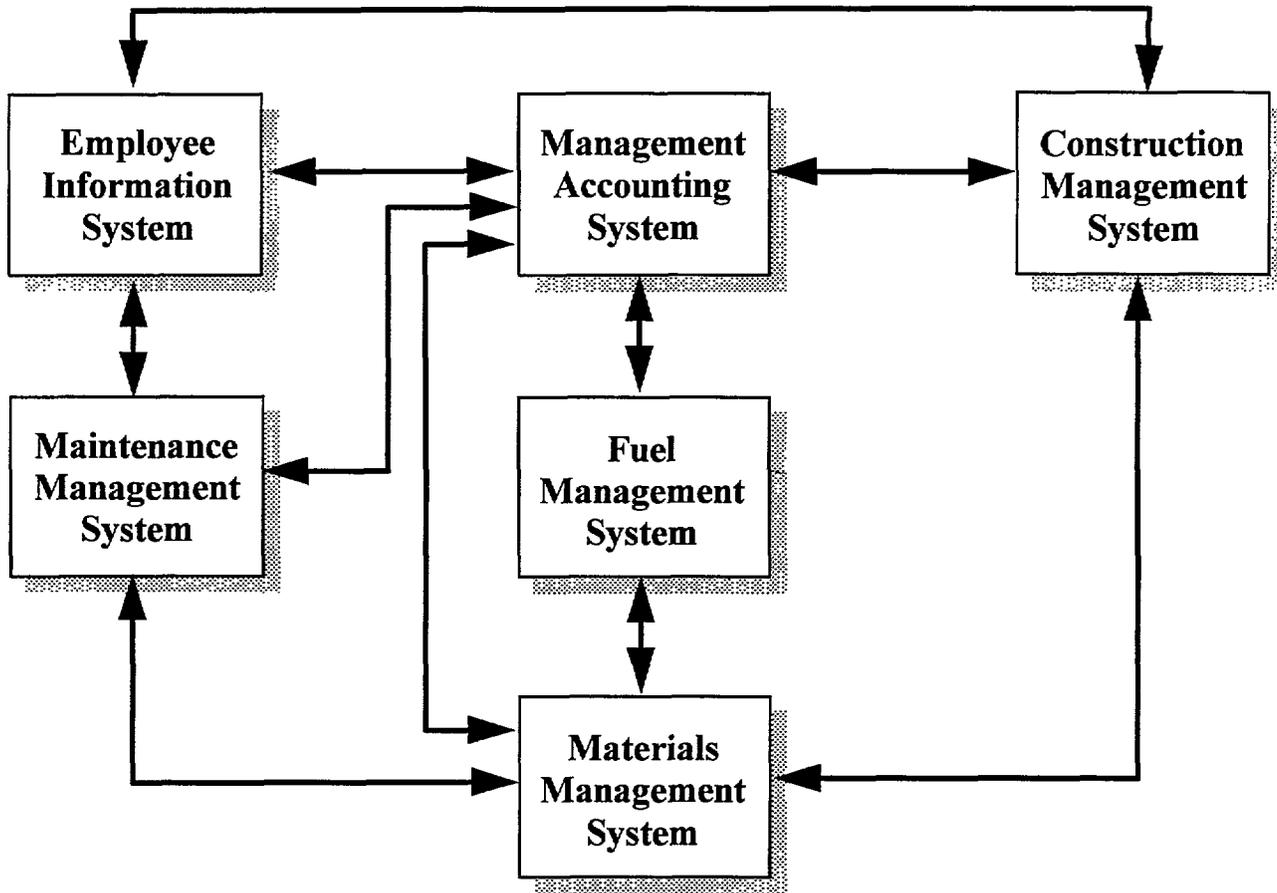
The emphasis for the development of functional specifications for the Ukraine Energy sector is on Accounting and Financial Management Systems and those systems which directly interface with these systems for the purpose of creating accounting and financial data and supporting the accounting functions of the company. The detail functional specifications cover Management Accounting, the payroll portion of Employee Information, Fuel Management and Materials Management. It does not cover either Maintenance Management

or Construction Management as these systems have far less direct impact on the accounting processes. These later systems are however a very important part of the overall systems requirements of the company. They will need to be developed at some point in order to have support for all company functions and to have a fully integrated corporate information systems architecture.

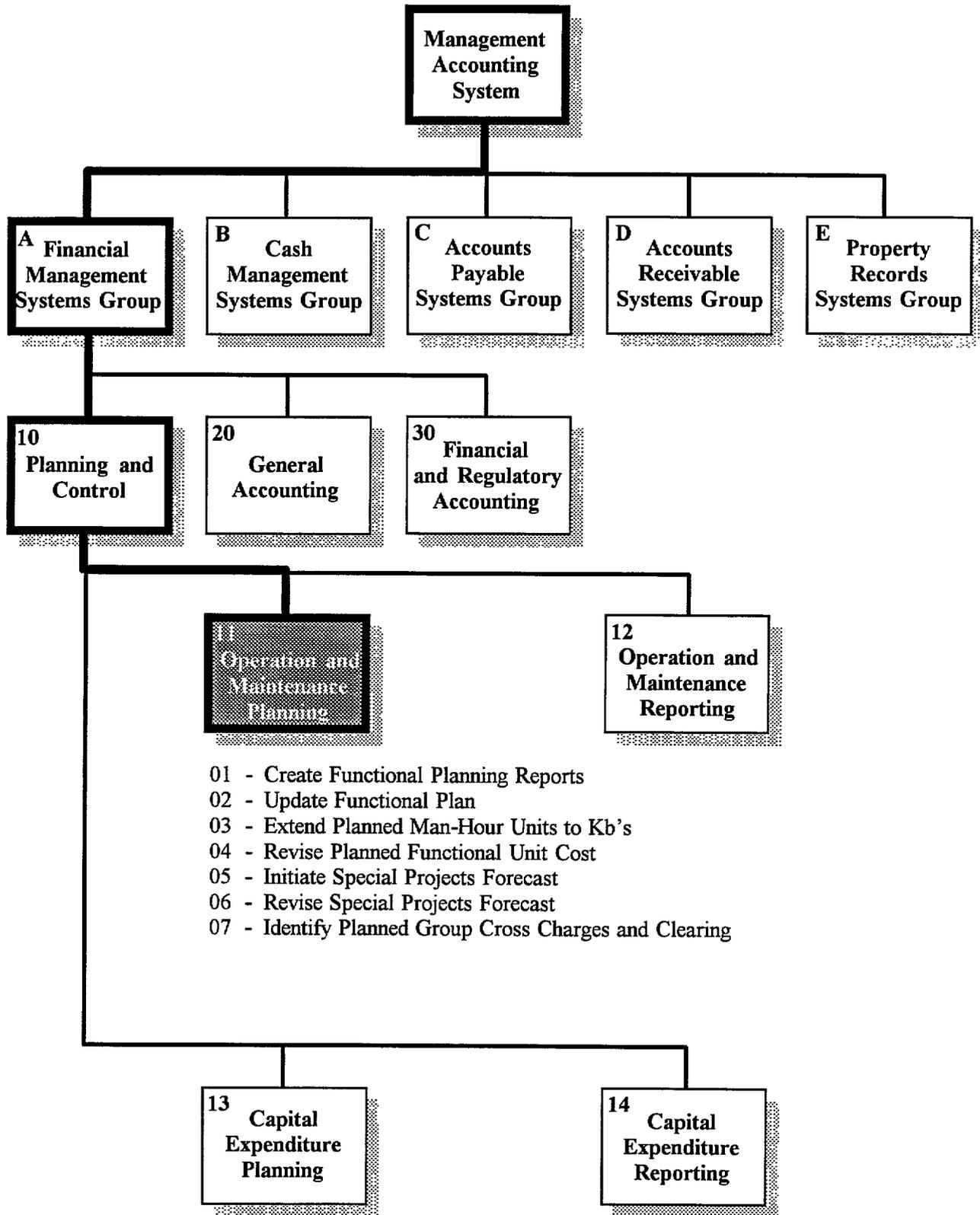


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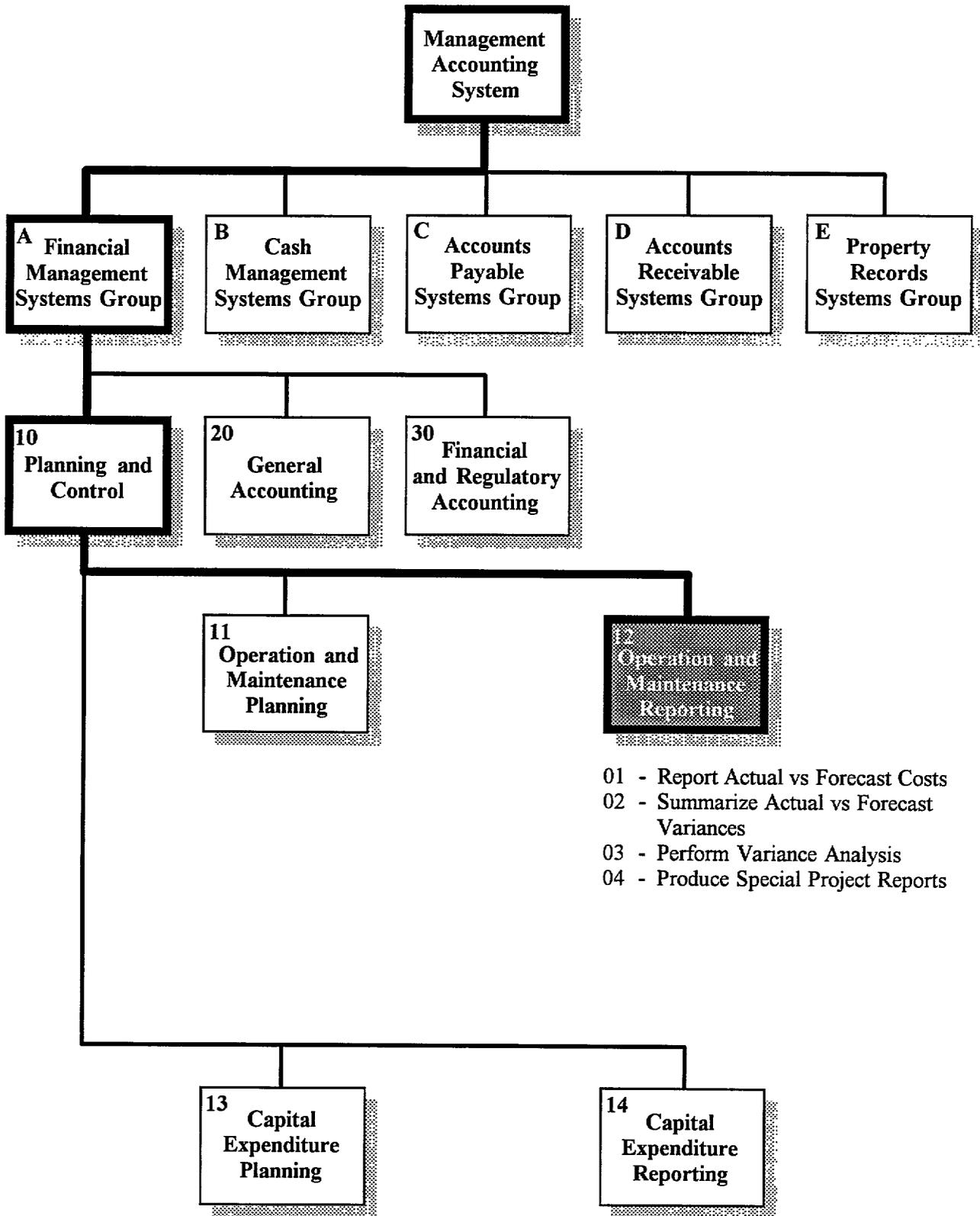
Information Systems Overview



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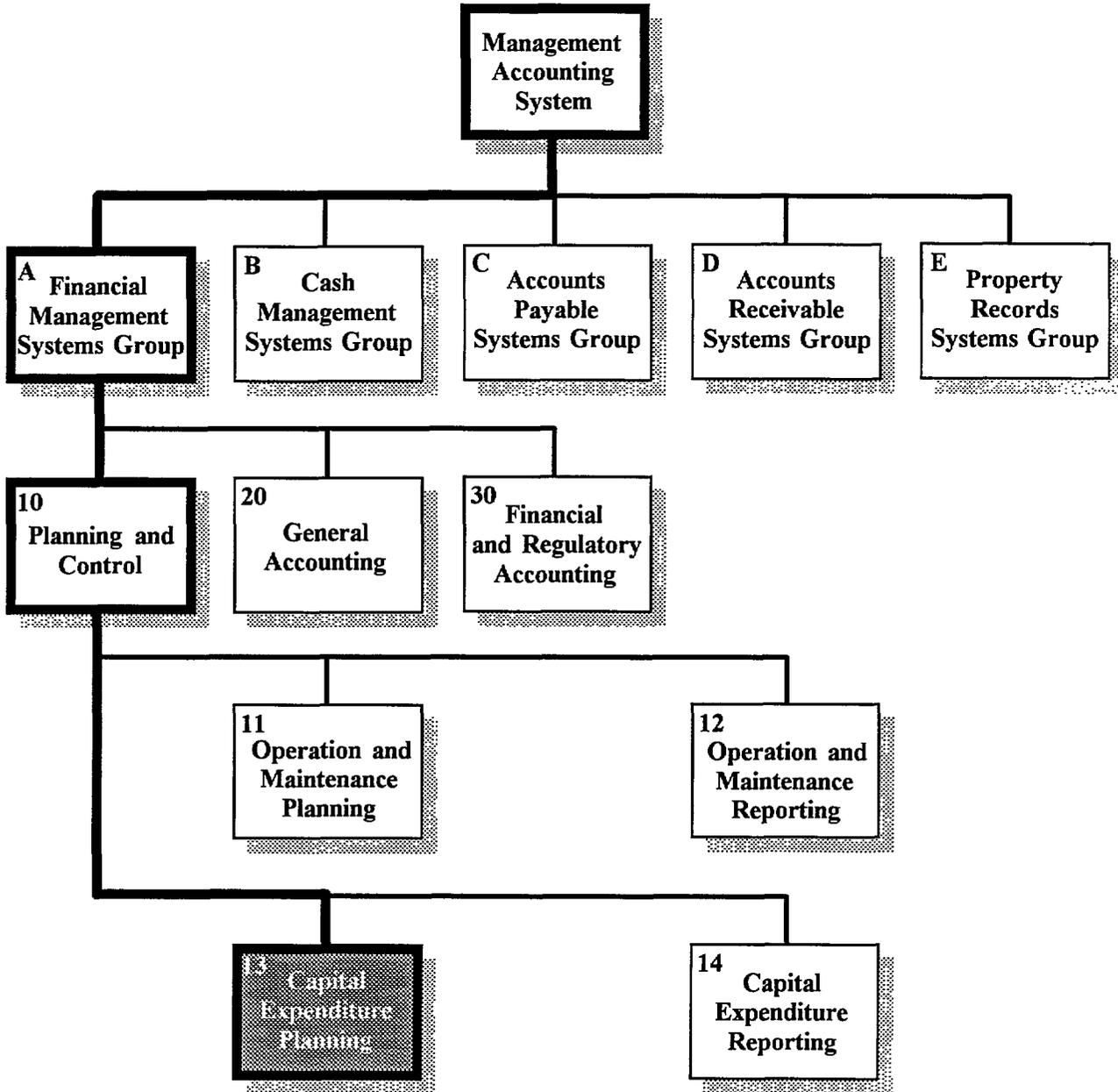


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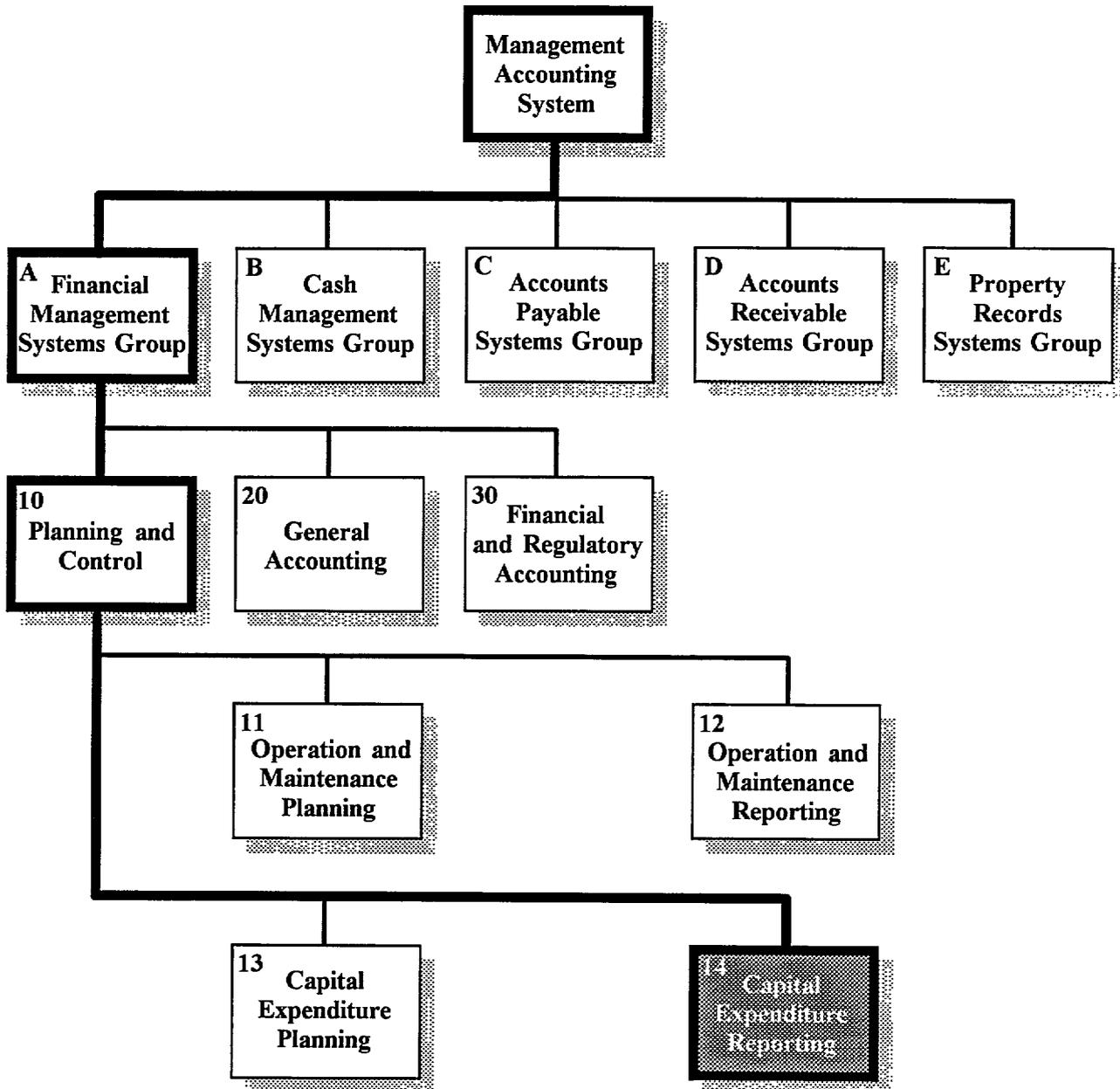
- 01 - Report Actual vs Forecast Costs
- 02 - Summarize Actual vs Forecast Variances
- 03 - Perform Variance Analysis
- 04 - Produce Special Project Reports

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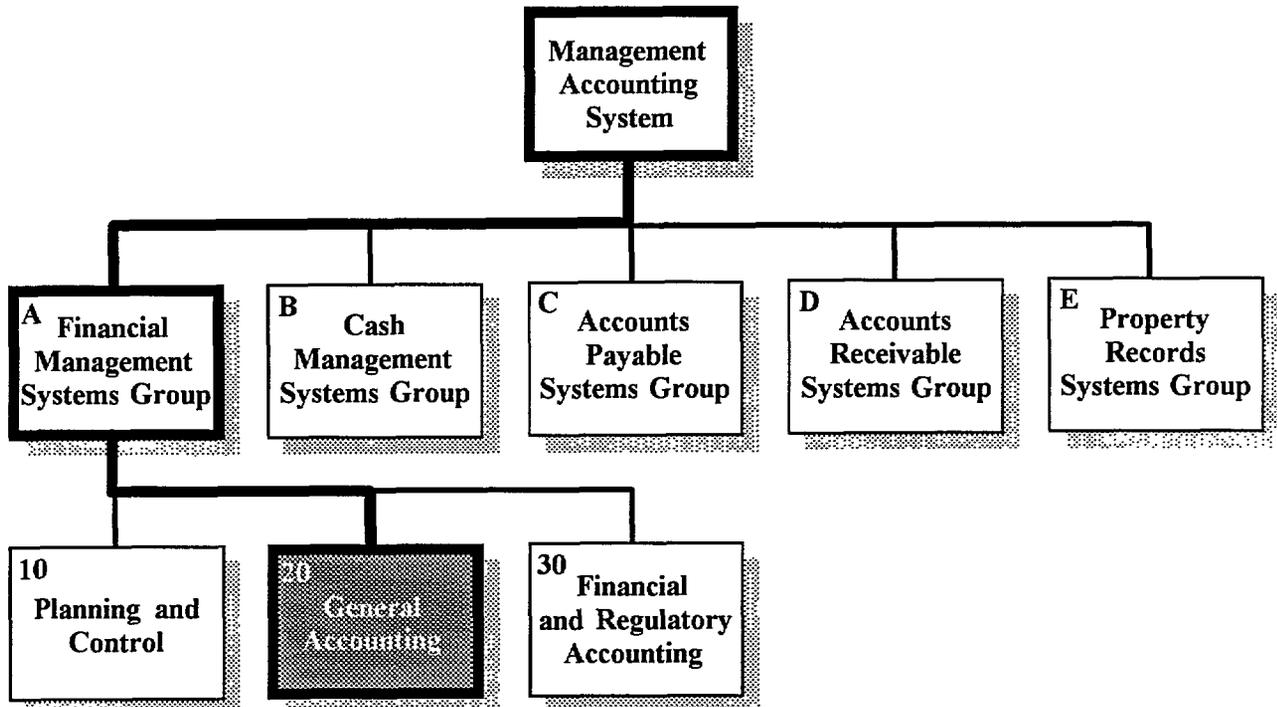
- 01 - Create Capital Planning Report
- 02 - Update Capital Expenditure Forecast
- 03 - Extend Capital Man-Hour Units to Kb's
- 04 - Produce Capital Expenditure Reports by Area, Group, Sub-Group, Category, Resource, etc.
- 05 - Revise Construction Budget for up to Date Costs

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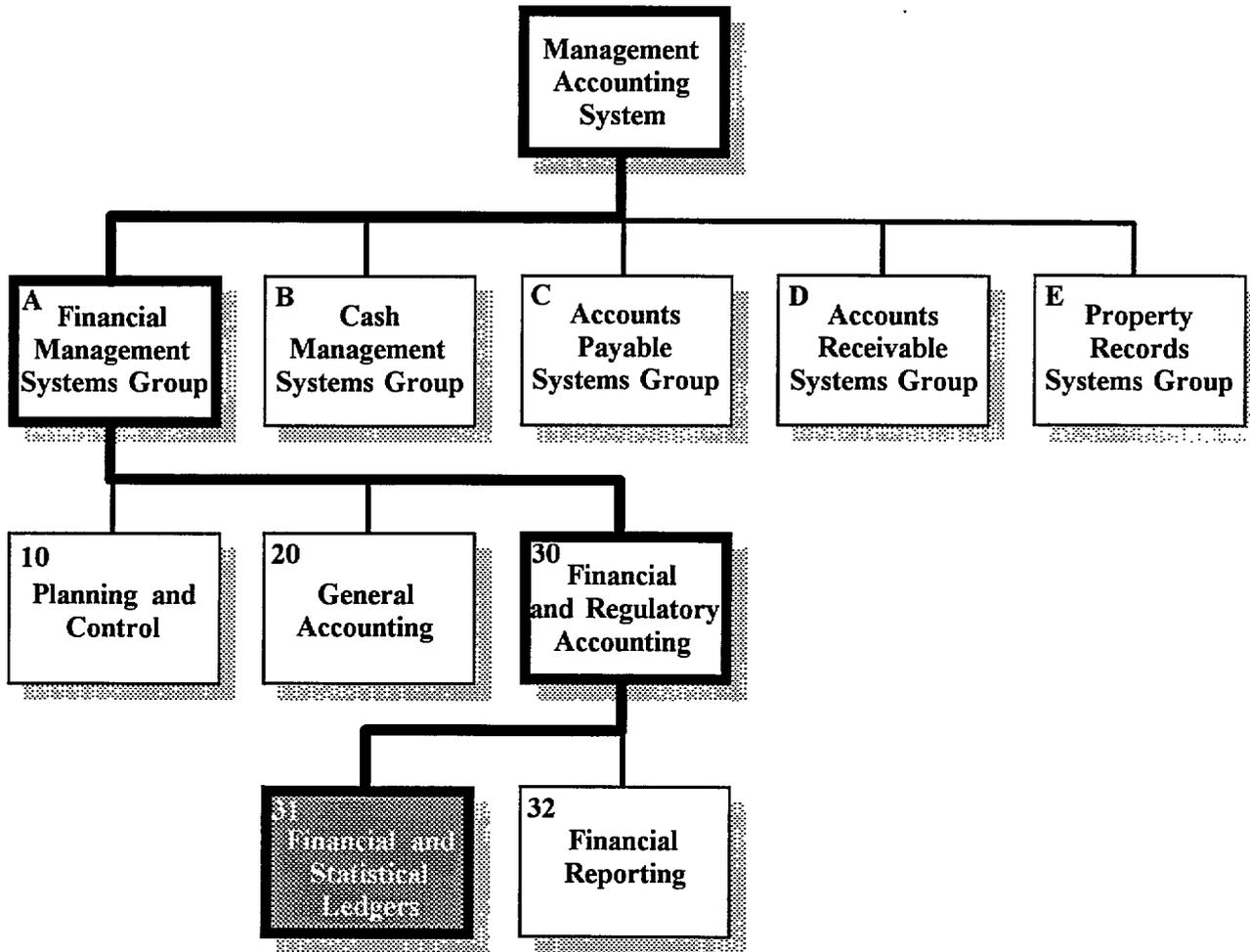
- 01 - Report Actual vs Forecast Construction Costs
- 02 - Summarize Actual vs Forecast Construction Variances
- 03 - Perform Capital Forecast Variance Analysis
- 04 - Produce Cost to Complete Report

Ukraine Energy



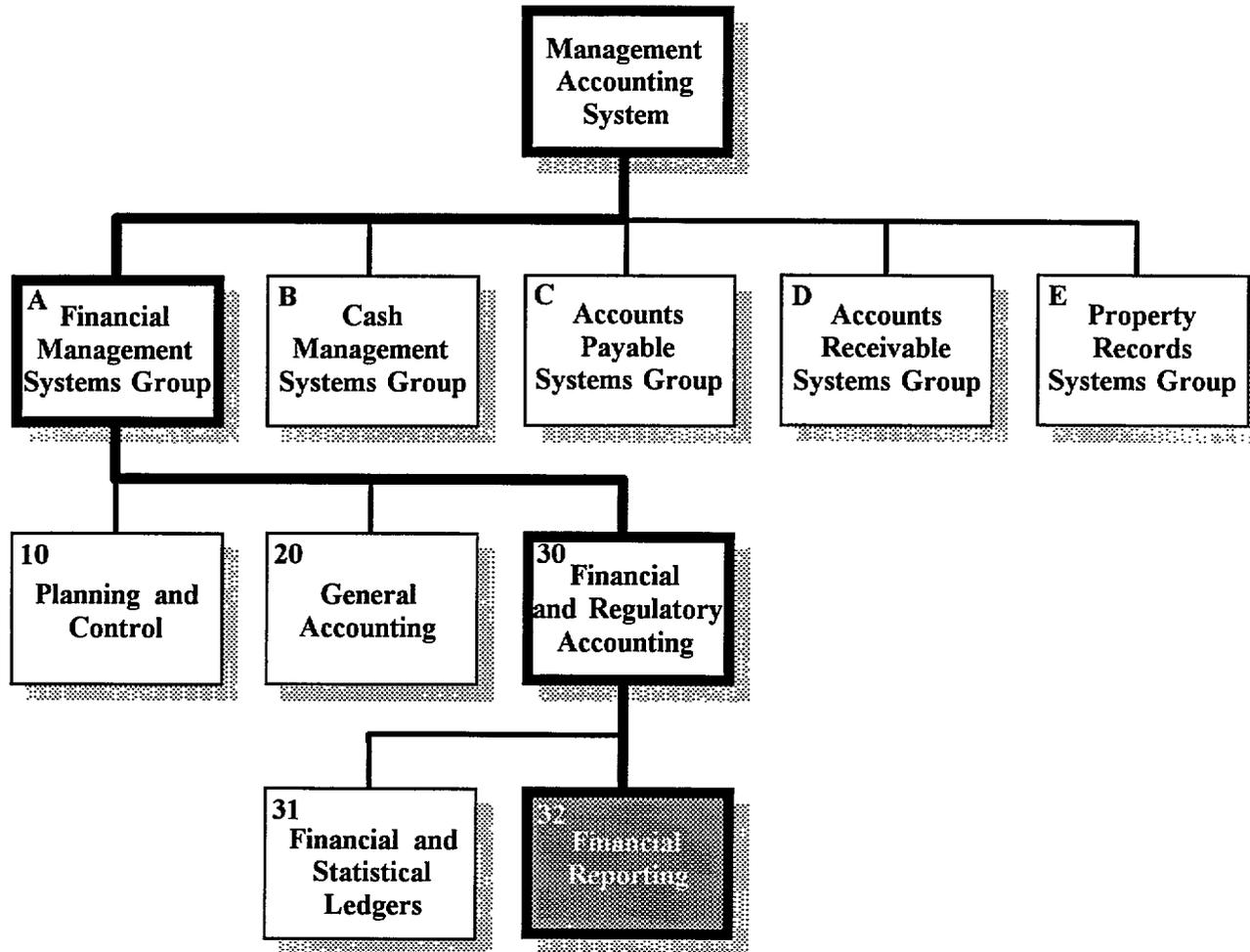
- 01 - Generate All Accounting Distributions
- 02 - Generate Recurring Manual Journal Entries
- 03 - Generate Journal and Cash Voucher Registers
- 04 - Distribute Administrative and General Expenses
- 05 - Allocate Common Expenses
- 06 - Calculate Stores Expense Clearing Rates
- 07 - Calculate Construction Overhead Clearing Rates
- 08 - Calculate Unallocated Payroll Clearing Rates
- 09 - Distribute Unallocated Payroll Charges
- 10 - Calculate Profit and Other Taxes
- 11 - Distribute Stores Expense
- 12 - Distribute Construction Overheads
- 13 - Generate Payroll Accruals and Reversals
- 14 - Unitize and Transfer Construction Work-In-Progress to Plant-In-Service
- 15 - Generate All Automated Journal Entries
- 16 - Generate Journal Entry Facing Pages for General Ledger
- 17 - Generate Offset Accounting System Detail Ledger Entries
- 18 - Generate Financial and Statistical Transaction Data
- 19 - Maintain Classification Data
- 20 - Record Ancillary Operations Expenses

Ukraine Energy



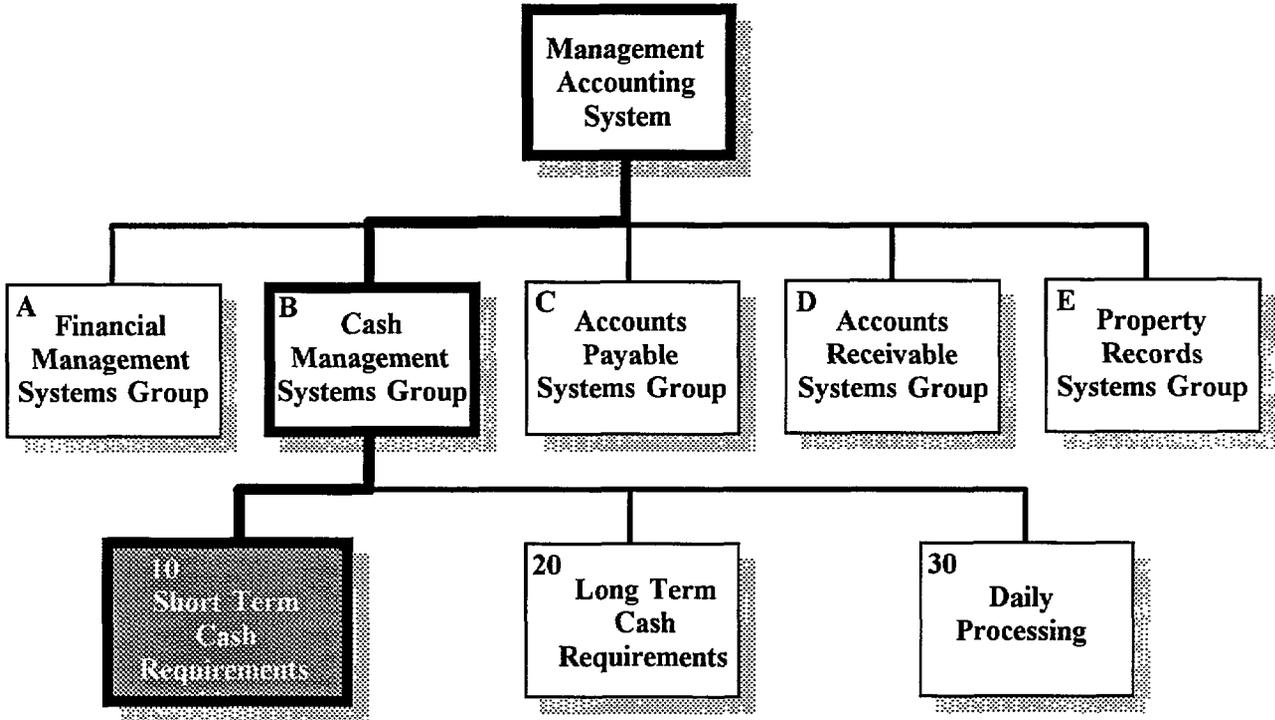
- 01 - Maintain Ledgers for Financial and Statistical History Information
- 02 - Maintain Ledgers for Financial and Statistical Information for Ancillary Operations
- 03 - Restate Financial & Statistical Data in Hard Currency
- 04 - Restate Financial & Statistical Data for Inflationary Adjustments

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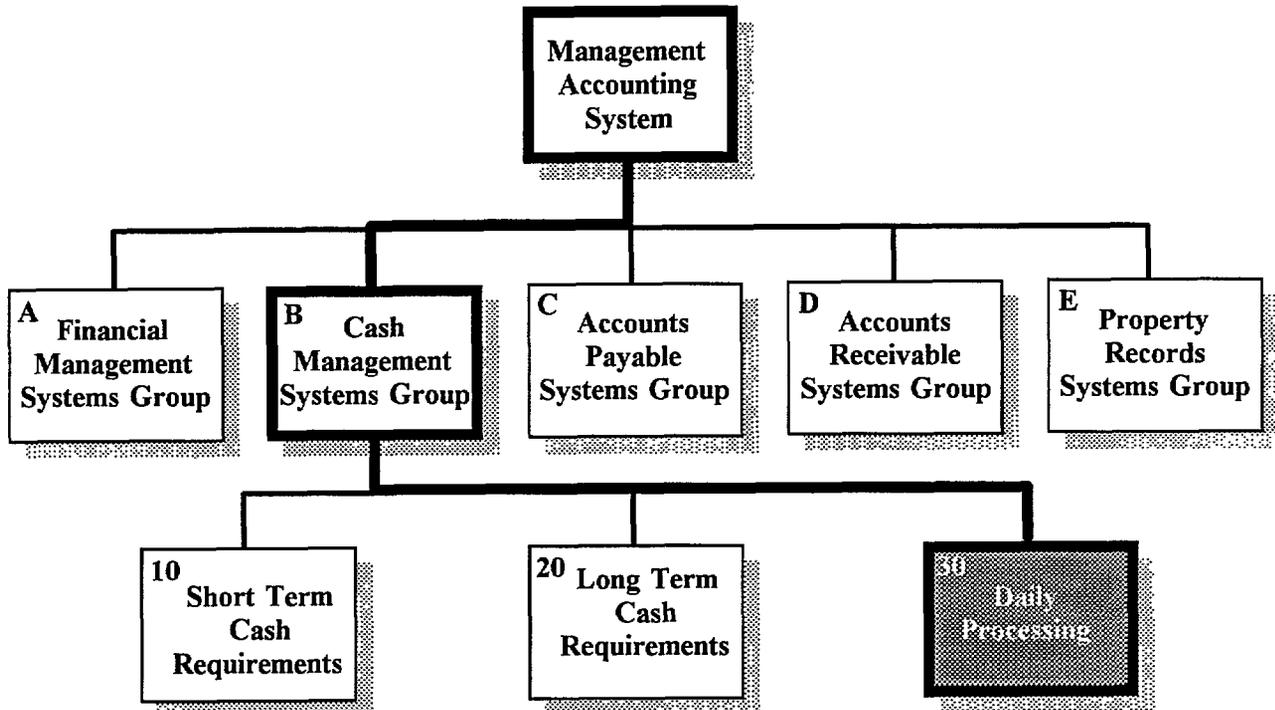
- 01 - Prepare Financial and Statistical Reports for Management
- 02 - Prepare Reports for Investors and Regulators
- 03 - Prepare Ledgers and Income Statements
- 04 - Prepare Ledgers and Statistical Reports for Ancillary Operations

Ukraine Energy



- 01 - Generate Projections of Daily Cash Receipts
- 02 - Determine Disbursements and Known Liabilities
- 03 - Generate Short Term Cash Requirements

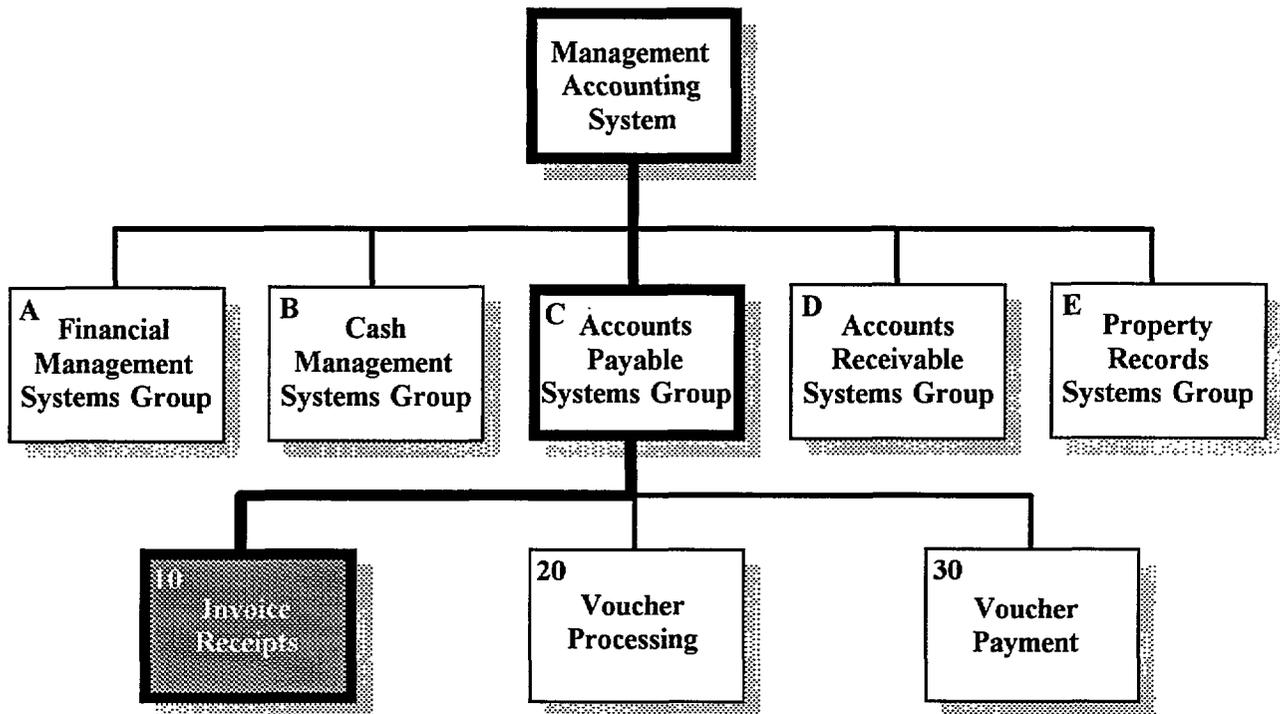
Ukraine Energy



- 01 - Record Cash Receipts
- 02 - Record Known Liabilities
- 03 - Record Cleared Checks
- 04 - Update Bank, Vendor, and Mail Floats
- 05 - Determine Bank Balance Requirements
- 06 - Monitor Cash Forecast to Actual Requirements
- 07 - Maintain Corporate Cash Books
- 08 - Generate Bank Transfer Requirements
- 09 - Prepare Bank Reconciliation
- 10 - Record Paid Liabilities

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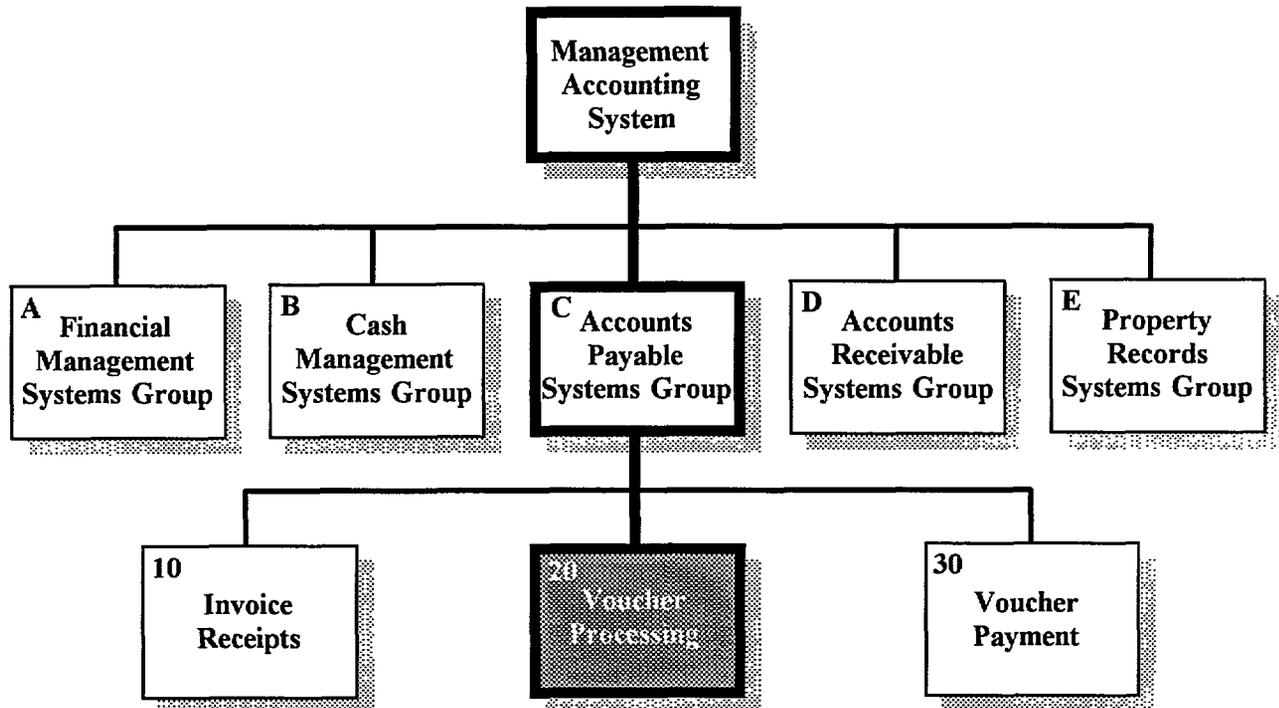
Ukraine Energy



- 01 - Establish Vendor Records
- 02 - Input Invoices
- 03 - Edit and Validate Invoices

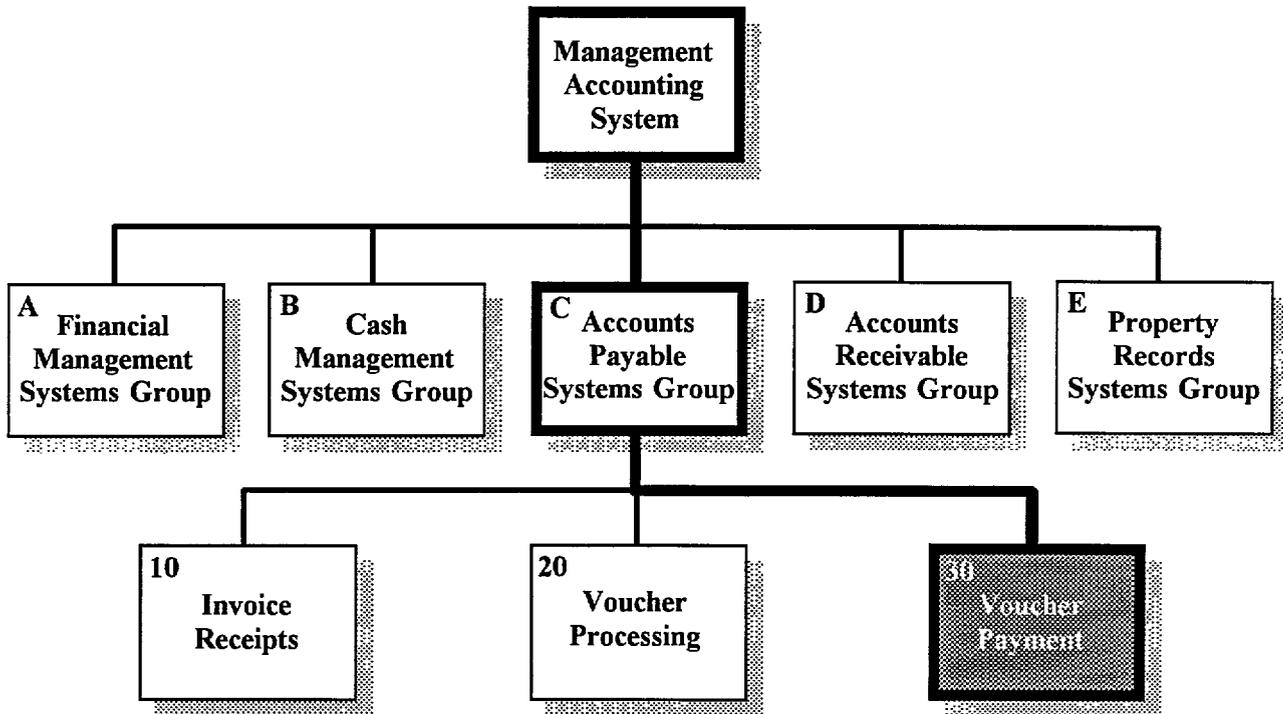
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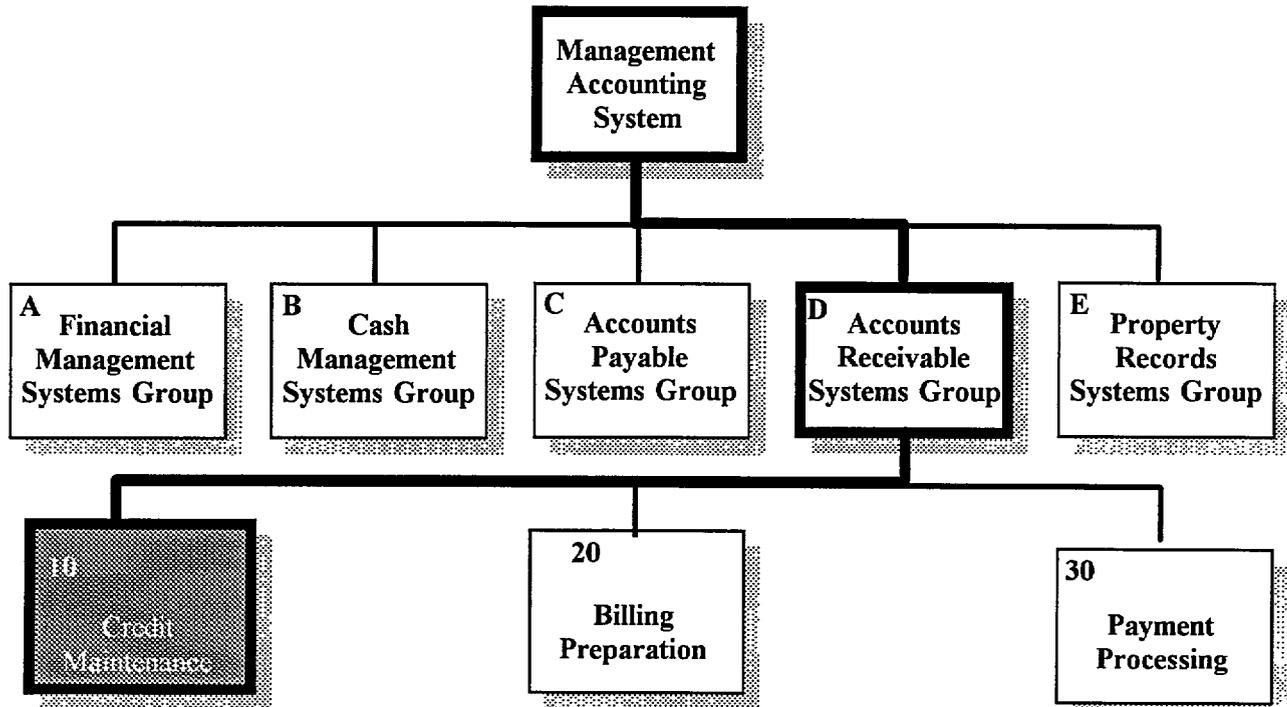
- 01 - Determine Payment Due Date
- 02 - Calculate Daily Disbursement Totals
- 03 - Match Vouchers to Material Receipts
- 04 - Maintain Aging Records
- 05 - Prepare Month-End Voucher and Vendor Reports
- 06 - Create Month-End Account Distribution Report for General Ledger
- 07 - Create Pre-Payment Voucher
- 08 - Process Barter Payable Settlement Transactions

Ukraine Energy



- 01 - Determine Pay Status
- 02 - Generate Bank Orders
- 03 - Generate Payment Analysis Report

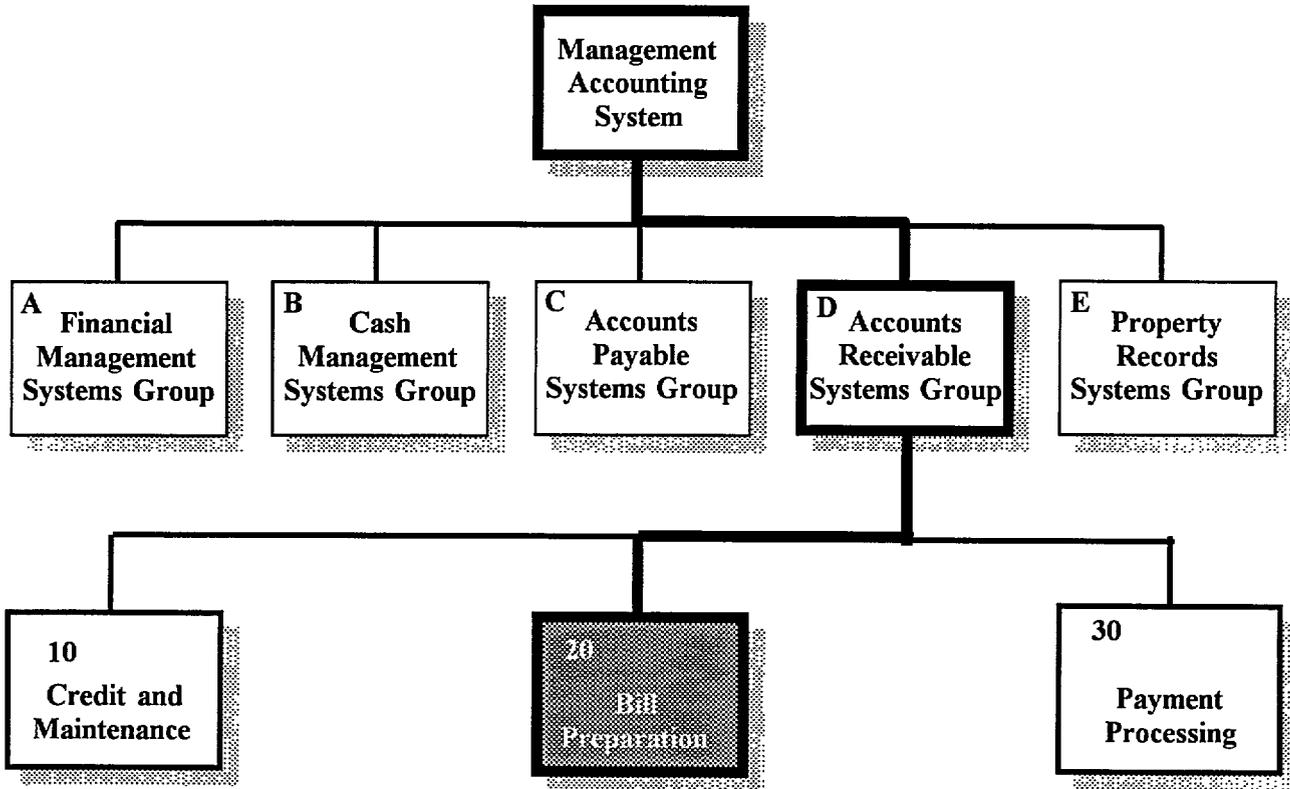
Ukraine Energy



- 01 - Monitor Accounts Receivable
- 02 - Maintain Data for Open Balance and Aged Accounts Receivable List
- 03 - Write off Uncollectible Accounts

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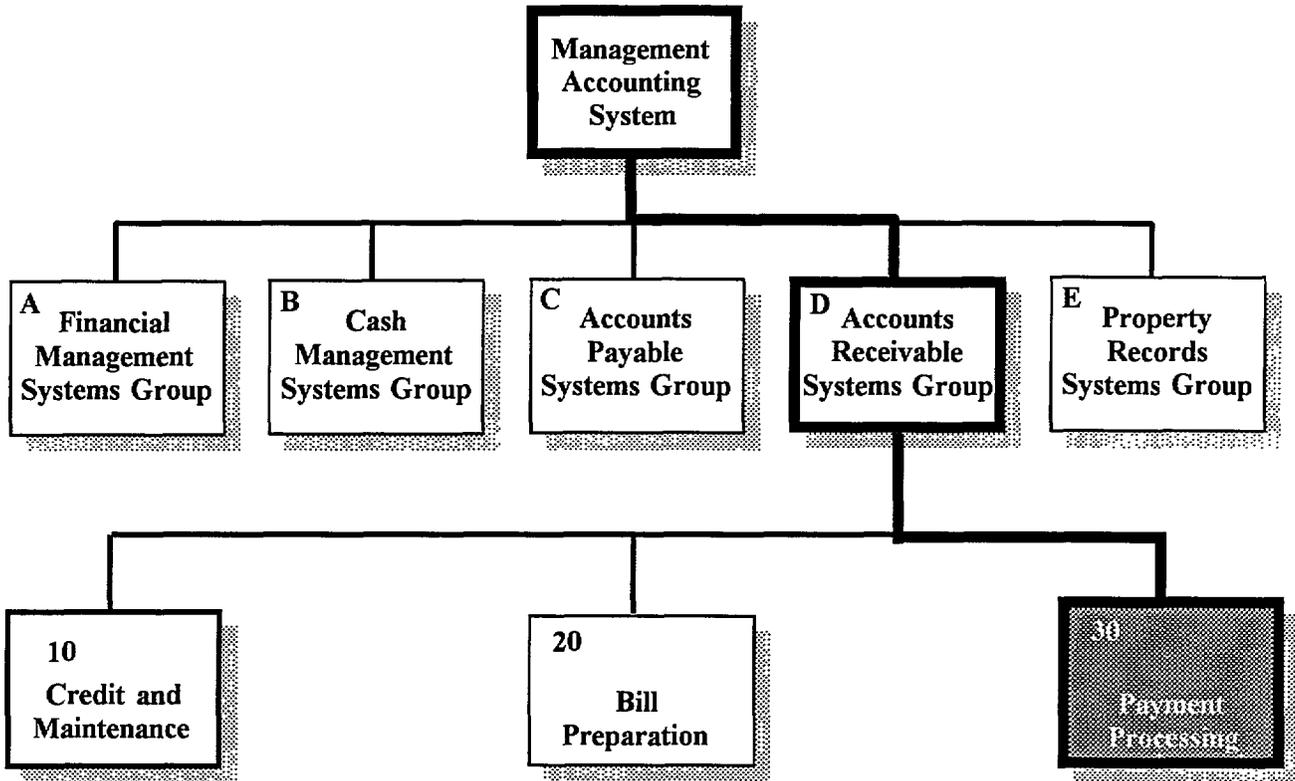
Ukraine Energy



- 01 - Calculate Current Bills
- 02 - Calculate All Other Charges
- 03 - Calculate Late Payment Charges
- 04 - Prepare Bills
- 05 - Print Reminder Messages
- 06 - Generate Revenue and Accounts Receivable Journal Entries for Accounting
- 07 - Late/Rebill Preparation
- 08 - Process Barter Receivables Settlement Transactions

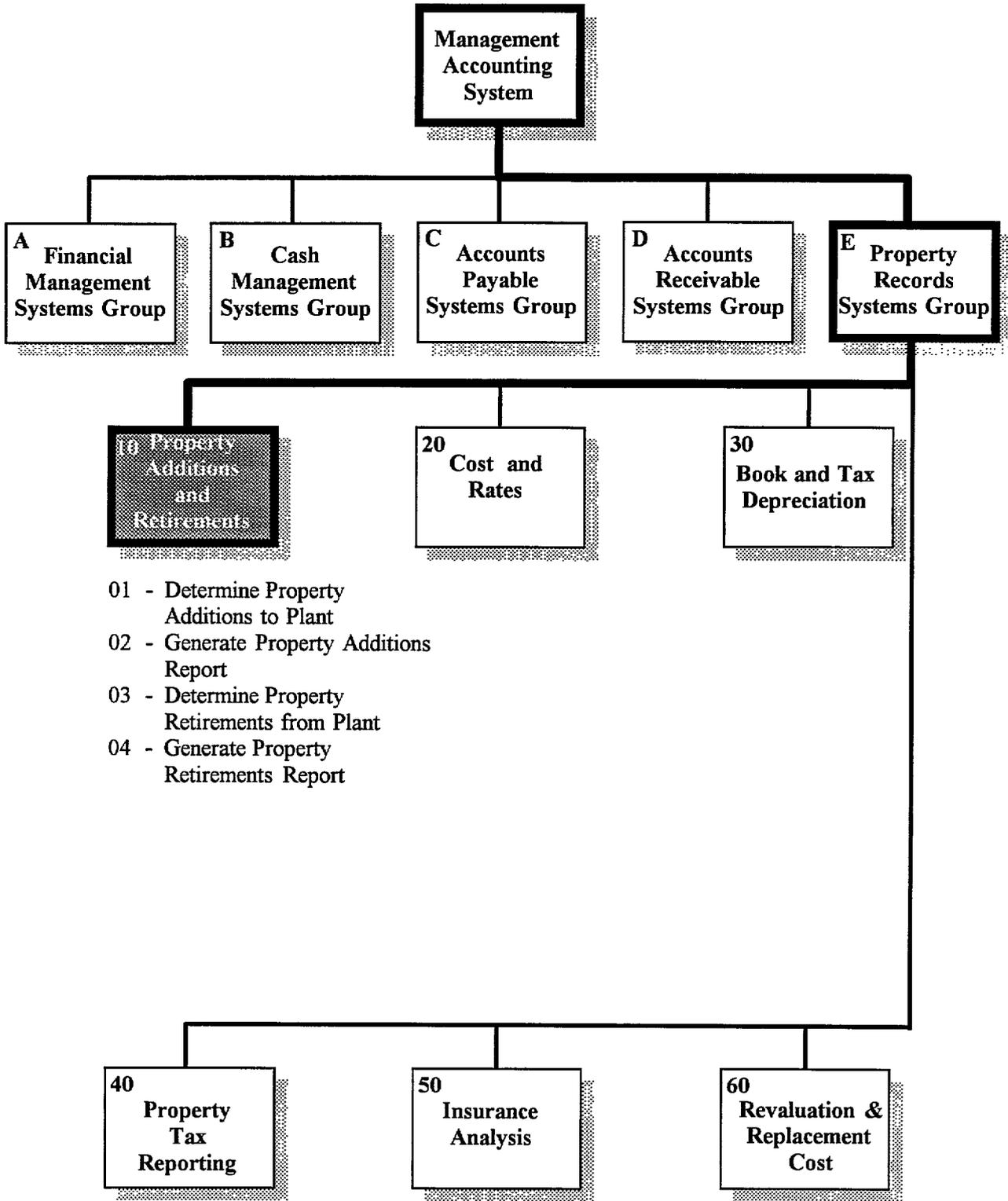
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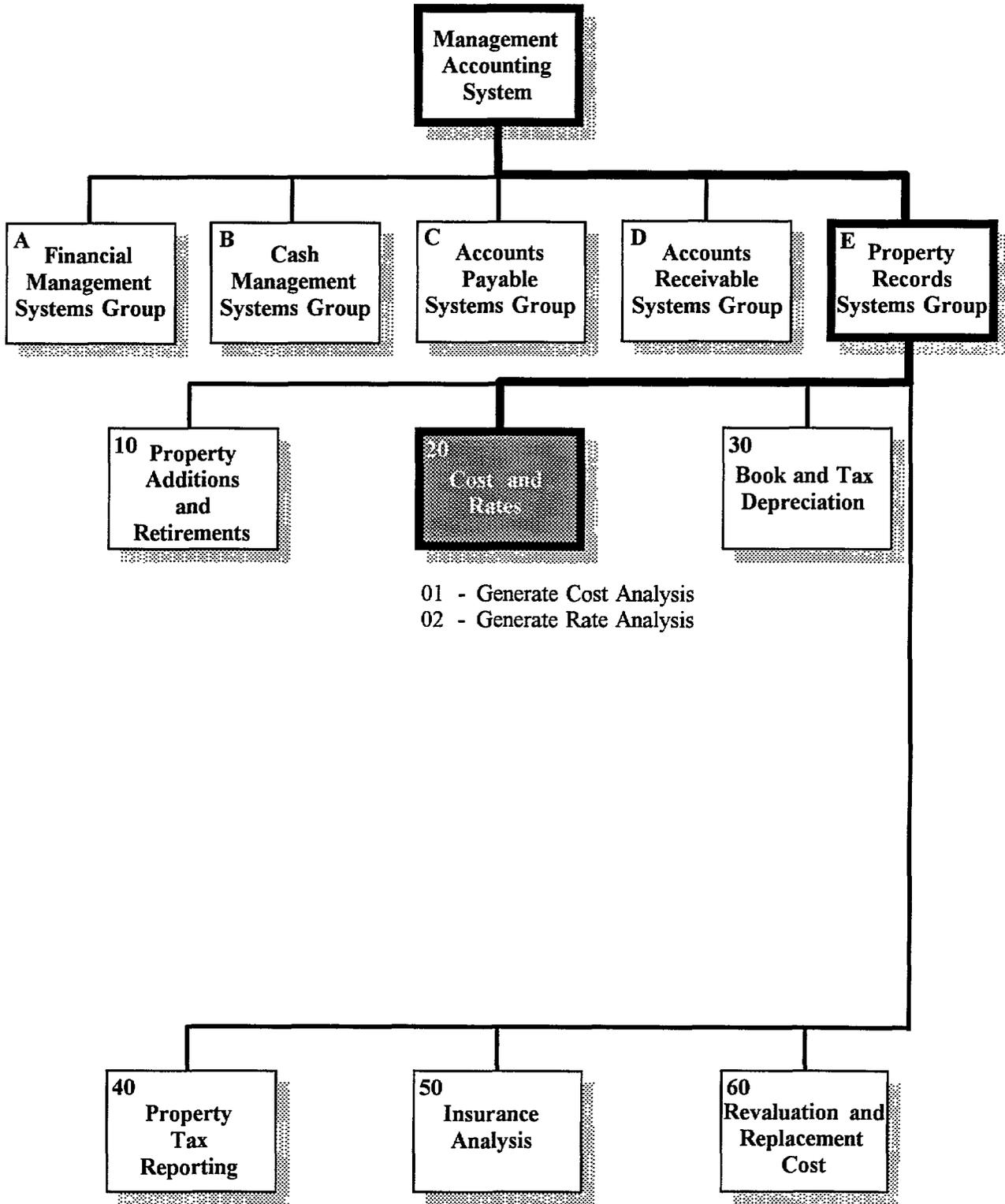


- 01 - Process Full Payments
- 02 - Process Partial Payments
- 03 - Provide No-Bill Records
- 04 - Post Payments to Written Off Accounts
- 05 - Post Unidentified Payments
- 06 - Post Bank Returned Checks

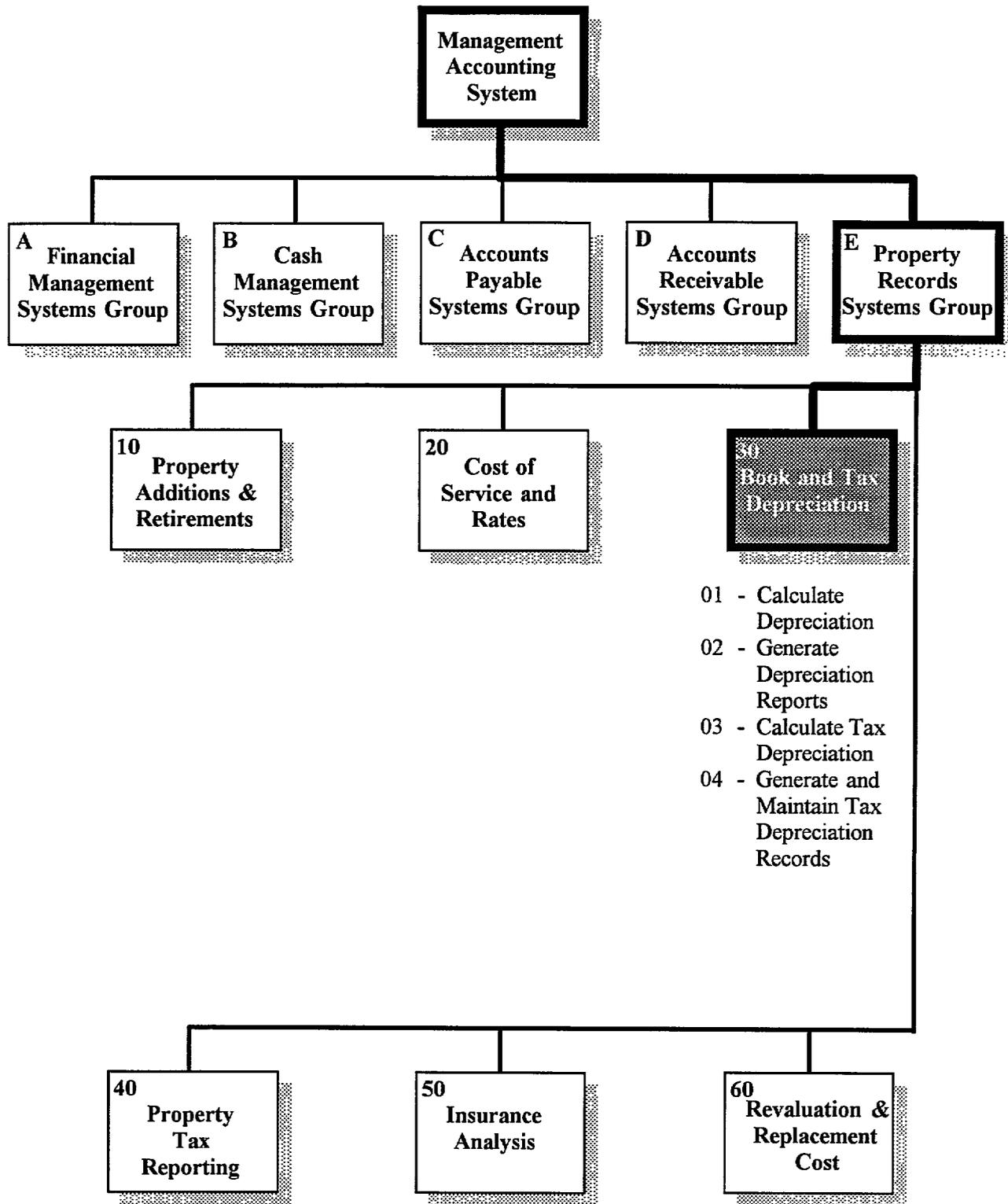
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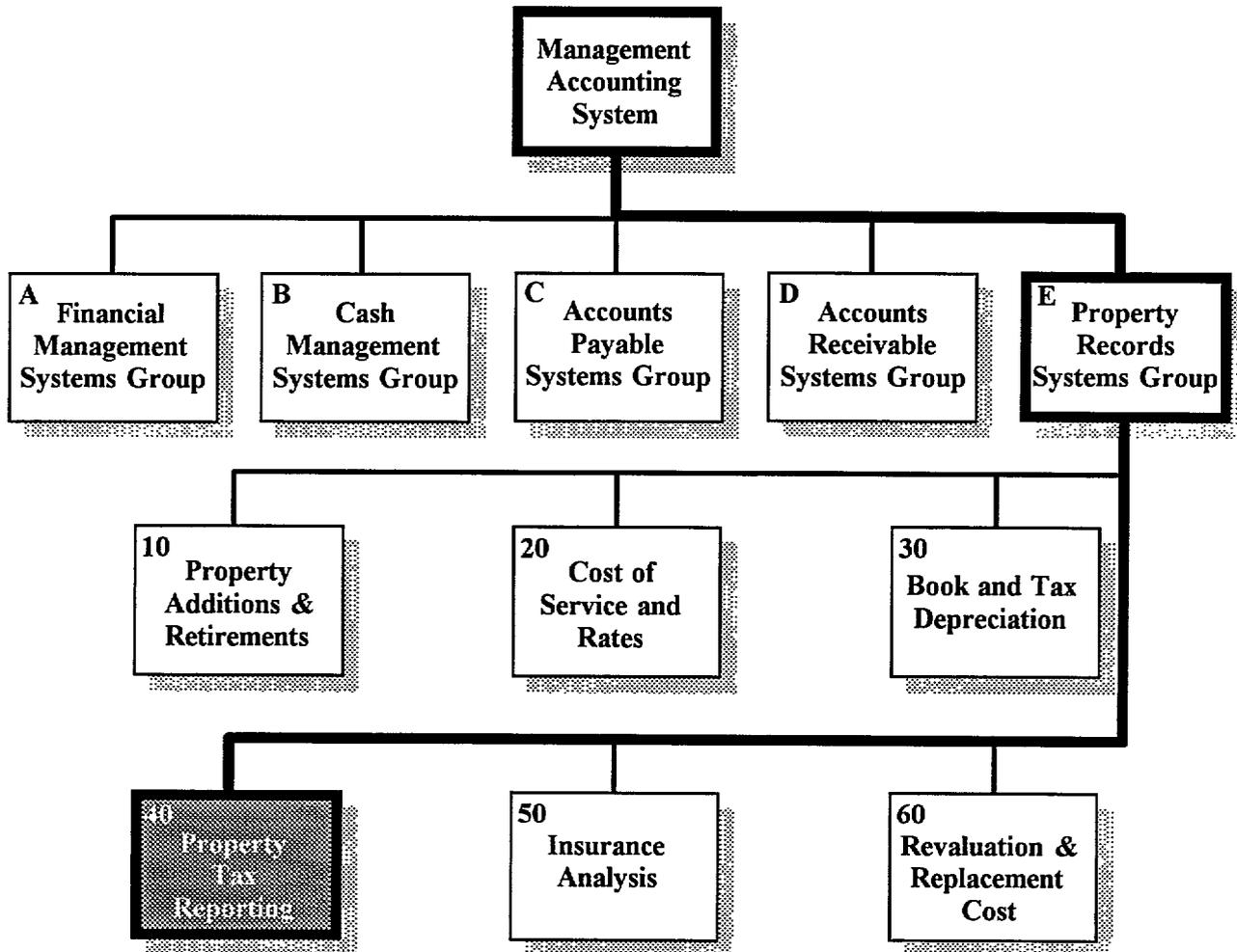
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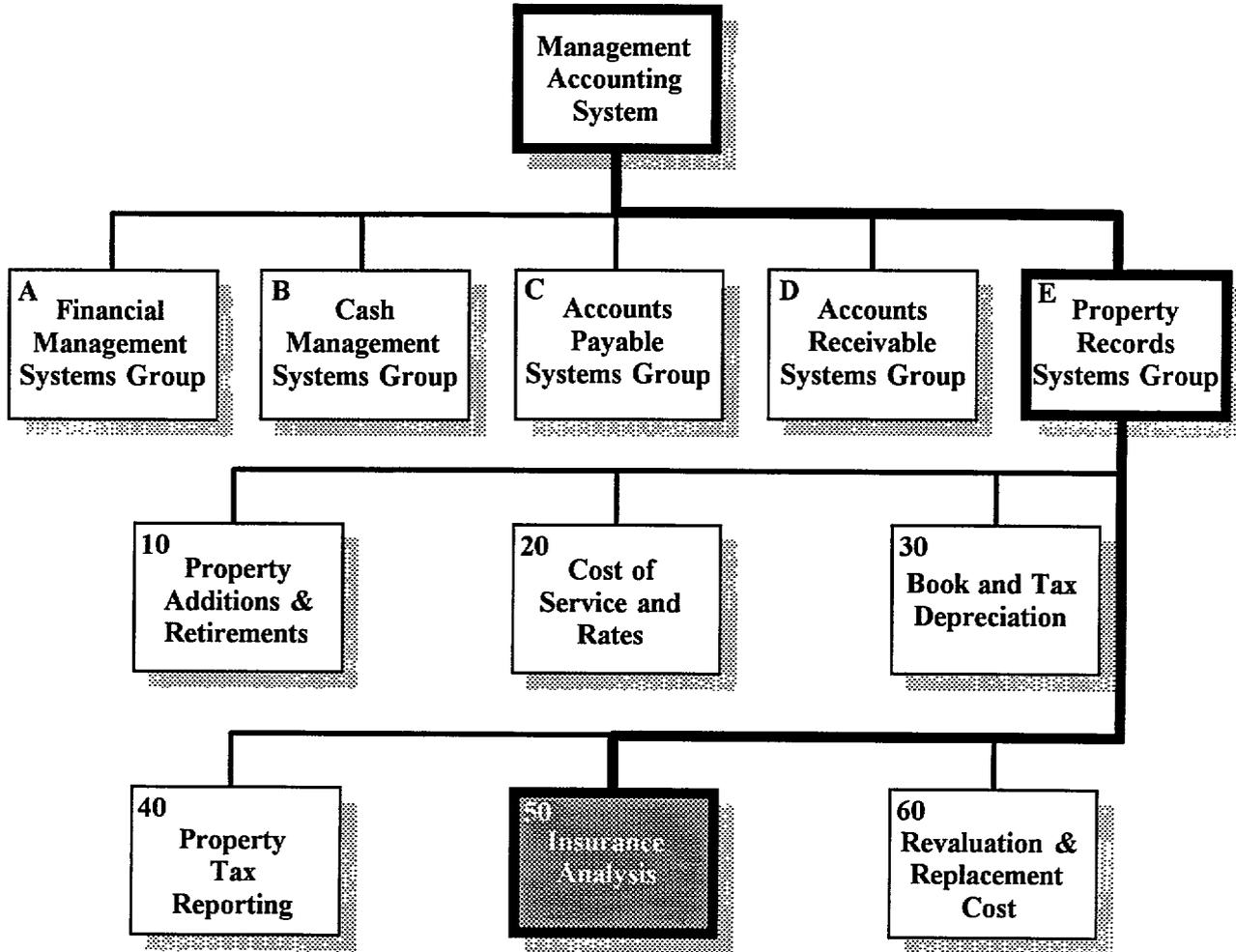


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- 01 - Generate Property Valuation Report
- 02 - Calculate Tax Liability for All Properties

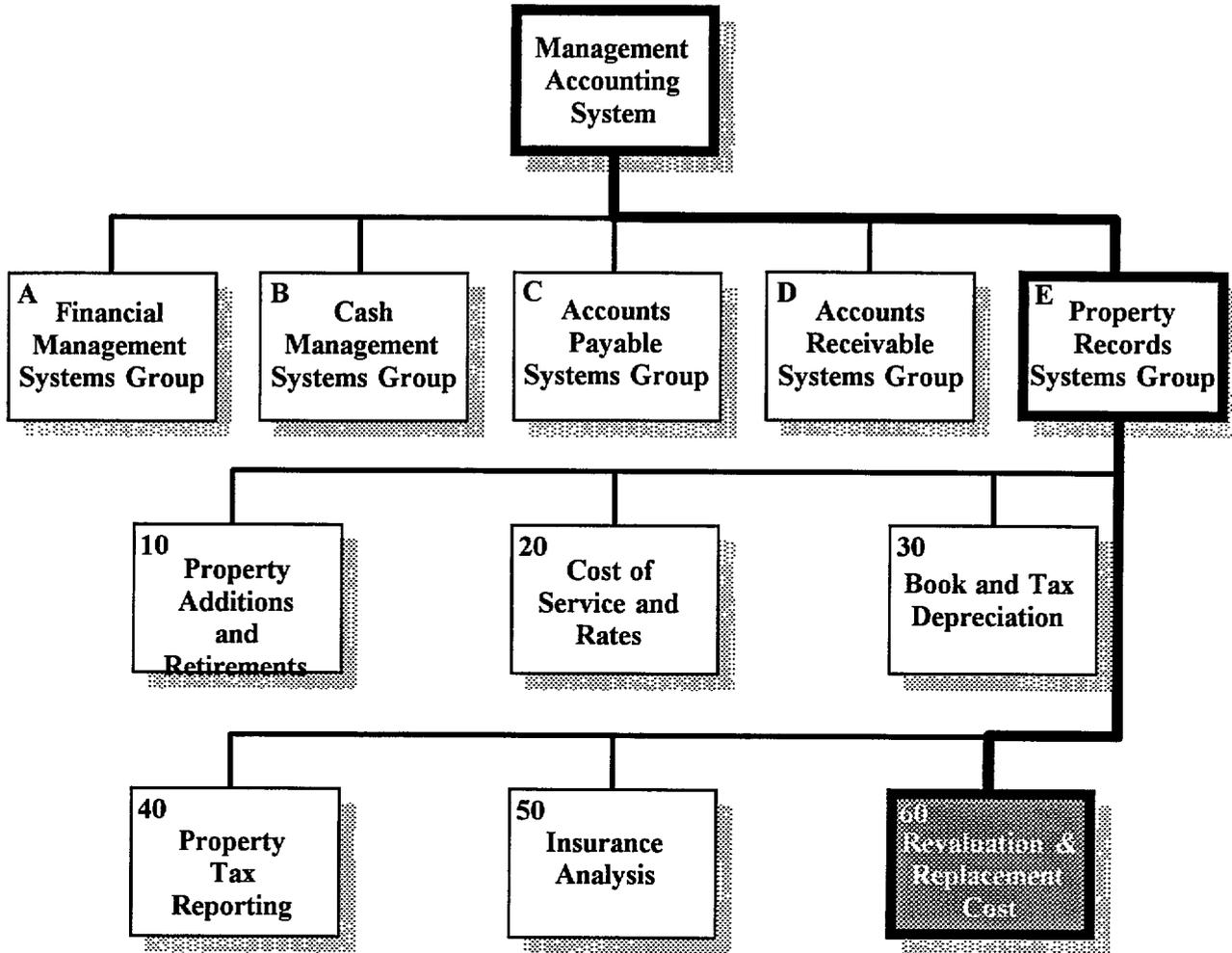
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- 01 - Provide Trustee Information
- 02 - Prepare and Report Information to Insurance Brokers
- 03 - Provide Insurance Data for Analysis of Coverage and Risk
- 04 - Determine Insurance Value for Facilities

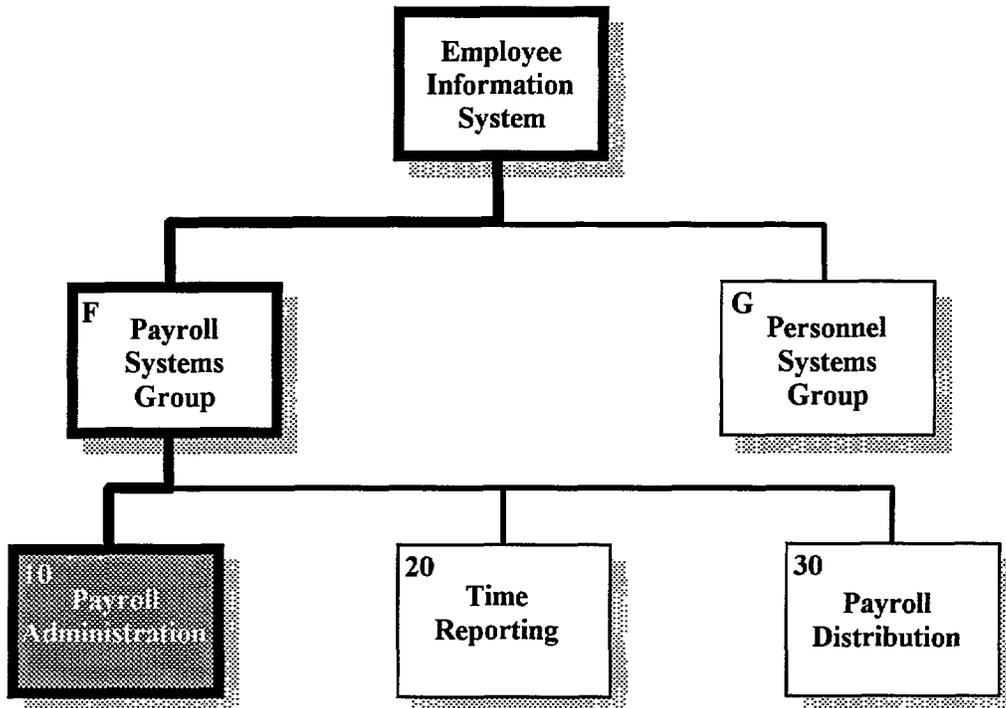
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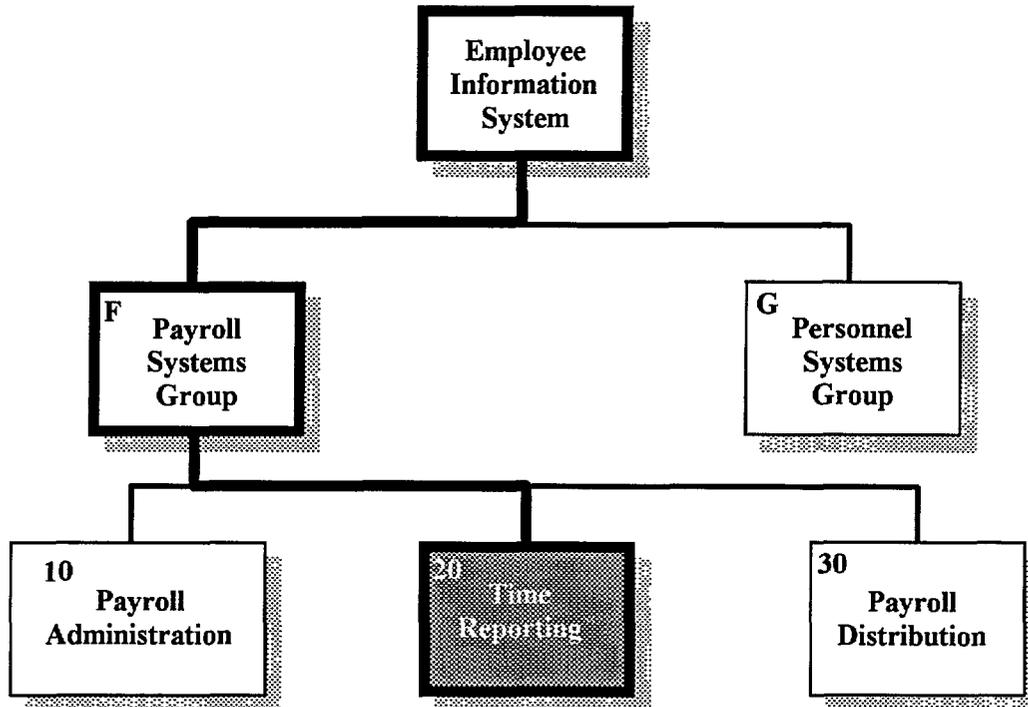
- 01 - Calculate Revaluation Cost of Property
- 02 - Generate Revaluation Cost of Property Report
- 03 - Calculate Replacement Cost of Property
- 04 - Generate Replacement Cost of Property Report

Ukraine Energy



- 01 - Maintain Bank Account Information
- 02 - Maintain Pay Slip Distribution File
- 03 - Maintain Bonus and Supplemental Pay Data
- 04 - Generate Reports for Payroll, Overtime, Excused Time, etc.
- 05 - Maintain Withholding Information
- 06 - Maintain Data on Company Contributions to Social and Retirement Fund

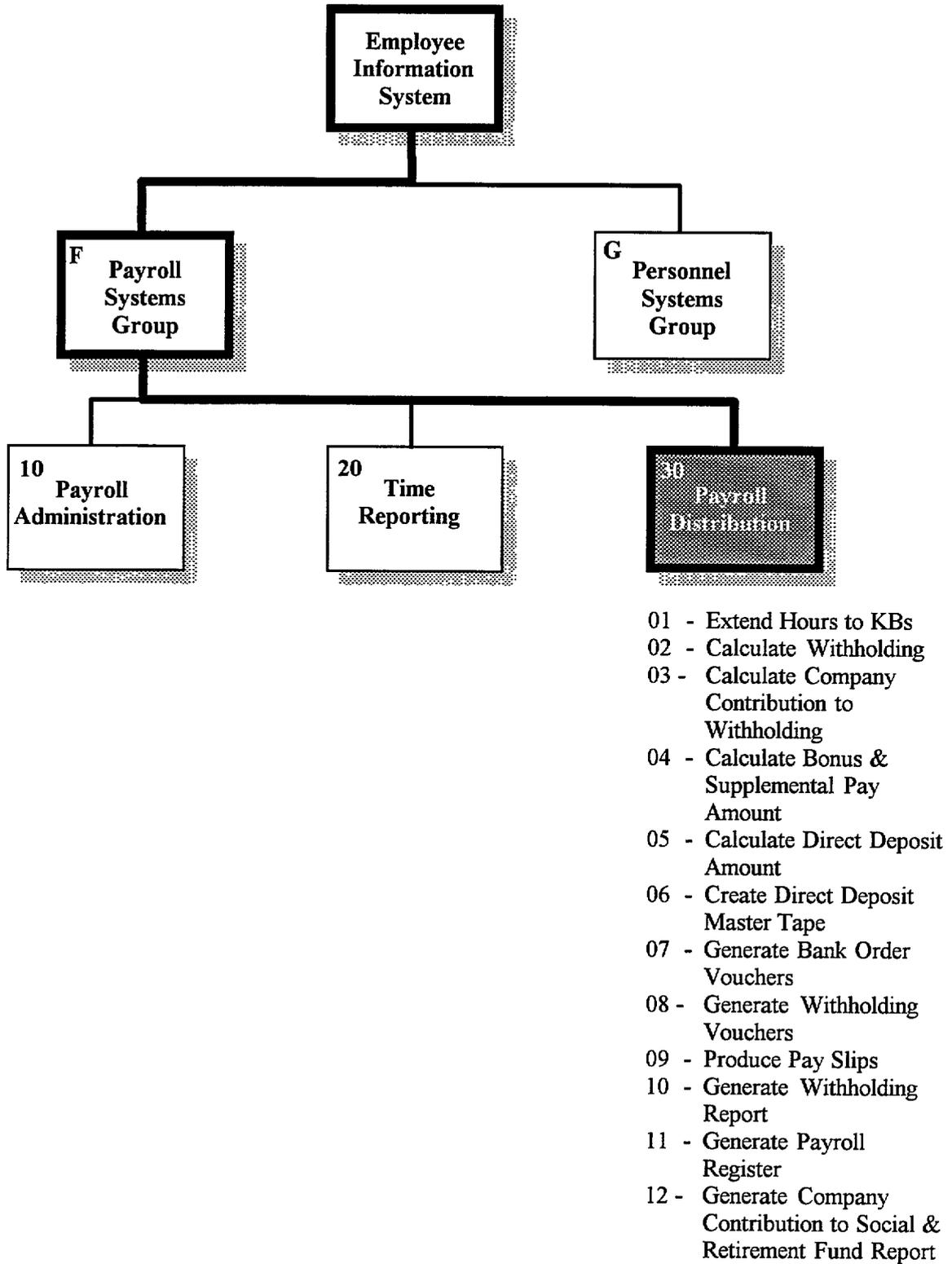
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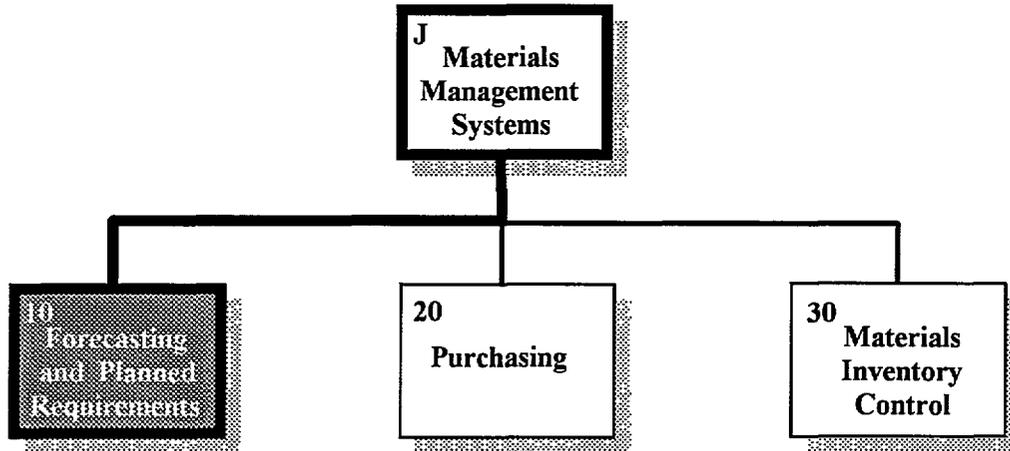
- 01 - Capture Time Reported by Employee and Account Number
- 02 - Generate Labor Account Number Edit
- 03 - Produce Time Reports

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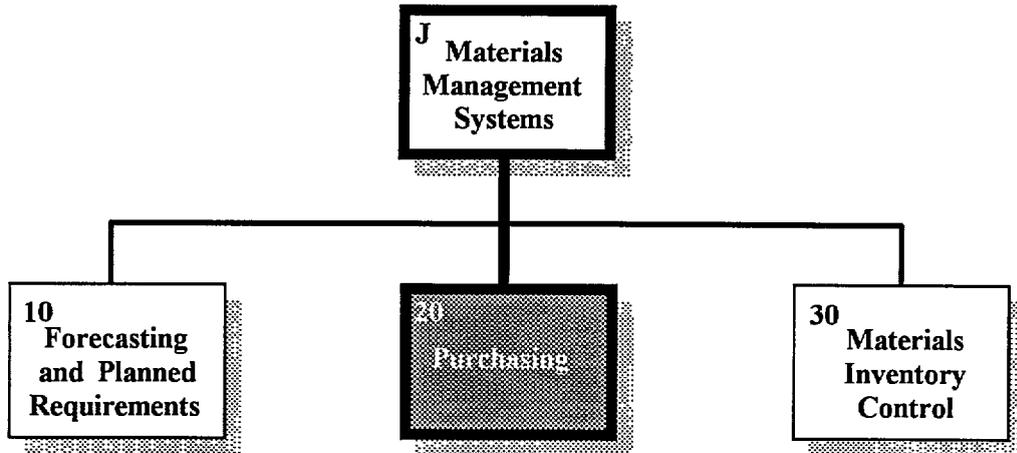


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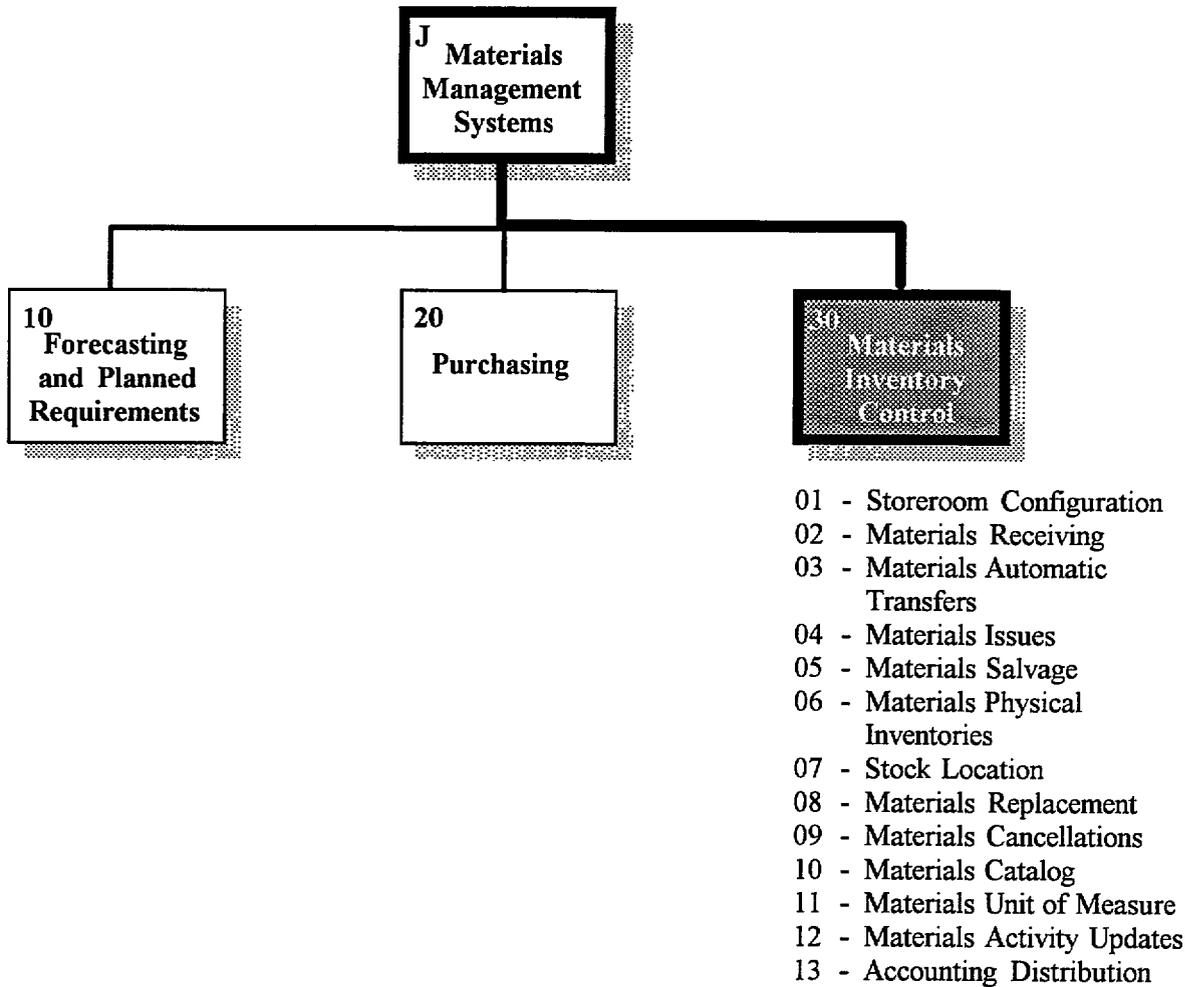
- 01 - Materials Requirement Collection
- 02 - Materials Statistical Forecasting
- 03 - Materials Planned Requirements
- 04 - Reorder and Transfer Point Calculation
- 05 - Order and Transfer Quantity Calculation
- 06 - Material Control Decision Processing
- 07 - Materials Analysis Reporting
- 08 - Vendor Lead Time Measurement
- 09 - Job Availability Simulation

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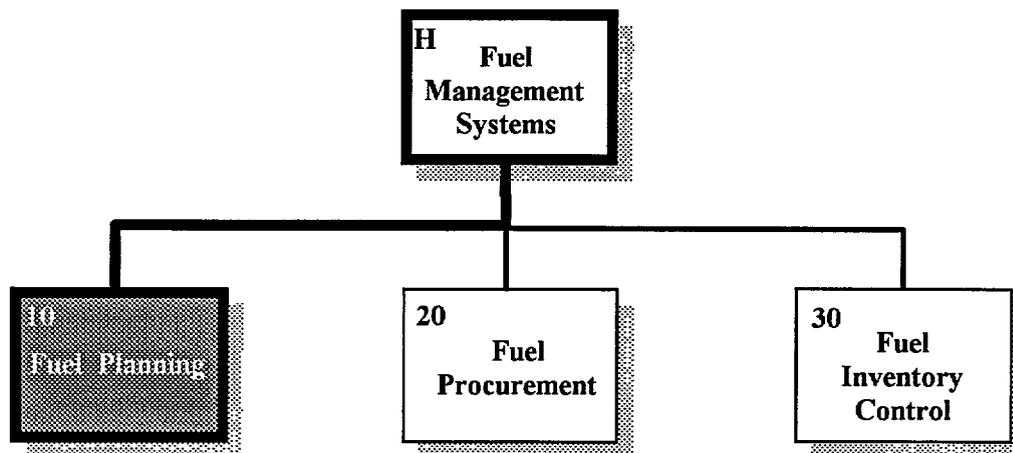


- 01 - Materials Requisitioning
- 02 - Generate Purchase Orders
- 03 - Material Receipt Processing
- 04 - Generate Vendor Performance Reports
- 05 - Requisition Tracking
- 06 - Request for Quotation
- 07 - Blanket Purchase Order Processing
- 08 - Acknowledgment Tracking
- 09 - Delivery Date Tracking
- 10 - Backorder Control

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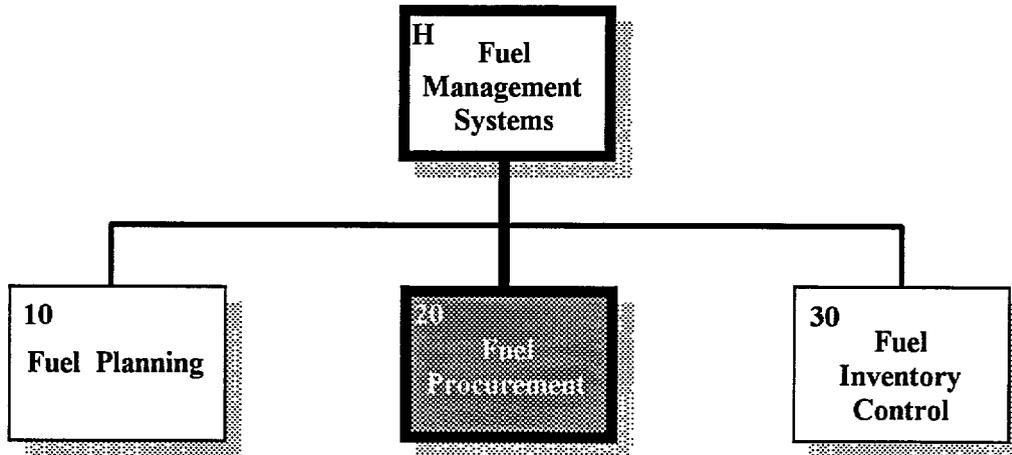


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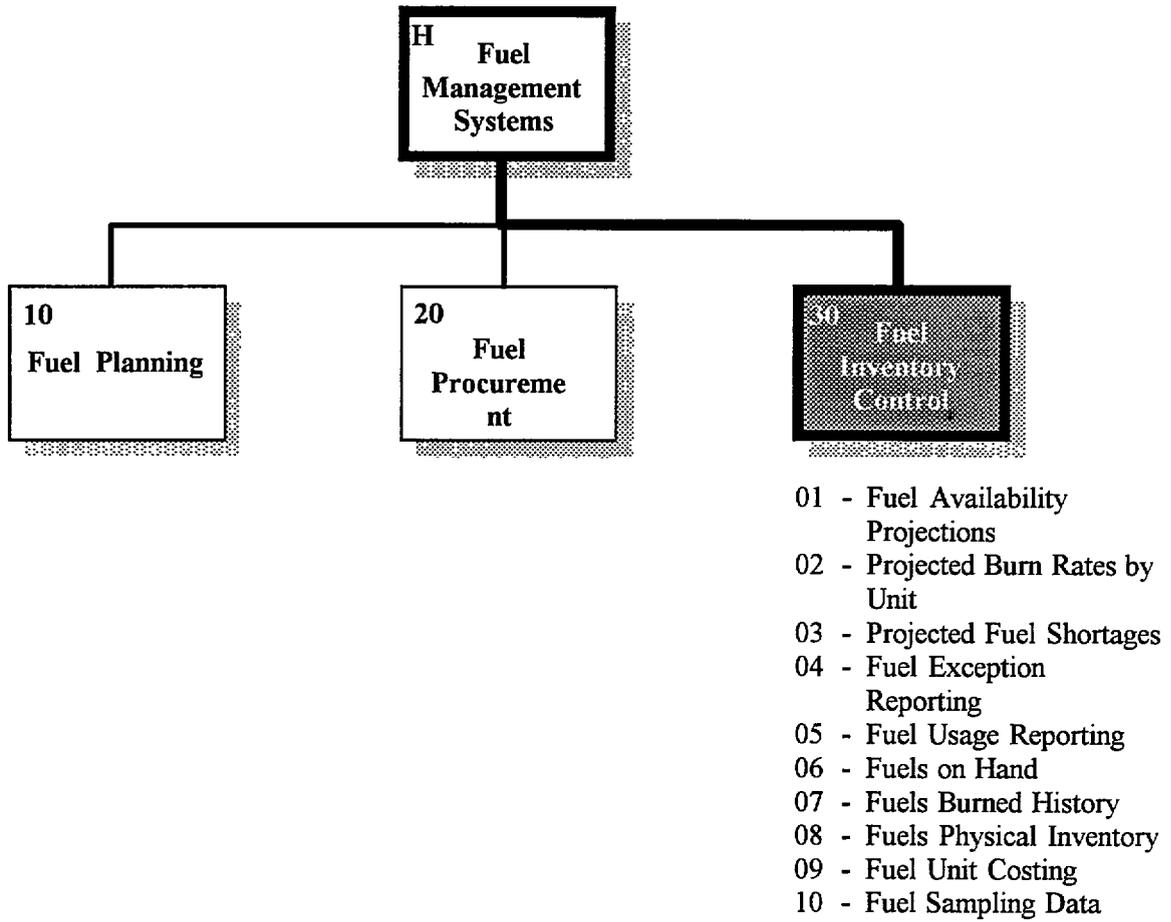
- 01 - Load Forecast Data Analysis
- 02 - Weather Forecast Data Analysis
- 03 - Fuel Source Analysis
- 04 - Vendor and Transportation Data Analysis
- 05 - Fuel Usage History Analysis
- 06 - Heat Rate Analysis
- 07 - Fuel Options Analysis
- 08 - Fuel Plan Projections

Ukraine Energy



- 01 - Vendor Analysis for Producers and Carriers
- 02 - Fuel Contract Negotiation Analysis
- 03 - Vendor Performance Ratings
- 04 - Fuel Purchase Order Generation
- 05 - Fuel Purchase Order Follow-up and Analysis
- 06 - Fuel Shipment Tracking
- 07 - Fuel Receipt Analysis
- 08 - Fuel Receipt Purchase Order Posting
- 09 - Fuel Quality Evaluation
- 10 - Fuel Contract Premium or Penalty Clause Analysis

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III. FUNCTIONAL DESIGN**B. Functional Design Definitions**

This section provides detailed definitions for the functional design shown in the previous section (III.A. Information Systems Functional Design). Definitions have been developed for four of the Information Systems overviewed in the previous section. These four systems are:

1. Management Accounting System
2. Employee Information System
3. Fuel Management System; and
4. Materials Management Systems Group.

Detailed definitions for these four systems are on the following pages.

1. Management Accounting System

The Management Accounting System supports a broad range of business activities. Most of the source data for this computer system originates in other business systems throughout the company and is gathered into the accounting computer systems. Various activities, such as calculating costs, creating journal entries, and posting to ledgers are supported in Management Accounting.

FINANCIAL MANAGEMENT SYSTEMS GROUP

The financial records of the company are maintained, and financial, forecast and other supporting reports are prepared. Financial and statistical data is maintained for use by other computer systems. Established internal controls are maintained over financial records. Financial Management includes the distribution and journalization of entries, as well as the allocation of direct cost and the maintenance of clearing rates. The process for restatement of local currency also occurs under Financial Management.

CASH MANAGEMENT SYSTEMS GROUP

Support is given to recording and forecasting cash receipts and disbursements on a daily basis. Deposits, disbursements and transfers are tracked by bank and type of transaction. Estimated revenues and disbursements are accumulated and recorded daily to provide estimates of cash flow and outside financing requirements. Information is maintained for each bank account to facilitate reconciliation. Interfaces with Accounts Payable and Payroll collect data on known disbursements. Actual cash flow statements, with comparison to budgets, provides for analysis of variances.

ACCOUNTS PAYABLE SYSTEMS GROUP

Matching of invoices is completed, with supporting documentation for approval purposes. Accounts Payable bank orders or checks are printed, as are the related registers, ledgers, and accounting entries.¹ Immediate control is established over invoices as they are received. Invoices are tracked for determination of their status and the correct payable amount. An interface with Materials Management provides for matching purchase orders and receiving report data with invoices.

¹ In the system design, capability will be included to print checks as well as bank orders, so that if and when checking accounts become a familiar and standard part of the Ukraine banking practices, the systems will be able to accommodate this functional requirement. The functions for printing and processing checks would be applied to the Accounts Payable, Accounts Receivable and Payroll systems.

Cash requirements are provided to Cash Management, with constant updates of the range of days from the earliest required payment date to the latest acceptable payment date.

Approved invoices are entered with the required information. Bank orders are automatically printed when payable, with the combining of invoices from the same vendor. Data is maintained for year-end statements of interest, rent, and independent contractor payments.

Support is given to bank reconciliation, and to analysis of voucher and draft payments from both an accounting and disbursement basis. Built in audit trails are provided.

ACCOUNTS RECEIVABLE SYSTEMS GROUP

Data on amounts owed to the company are maintained. Credit information is maintained according to the companies credit policies. Aging of accounts receivables are tracked and maintained, and uncollectible accounts are written off according to company policy. Billing data is maintained, bills are prepared and rendered. Journal transactions are prepared for accounting. Tracking of settlement accounts is supported and reconciliation with accounting is carried out. Receivable information is supplied to the Cash Management System to support the short-term cash forecasting process.

PROPERTY RECORDS SYSTEMS GROUP

Current records are maintained for the physical property, plant and equipment that the company owns and operates. This includes original cost data, revaluation and replacement cost, as well as information on tests, inspections, maintenance, performance and operating characteristics. Several business activities are supported relating to cost-of-service, depreciation, property tax, insurance and replacement cost, and engineering studies.

a. FINANCIAL MANAGEMENT SYSTEMS GROUP

Financial Management supports three major functional areas: Planning and Control, General Accounting, and Financial and Regulatory Accounting.

Planning and Control

Planning and Control consists of four groups of functional capabilities:

Operation and Maintenance Planning

This group of capabilities supports the collection and maintenance of activity and project planning data. Functional capabilities are:

- 01 Create Functional Planning Reports
Forecasts for group activities may be maintained and reported in various ways relative to the business unit organization, such as by activity, project, account number and expense type category. Forecasting period may be defined as short-term (by day, week or month) or long-term (by year).
- 02 Update Functional Plan
The planning unit, or group, can add, change, transfer, or delete activity, project or account information from their forecast.
- 03 Extend Planned Man-Hour Units to Kb's
Planned labor cost and total cost per activity are calculated for the year.
- 04 Revise Planned Functional Unit Cost
Adjustments or corrections to forecasted function unit costs may be made.
- 05 Initiate Special Projects Forecast
Management may include special projects in its planning.
- 06 Revise Special Projects Forecast
Adjustments or corrections to special projects may be made.
- 07 Identify Planned Group Cross Charges and Clearing
This capability enables accounting charges to be made for work done by personnel for a group other than their assigned group. Suspense charges may be allocated back to Operations, Maintenance, or Construction using the same clearing rates that are maintained in the General Accounting System.

Operation and Maintenance Reporting

This group of functional capabilities supports the collection and reporting of data reflecting planned operating and maintenance activities. Reporting may be by activity and by project. Functional capabilities are:

- 01 Report Actual Vs. Forecast Costs
Actual Costs are compared to forecast cost by group, as required by management. Examples would be by account number, planning activity, resource cost and category cost.
- 02 Summarize Actual Vs. Forecast Variances
Actual and forecast costs are accumulated and compared on a current month and year-to-date basis for each account number, planning activity, resource, and category, for each business unit summarized to each level of responsibility.
- 03 Perform Variance Analysis
Detail behind each variance category is provided to identify why the variance has occurred. Determination can then be made as to whether the variance will continue to year-end or if it is a period variance only.
- 04 Produce Special Project Reports
Monthly reports are produced on all special projects.

Capital Expenditure Planning

This group of functional capabilities supports the collection and maintenance of construction and retirement planning information. Functional capabilities are:

- 01 Create Capital Planning Report
Capital Expenditure planning is reported by project authorization.
- 02 Update Capital Expenditure Forecast
The planning unit, or group, may add new authorizations, and change or delete existing ones.
- 03 Extend Capital Man-Hour Units to Kb's
Planned labor cost and total cost per authorization are calculated for the year.

- 04 Produce Capital Expenditure Reports by Area, Group, Sub-Group, Category, Resource, etc.
The capital expenditure forecast data maintained may be summarized and reported in various ways relative to business unit categories.
- 05 Revise Construction Budget for Up-to-Date Costs
Adjustments or corrections to planned construction budget are made to up-date costs.

Capital Expenditure Reporting

This group of functional capabilities supports the collection and reporting of capital expenditures data by project number. Functional capabilities are:

- 01 Report Actual Vs. Forecast Construction Costs
Each group receives a report comparing actual vs. forecast construction costs.
- 02 Summarize Actual Vs. Forecast Construction Variances
Actual and forecast construction costs are accumulated and compared on a current month and year-to-date basis for each project number, and for each business unit summarized to each level of responsibility.
- 03 Perform Capital Forecast Variance Analysis
Detail behind each project variance is provided to identify why the variance has occurred. Determination can then be made as to whether the variance will continue to year-end or if it is a period variance only.
- 04 Produce Cost to Complete Report
Based on capital project variance analysis, revised forecast for project completion cost is developed.

General Accounting

A framework is provided for integrating logically related accounting activities at an intermediate level between the computer systems generating the basic data and the reporting systems where there is a need for summarization of this data. General Accounting calculates financial and statistical data, distributes and summarizes data into journal entry format, creates journal and voucher registers and control account entries, and calculates clearing rates. Functional capabilities are:

- 01 Generate All Accounting Distributions
Detail application system transactions are summarized to a journal entry format for preparation of the automatic journal entry.
- 02 Generate Recurring Manual Journal Entries
Journal entries are generated for items which recur on a regular schedule, such as monthly amortization.
- 03 Generate Journal and Cash Voucher Registers
Journal and cash vouchers are collected and maintained for listing in register form.
- 04 Distribute Administrative and General Expenses
Administrative payroll, and goods and services provided to all business units and groups are allocated and charged to those business units.
- 05 Allocate Common Expenses
Expenses common to more than one business unit are allocated and charged to those units based on a pre-determined factor for allocation of the various facilities.
- 06 Calculate Stores Expense Clearing Rates
The ratios used to distribute stores expense are calculated.
- 07 Calculate Construction Overhead Clearing Rates
The ratios used to distribute construction overhead expenses are calculated.
- 08 Calculate Unallocated Payroll Clearing Rates
The rates used to distribute unallocated payroll charges are calculated.
- 09 Distribute Unallocated Payroll Charges
Holiday, vacation and excused time payroll charges are allocated and

- charged to the business units involved.
- 10 Calculate Profit and Other Taxes
Tax bases are calculated to the extent defined.
 - 11 Distribute Stores Expense
The overhead from the stores activities is allocated and charged to the business units involved.
 - 12 Distribute Construction Overheads
The overheads applicable to construction activities are allocated and charged to the appropriate projects.
 - 13 Generate Payroll Accruals and Reversals
Month end unpaid payroll expenses are accrued for closing and automatically reversed at the beginning of the next fiscal month.
 - 14 Unitize and Transfer Construction Work-In-Progress to Plant-In-Service
Completed blanket construction jobs are unitized and transferred from Construction Work-In-Progress to Plant-In-Service status.
 - 15 Generate All Automated Journal Entries
Journal entries are generated for items received from other computer systems with no manual intervention, or with a minimum of manual intervention.
 - 16 Generate Journal Entry Facing Pages for General Ledger
Entries are generated for control accounts.
 - 17 Generate Offset Accounting System Detail Ledger Entries
Debit and credit offset entries are generated as defined.
 - 18 Generate Financial and Statistical Transaction Data
Data for financial and statistical transactions is generated.
 - 19 Maintain Classification Data
Account classification data is maintained.
 - 20 Record Ancillary Operations Expenses
Expenses of ancillary business units are recorded for reporting purposes.

- 21 Record all Barter Transactions
Detailed accounting records are maintained allowing for the identification of quantities of goods or services provided to specific parties, quantities of goods or services received from specific parties, unit prices assigned to specific barter transactions, and amount of net barter receivable or payable balances to specific parties at the end of an accounting period.
- 22 Generate Journal Entry for Barter Transactions
Maintain running balance of receivables and/or payables with specific bartering partners. The value of assets and services received under barter agreement are recorded as liabilities. The value of assets and services delivered under barter agreement are recorded as receivables. Ending balances are used to generate a journal entry for the accounting period.

Financial and Regulatory Accounting

Financial and Regulatory Accounting supports company requirements for financial and regulatory record keeping and reporting. It consists of two groups of functional capabilities.

Financial and Statistical Ledgers

Data is collected from other parts of the Management Accounting System and posted to the appropriate ledgers. Functional capabilities are:

- 01 Maintain Ledgers for Financial and Statistical History Information
History is maintained for financial and related statistical data.
- 02 Maintain Ledgers for Financial and Statistical Information for Ancillary Operations
History is maintained for financial and related statistical data for ancillary operations.
- 03 Restate Financial and Statistical Data in Hard Currency
Financial and statistical data is restated from Kb's to a hard currency (i.e. dollars) for producing financial reports which meet foreign investor requirements.
- 04 Restate Financial and Statistical Data for Inflationary Adjustments
Financial and statistical data is adjusted and restated to reflect inflation changes in the Kb.

Financial Reporting

Financial reports are produced as required. Functional capabilities are:

- 01 Prepare Financial and Statistical Reports for Management
Financial and statistical results of operations are generated to report specifications.
- 02 Prepare Reports for Investors and Regulators
Financial and regulatory reports are prepared as required.
- 03 Prepare Ledgers and Income Statements
The monthly General Ledger, the Income and Expense Statement and other required reports are generated and formatted.
- 04 Prepare Ledgers and Statistical Reports for Ancillary Operations
The monthly General Ledger, Expense Reports and Statistical Reports are generated and formatted for all ancillary operations of the generating plant.

b. CASH MANAGEMENT SYSTEMS GROUP

Cash Management supports requirements in three areas: Short Term Cash Requirements, Long Term Cash Requirements, and Daily Processing.

Short Term Cash Requirements

Data is accumulated and spread by day for estimated and known liabilities and commitments. Accounts Payable and Payroll provide data through interfaces. Primary functional capabilities are:

- 01 Generate Projections of Daily Cash Receipts
Using historical cash receipts data trends can be projected which will extend daily cash receipts for the specified short term forecasting period. Known receivables are also included in these projections.
- 02 Determine Disbursements and Known Liabilities
Central Invoice Processing will provide disbursements and known liabilities due during the forecast period.

- 03 Generate Short Term Cash Requirements
Utilizing projections of receipts and disbursements, cash shortages and cash excess projections are generated for the defined forecast period.

Long Term Cash Requirements

Support is given to forecasting cash receipts, disbursements and projected cash needs accordingly. Functional capabilities are:

- 01 Determine Estimated Cash Flow
Cash flow is estimated, based on forecasts of receipts and disbursements utilizing data from Financial Planning, Accounts Payable and Cash Management.
- 02 Determine Proceeds from Future Bond Issues
Future bond issues are analyzed to determine potential proceeds.
- 03 Determine Proceeds from Future Stock Issues
Future stock issues are analyzed to determine potential proceeds.
- 04 Compute Total Construction Commitments
Construction commitments are analyzed and summarized to project long term cash requirements.
- 05 Compute Long Term Liabilities
Liabilities are analyzed and summarized to project long term requirements.
- 06 Compute Bond Retirement Sinking Fund Requirements
Maturity dates of outstanding bond issues are analyzed to determine sinking fund requirements.
- 07 Compute Preferred Stock Sinking Fund Requirements
Maturity dates of outstanding preferred stock issues are analyzed to determine sinking fund requirements.

Daily Processing

Cash receipts and disbursements are recorded on a daily basis. Actual deposits, disbursements and transfers of cash are tracked by bank and type of transactions. Detailed information is maintained for each bank account. Cash flow forecasts are monitored for variances between actual and planned amounts. Functional capabilities are:

- 01 Record Cash Receipts
Cash receipts are recorded by deposit and by bank.
- 02 Record Known Liabilities
Known liabilities are recorded by various categories and by due date.
- ** 03 Record Cleared Checks
Cleared checks are recorded for further processing.
- ** 04 Update Bank, Vendor, and Mail Floats
Bank, vendor, and mail floats are tracked and recorded.
- 05 Determine Bank Balance Requirements
Balances required in each bank account are monitored.
- 06 Monitor Cash Forecast to Actual Requirements
Cash forecasts are compared with actual requirements.
- 07 Maintain Corporate Cash Books
Corporate cash books are maintained.
- 08 Generate Bank Transfer Requirements
Required transfers between banks for maintaining minimum required balances are determined.
- 09 Prepare Bank Reconciliation
All bank accounts are reconciled.
- 10 Record Paid Liabilities
All liabilities paid are recorded, crediting cash and debiting Accounts Payable.

** These functions apply to the future potential for check processing capability.

c. ACCOUNTS PAYABLE SYSTEMS GROUP

Accounts Payable supports Invoice Receipts, Voucher Processing, and Voucher Payment.

Invoice Receipts

Invoices received are immediately entered into the system to editing documentation for approval purposes. Functional capabilities are:

- 01 Establish Vendor Records
All new vendor names and mailing addresses are entered into the vendor master file.
- 02 Input Invoices
All invoices received are entered into the system.
- 03 Edit and Validate Invoices.
Invoices are matched against the vendor master file to determine if it is a valid vendor and a authorized invoice.

Voucher Processing

Vouchers are created from invoices and checked against purchase orders. Payment due dates are determined and cash requirements are updated. Functional capabilities are:

- 01 Determine Payment Due Date
Based on invoice date and terms of payment, voucher due dates are calculated.
- 02 Calculate Daily Disbursement Totals
Based on payment due dates daily disbursement amounts are determined for cash forecasting purposes.
- 03 Match Vouchers to Material Receipts
Validation is made through Materials Management System to be sure materials have been received according to requirements.
- 04 Maintain Aging Records
Payment due dates are maintained for all vouchers and common due dates are matched so that multiple pay vouchers to a vendor can be combined for payment. Averages for aging of vouchers is maintained.

- 05 Prepare Month-End Voucher and Vendor Reports
Records of vouchers paid by vendor and voucher number are produced.
- 06 Create Month-End Account Distribution Report for General Ledger
Charges by account number for the month are accumulated for posting to the general ledger.
- 07 Create Pre-payment Voucher
Vouchers are created to record all pre-payments that are necessary to make. Payments are charged directly to a pre-payment account number. A separate pre-payment register is maintained to reconcile that materials are actually received for pre-payments made.

Voucher Payment

Bank orders are automatically printed when payable, and records are maintained of payments. Functional capabilities are:

- 01 Determine Pay Status
Payment due dates are evaluated to determine which invoices are due for payment on the designated payment date.
- 02 Generate Bank Orders
Bank Orders are printed for all payments due on the designated payment date.
- 03 Generate Payment Analysis Report
A bank order register is generated showing bank order number, bank order date, amount, payee, and vouchers covered by the payment.

d. ACCOUNTS RECEIVABLE SYSTEMS GROUP

Accounts Receivable supports requirements in three areas: Credit Maintenance, Bill Preparation and Payment Processing.

Credit Maintenance

Active accounts having an arrears of a specified number of days are evaluated. Based on their credit history, further actions may be taken. Functional capabilities are:

- 01 Monitor Accounts Receivable
Active accounts with open balances are monitored. When an arrears condition occurs, further action may be taken.
- 02 Maintain Data for Open Balance and Aged Accounts Receivable Lists
Data is maintained for use in Open Balance lists and Aged Accounts Receivable lists.
- 03 Write Off Uncollectible Accounts
Accounts determined to be uncollectible are written off.

Bill Preparation

A statement is prepared detailing all components of the charges to be billed, or settlements that are due from Energomarket. Functional capabilities are:

- 01 Calculate Current Bills
Current energy charges are calculated by type of charge.
- 02 Calculate All Other Charges
All charges for any other product or service are calculated.
- 03 Calculate Late Payment Charges
Late payment charges are calculated based on arrears at the time of second billing.
- 04 Prepare Bills
The current bill, including any miscellaneous charges which are in arrears, is prepared.
- 05 Print Reminder Messages
Bills having charges in arrears which fail to meet credit specifications have reminder messages printed.
- 06 Generate Revenue and Accounts Receivable Journal Entries for Accounting
Revenue and accounts receivable journal entries are prepared for accounting.
- 07 Late/Rebill Preparation
Bills may be created on request.

Payment Processing

Functional capabilities included in Payment Processing are:

- 01 Process Full Payments
Full payments of unpaid balances clear all charges current and in arrears. Reconciliation of payments from Energomarket carried out.
- 02 Process Partial Payments
Partial payments may be posted to a holding account for unidentified payments (see #5 below) or the amount paid may be directed to any of the items included in the bill.
- 03 Provide No-Bill Records
Posting slips may be prepared for payments not accompanied by a bill, provided the payment can be identified.
- 04 Post Payments to Written Off Accounts
Payments to written off accounts are posted to those accounts.
- 05 Post Unidentified Payments
Payments which cannot be identified because of missing or erroneous account numbers are posted to a unique account and retained within the system until they are identified and transferred to the proper account.
- *** 06 Post Bank Returned Checks
Customer checks returned by the bank are posted against the customer record, placing the account in it's original receivable position.

e. PROPERTY RECORDS SYSTEM GROUP

Property Records supports Property Additions and Retirements, Cost and Rate Studies, Book and Tax Depreciation, Property Tax Reporting, Insurance Analysis, and Revaluation and Replacement Cost for physical plant.

*** These functions apply to the future potential for check processing capability.

Property Additions and Retirements

Records are set up for all property that is added to physical plant. Records are maintained until the property is taken out of service and retired. Functional capabilities are:

- 01 Determine Property Additions to Plant
When construction jobs are completed or equipment is placed in service, records are created in the property records master file.
- 02 Generate Property Additions Report
Reports are produced showing all plant in service with additions to plant for the current reporting period being highlighted.
- 03 Determine Property Retirements from Plant
Plant and equipment which is taken out of service is evaluated to determine that depreciation has been properly settled.
- 04 Generate Property Retirements Report
Property retired during the designated reporting period is listed.

Cost and Rates

The rate base is analyzed to determine revenue requirements, utilizing data from Property Additions and Retirements. Cost information is provided. Functional capabilities are:

- 01 Generate Cost Analysis
Cost studies are fully supported as required, such as generation factor, types of fuel, time of day and related maintenance cost.
- 02 Generate Rate Analysis
The rate base is analyzed from several points of view, such as the effects of depreciation vs. new facilities in service.

Book and Tax Depreciation

Depreciation on all capitalized facilities is calculated and maintained. Allowance is made for differing modes and schedules of depreciation for book and tax purposes. Functional capabilities are:

- 01 Calculate Depreciation
Book depreciation is calculated for each facility according to a predetermined mode and schedule.
- 02 Generate Depreciation Reports
The calculated depreciation is maintained and reported.
- 03 Calculate Tax Depreciation
Tax depreciation is calculated using designated tax formulas.
- 04 Generate and Maintain Tax Depreciation Records
The calculated tax depreciation is maintained and reported.

Property Tax Reporting

Support is given to maintaining data concerning property valuations and tax liabilities. Reports are produced for each taxing jurisdiction. Functional capabilities are:

- 01 Generate Property Valuation Report
Based on data maintained for each taxing district reports are provided detailing valuation of property.
- 02 Calculate Tax Liability for All Properties
Based on property valuation within districts, and applicable tax rates, property tax liabilities are calculated.

Insurance Analysis

Provision is made for the analysis of corporate assets and related insurance coverage. This information can be reported in a variety of formats for different recipients. Functional capabilities are:

- 01 Provide Trustee Information
Information required by trustees is provided.
- 02 Prepare and Report Information to Insurance Brokers
Information required by insurance brokers is prepared and reported.
- 03 Provide Insurance Data for Analysis of Coverage and Risk
Data required for the analysis of the company's insurance coverage and risk factors is provided.

- 04 Determine Insurance Value for Facilities
The amount of insurance that should be carried on the various facilities is determined and periodically updated for replacement cost.

Revaluation and Replacement Cost

Replacement cost are calculated for the various facilities the company has in service. Facilities are also revaluated to adjust for currency fluctuations.

- 01 Calculate Revaluation Cost of Property
Revaluation of facilities is calculated based on fluctuations in currency.
- 02 Generate Revaluation Cost of Property Report
Reports are generated showing the results of revaluation calculations.
- 03 Calculate Replacement Cost of Property
Replacement costs are calculated for all facilities.
- 04 Generate Replacement Cost of Property Report
Reports are generated on the replacement costs calculated.

2. Employee Information System

The Employee Information System collects and maintains data required to support payroll and personnel activities. There is a system to support each of these major business activities. They provide information to various parts of the Management Accounting System as well as support to the Maintenance Management and Construction Management Systems.

PAYROLL SYSTEMS GROUP

Payroll collects and maintains the data required to support all activities involved in wage compensation and payroll administration.

PERSONNEL SYSTEMS GROUP

Personnel collects and maintains data used to support a number of personnel activities, including personnel history and administration, manpower planning and control, wage planning, benefits, and various employee programs. Regulatory reporting is supported.

FUNCTIONAL CAPABILITIES ARE ONLY DEFINED HERE FOR THE PAYROLL SYSTEMS GROUP, AS THAT SYSTEM HAS THE INTERFACE WITH AND SUPPORTS THE MANAGEMENT ACCOUNTING SYSTEM

a. PAYROLL SYSTEMS GROUP

Three major functional areas are supported: Payroll Administration, Time Reporting, and Payroll Distribution.

PAYROLL ADMINISTRATION

Payroll Administration maintains data required to calculate and distribute payroll to individual employees. This data includes information on what items should be withheld from the employees pay and the amount, bank account information in order to deposit payroll for employees, or pay cash, and where employee pay slips

should be sent to on designated pay days. Various payroll reports may also be produced for management and regulatory purposes. Functional capabilities are:

- 01 Maintain Bank Account Information
Employee's bank and account number are maintained in the payroll file so that payroll can be direct deposited into the appropriate account for each employee.
- 02 Maintain Pay Slip Distribution File
Work location or mailing address is kept current for each employee so that pay slips may be distributed to the proper employee location.
- 03 Maintain Bonus and Supplemental Pay Data
Data is maintained related to paying employee bonuses and supplemental pay calculations such as shift differential and special pay situations are kept.
- 04 Generate Reports for Payroll, Overtime, Excused Time, Vacation Time, Etc.
Reports are produced on schedule or as required showing labor charges, overtime, excused time, vacation time or any other appropriate payroll information.
- 05 Maintain Withholding Information
Information pertaining to each employee's payroll withholding, such as taxes, insurance and loans, is kept current.
- 06 Maintain Data on Company Contributions to Social and Retirement Fund.
Data is maintained on company contribution calculation for employee social and retirement fund accounts.

TIME REPORTING

Time Reporting captures time worked as well as time taken for holiday, vacation and excused time, and records it against the proper account numbers for each employee. Functional Capabilities are:

- 01 Capture Time Reported By Employee and Account Number
All employee time is recorded against work time or overhead categories, as well as account numbers.

- 02 Generate Labor Account Number Edit
An edit is performed matching payroll account numbers charged, against the general ledger master file to validate that all account numbers used to record payroll are valid account numbers.
- 03 Produce Time Reports
Reports are generated showing where time was recorded against for the pay period, and verifying how much time each employee had charged against each pay category.

PAYROLL DISTRIBUTION

Payroll Distribution utilizes payroll master data from the Personnel System and applies it against the time reported to calculate how much pay each employee is entitled to for the pay period. Direct deposit master files are created and the payroll register is produced. Functional capabilities are:

- 01 Extend Hours to Kb's
Hours from Time Reporting are extended to Kb's using the pay scales from the Personnel System.
- 02 Calculate Withholding
Amounts to be withheld from each employees' pay is calculated using the withholding information from the Payroll Administration module.
- 03 Calculate Company Contribution to Withholding
The company portion of contributions to employee social and retirement funds is calculated.
- 04 Calculate Bonus and Special Pay Amount
Bonuses and all types of supplemental pay are calculated by employee
- 05 Calculate Direct Deposit Amount
Direct Deposit amount for each employee is calculated.
- 06 Create Direct Deposit Master Tape
The master tape showing the bank account and amount of pay for each employee is created to send to the bank.

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- 07 Generate Bank Order Voucher
The Accounts Payable voucher is generated to record with Accounting the payroll amount which will go to the bank.
- 08 Generate Withholding Vouchers
The Accounts Payable vouchers are generated to record with Accounting the necessary company and employee withholding payments that are required.
- 09 Produce Pay Slips
Payroll slips are generated for each employee showing the gross pay, amounts withheld, and the net pay which was deposited in the employee's bank account.
- 10 Generate Withholding Report
A report is produced showing the amount and purpose for all withholding from employee pay.
- 11 Generate Payroll Register
The payroll register is generated showing the amount of pay for each employee for the pay period.
- 12 Generate Company Contribution to Social and Retirement Fund Report
Reports are produced showing the detail for company contributions to employee social and retirement funds.

3. Fuel Management Systems Group

The Fuel Management Systems Group provides for the complete planning and control of fuel and its use. Three major business activities are supported.

FUEL PLANNING

Fuel Planning collects input relative to load forecasts, weather trends and forecasts, types of fuel and their availability, vendors, transportation, and fuel sources. These variables are used to forecast final requirements over a specified period of time and to develop the trade-offs between types of fuel available from various sources at differing costs.

FUEL PROCUREMENT

Support is given to contract negotiation and administration in the purchase of fuels. The receipt of fuels is monitored from the point of producer shipment to actual receipt. In-transit shipments are tracked. Quality tests are analyzed.

FUEL INVENTORY CONTROL

Fuel Inventory Control determines the fuel required at each plant on a daily basis, using the fuel requirements projected by Fuel Planning and Load Forecasting. Fuel management reports are prepared, and the fuel inventory balance is maintained at each storage location by fuel type.

a. Fuel Planning

Functional capabilities are:

- 01 Load Forecast Data Analysis
Future generation projections are analyzed for input into the fuel requirement projections.
- 02 Weather Forecast Data Analysis
Weather forecast are used to help determine generation requirements and fuel usage.
- 03 Fuel Source Analysis
Analysis of existing and potential fuel sources is performed. Data is maintained and updated.

- 04 Vendor and Transportation Data Analysis
Vendors and fuel transporters are evaluated for delivery performance and reliability.
- 05 Fuel Usage History Analysis
History of fuel usage by unit is evaluated to help determine future usage requirements.
- 06 Heat Rate Analysis
Heat rate analysis for each unit is carried out for the varying qualities used.
- 07 Fuel Options Analysis
Based on availability and heat rate performance various fuel options are evaluated to determine the most cost effective fuel available.
- 08 Fuel Plan Projections
Based on data in the planning model, amounts and types of fuels required are scheduled.

b. Fuel Procurement

Functional capabilities are:

- 01 Vendor Analysis for Producers and Carriers
Vendor data is maintained to analyze fuel producer and carrier performance.
- 02 Fuel Contract Negotiation Analysis
Fuel contracts are analyzed for consistency and trends.
- 03 Vendor Performance Ratings
Data is maintained on the performance of vendors.
- 04 Fuel Purchase Order Generation
Purchase orders are generated and passed to the Materials Management System.
- 05 Fuel Purchase Order Follow-up and Analysis
Purchase orders for fuel are tracked and analyzed for comparison to contracts.

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- 06 Fuel Shipment Tracking
Fuel shipments are tracked to ensure on-time delivery.
 - 07 Fuel Receipt Analysis.
Fuel authorization and shipping weights are compared by contract and purchase order to actual shipments received.
 - 08 Fuel Receipt Purchase Order Posting
Fuel receipts are posted to the appropriate purchase orders.
 - 09 Fuel Quality Evaluation
Fuel received is graded for comparison with the quality ordered.
 - 10 Fuel Contract Premium or Penalty Clause Analysis
Premium and penalty clauses in contracts are analyzed to determine if premiums are due or penalties should be imposed.

c. Fuel Inventory Control

Functional capabilities are:

- 01 Fuel Availability Projections
Fuel availability is projected in increments of time by day, week, month or year.
- 02 Projected Burn Rates by Unit
The rate of burning is projected for each unit, in each plant, depending on projected demand, fuel availability, etc.
- 03 Projected Fuel Shortages
Shortages of various fuel types are projected depending on various circumstances.
- 04 Fuel Exception Reporting
Departures from projected fuel usage is reported.
- 05 Fuel Usage Reporting
Actual and planned usage of fuels is reported on a company-wide basis.

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- 06 Fuels on Hand
The fuel supply for each type of fuel is reported as of a given date.
- 07 Fuels Burned History
Historical fuel usage data is maintained for records and for fuel planning purposes.
- 08 Fuels Physical Inventory
Physical inventories of each fuel type at each storage location are recorded when taken.
- 09 Fuel Unit Costing
The cost per unit of fuel is calculated, allowing for all factors affecting that cost. Retroactive price adjustment factors are accumulated and allocated to fuel unit costs in the proper accounting periods bases on quantities purchased and burned.
- 10 Fuel Sampling Data
Data is collected on fuel samples and transmitted to Fuel Procurement for quality evaluation.

4. Materials Management Systems Group

The Materials Management Systems Group encompasses the total procurement, issue, and inventory control cycle. Interfaces are maintained with various parts of the Management Accounting, Construction Management, Maintenance Management, and Fuel Management Systems.

FORECASTING AND PLANNED REQUIREMENTS

Data is collected on the demand for stock items. Item analysis is performed. Reorder and transfer points and quantities are calculated. Inventory levels are monitored, and procurement procedures initiated. Projections are made of planned requirements, as opposed to recurring demand.

PURCHASING

Purchasing supports activities related to materials requisitioning, purchase ordering, receiving, and vendor performance rating. Several control activities are supported, such as tracing and monitoring dates.

MATERIALS INVENTORY CONTROL

Stores, inventory control, and accounting activities are supported. Activities required for receipts, transfers, and issues are monitored and controlled. Accurate stock status is maintained, which is used to conduct and reconcile physical inventories.

a. Forecasting and Planned Requirements

Functional Capabilities are:

- 01 Materials Requirement Collection
Data on materials required is collected by recurring and planned demand classifications.
- 02 Materials Statistical Forecasting
The recurring requirements data collected is used to assign an inventory model to each stock item.

- 03 Materials Planned Requirements
Project schedules and costs are estimated. Material availability and related procurement data such as prices and lead-times, are maintained.
- 04 Reorder and Transfer Point Calculation
The locations at which inventory must be replenished are calculated.
- 05 Order and Transfer Quantity Calculation
The replenishment quantities are calculated.
- 06 Material Control Decision Processing
Activities affecting stock and availability levels trigger an analysis of the available quantity versus the replenishment point.
- 07 Materials Analysis Reporting
Reports are generated on information contained in system data bases. These include: back-order and inventory analysis, service levels, slow moving and emergency stock, salvage, job availability analysis and status. Support is given to requirements for material that is serialized, such as turbine parts, meters, and other equipment.
- 08 Vendor Lead Time Measurement
The expected lead time for items is measured and reported by vendor.
- 09 Job Availability Simulation
The availability of items for scheduled jobs is simulated. The source of availability is indicated.

PURCHASING

Purchasing addresses the preparation of requisition and purchase orders, vendor evaluation and various tracking activities. Functional capabilities are:

- 01 Materials Requisitioning
Requisitions are prepared for items with a regular, recurring demand.
- 02 Generate Purchase Orders.
Purchase orders are generated for all requisitions.
- 03 Material Receipt Processing
Receipt transactions are generated for requisitioning area and processed against purchase orders when returned.

- 04 Generate Vendor Performance Reports
Standard rating guidelines for vendors are supported, such as time-lines, quality of material, accuracy of packing slips and invoices, and the number of tracers required.
- 05 Requisition Tracking
A tracer is put on unfilled requisitions after a reasonable amount of time.
- 06 Request for Quotation
Vendors are solicited for quotations on materials requirements. Responses are summarized and reported.
- 07 Blanket Purchase Order Processing.
Orders for materials which may be supplied without subsequent orders are supported.
- 08 Acknowledgement Tracking
Acknowledgements of vendor receipt of purchase orders are tracked, as required.
- 09 Delivery Date Tracking
Support is given for tracking and expediting shipments when delivery dates have been delayed.
- 10 Back-Order Control
Requisitions for out-of-stock materials are back-ordered and controlled.

b. Materials Inventory Control

Functional capabilities are:

- 01 Storeroom Configuration
This capability allows for independent storerooms, central warehouses, division storerooms, and satellite storerooms.
- 02 Materials Receiving
A materials receiving report is generated for all standard purchase orders. A request for returning materials is generated if it is unacceptable.

- 03 Materials Automatic Transfers
Materials may be designated for transfer between storerooms, depending on stock levels and forecast usage.
- 04 Materials Issues.
Issue tickets are posted.
- 05 Materials Salvage
Provision is made for returning materials from a job, and for removing materials from any physical site.
- 06 Materials Physical Inventories
Physical inventories are scheduled, based on stock number activity. Book and system balances are reconciled.
- 07 Stock Location
Each stock item is provided with primary and secondary location numbers, as required. All generated documents are sequenced by bin location.
- 08 Materials Replacement
Items are replaced by equivalent items, depending on quantity, date, or availability of the ordered item.
- 09 Materials Cancellations
Items are deleted from stock when they are no longer required or are replaced by another item.
- 10 Materials Catalog
The materials catalog is maintained with information pertaining to stock coded items.
- 11 Materials Unit of Measure
Provision is made for changing the unit of measure for an item.
- 12 Materials Activity Updates
Materials activity transactions are processed, producing daily, weekly, and monthly reports, as well as exception reports.
- 13 Accounting Distribution
Overhead and other non-chargeable items are computed for charging to the relevant accounts.

III. FUNCTIONAL DESIGN

C. Communications and Reporting System

The information flow matrix presented in the chart on the following page shows the functional organizations in the companies which create and use data in order to perform their respective job responsibilities and make decisions regarding operations, administration and planning for the company. These functional responsibilities are fundamental to the operation of the companies and will be required and exist as long as the companies remain in the energy business, as they are today. Using this approach to develop an information flow plan precludes the approach of linking the information flow plan directly to the companies organization chart. Organization charts will most likely change several times over the next few years as the companies evolve into the competitive environment. Regardless of how often the organization changes, this chart will hold valid as long as the functions of the company remain the same and can be translated to the organizational unit that is performing the functions at any point in time.

The chart reflects which function is responsible for the creation of data for the company and which functions will need to use that data in order to develop the necessary information to operate the company. Using this chart it will be evident where the flow of information will need to be directed.

The intent of the information systems architecture is to have fully integrated data bases so that all information is available to any user requiring the data in whatever formate is desirable. Using this approach avoids the necessity to produce volumes of paper and reports which often has the effect of discouraging people from properly using data. The intent is to have whatever data is needed in whatever format is required in order to satisfy the level of user that is looking for information.

A manager or organizational head usually wants to see summary reports that highlight the information needed to make decisions. Providing too much information in the wrong format will most likely discourage and confuse people from making effective management decisions. It is best to provide summary information and let the manager go to the next level down in the organization if they want and/or need more information. The systems data base will maintain the data at the lowest possible level of detail, and summarizing this as you move up the organizational structure will prove to be the most effective way to manage the companies. This approach avoids the problem of information overload and still allows all levels of detail to be available to anyone who wishes to access it.

Using this integrated systems data base approach will require that all systems contain a user friendly report generator module. This report generator will allow the user to quickly and

easily format reports to meet the user's need. All systems should contain standardized periodic (daily, weekly and/or monthly) reports that are produced to meet the majority of user needs for information contained in the systems. The users should define the format for these reports as they begin to use the data and will most likely modify the format as they become more familiar with the data and how they use it. The report generator would then be used to produce specialized reports that are need on a one-time basis or only occasionally.

Most financial reports should contain the specified numbers for the current period and the year-to-date. Often these numbers are compared to previous period and year-to-date numbers. Amount of change and percent of change are also commonly shown. Examples of financial statements according to IAS are shown in Tab A of Volume II of this report. Other reports such as expense analysis reports should be available by business unit, with summarizations rolling up to department, then division and finally for the entire company.

Genco headquarters would deal primarily with summary information from all their plants. If detail information is required they can either go back to each plant to inquire about the detail or access the data base and pull up the necessary data required to satisfy their needs. Here again, this approach will avoid the problem of information overload and will allow the headquarter managers to be more effective and efficient.

Most purchased packages today have a set of basic report formats that come with the system and are pre-defined. These report can be modified to suit the users needs and wishes, but would provide a basic starting point from which to build on report format needs.

As the companies evolve and become more knowledgeable and efficient in the competitive environment their reporting needs will also evolve and change, so it is important that whatever systems approach they choose to take has a flexible reporting structure. In all likelihood whatever they choose for a reporting format in the beginning will not be the one they will end up with three to five years from now.

With this reporting format approach in mind, the following information flow plan shows those functional areas of the company that will require reports in order to carry out their operations. These functional groups will need to define for themselves what they require for a report format.

Fossil Generation Companies Communications and Reporting System Information Flow Matrix

Functional Group	Systems												
	Financial Management	Cash Management	Accounts Payable	Accounts Receivable	Property Records	Payroll System	Personnel System	Fuel Planning	Fuel Procurement	Fuel Inventory	Materials Forecast and Planning	Purchasing	Materials Inventory Control
Investor Relations	U												
Corporate Planning	U					U	U		U	U			
Budget and Forecast	C/U	U				U	U			U			
Cash Management	U	C/U	U	U		U	U				U	U	
General Accounting	C/U	U	U	U	U	U				U			U
Payroll			C			C/U	U						
Accounts Payable			C/U		U			U				U	
Regulatory Information	U				U	U				U			U
Property Accounting					C/U						C/U		U
Billing				C/U									
Human Resources						C/U	C/U						
Fuel Management								C/U	C/U	C/U			C/U
Mat'l & Stores Inventory											C/U	C/U	C/U
Purchasing											U	C/U	C/U
Plant & Equip. Management							U	U					U
Construction Management					C/U		U						U

C = Creates Data

U = Uses Data