ALLOCATION GUIDES

INFORMATION SYSTEMS SPECIALIST CLASSES — Section 29

Introduction

This allocation guide supplements and clarifies the class specifications of the Information Systems Specialist (ISS) Series. It helps to identify the appropriate levels and aids consistent use of the classes across state agencies.

The ISS class series is comprised of eight very broad, generic classes. These classes are based on functional work areas and describe both general and specialized positions. Distinctions based on work environment are limited (e.g., mainframes, distributed systems, etc.).

Neither the class specifications nor this guide cover every possible combination of duties and responsibilities. Instead, they describe typical situations and identify factors to be considered when allocating positions.

Exceptions

Whether or not the job belongs in the ISS Series is the initial decision.

Knowledge of information technology is an increasingly important part of many occupational fields. Usually, however, the knowledge, skills, and methods associated with the program/subject matter area or support field remain primary. Information technology is a tool to facilitate doing the work in the program or subject matter specialty area. When deciding whether a position is properly allocated to the ISS Series, the primary purpose of the position is the overriding consideration and whether the requirement for specialized knowledge of information systems concepts, techniques, and practices is the paramount qualification for recruitment.

"Gray Area" positions

Many job classes (e.g., Office Support, Research or Management Analysts) now require considerable interaction with information systems technology. When assessing the appropriate allocation for these jobs, keep in mind which occupational area the job came from and from which occupational area the replacement will be recruited.

End user automation (application software development) is a good example of how information systems staff and program/subject matter staff work together.

Information Systems staff:
- help define processing requirements;
- advise on the selection of hardware and software;
- advise on (or design and develop) software selections;
- develop individual or distributed data base systems;
- design networks and prepare operating specifications;
- select modems and operating protocols;
- coordinate with other IS staff, vendors, contractors, etc.;
- train user staff to use the application.

Program/subject matter personnel:
- define the processes to be automated;
- review applications software;
- operate systems to achieve program goals.

Once the application is developed, the program/subject matter staff continue to work in the program area to produce or monitor the product while the ISS staff move on to another development assignment.

When deciding whether a position should be allocated to the ISS series, carefully consider the following questions:

1. Does the position use the computer or run the computer (i.e., control the applications, jobs and data flow)?
2. Does the position use the application or design/modify the application?
3. Does the position describe the business needs or define the business application?
4. Does the position troubleshoot the output or troubleshoot the processes?
5. Does the position require programming language? (i.e., COBOL, C, Object Oriented, SQL, JCL)
6. What are the essential program/subject matter knowledge and skills?/What are the essential IS technology knowledge and skills?

Note: For questions 1-4, second response indicates Information Systems oriented jobs.

Tools

If the job meets the criteria for the ISS series, the next step is identifying the correct allocation level within the series.

The ISS series is used in conjunction with the Information Systems (IS) Primary and Supplemental Dictionary, and the Job Profile Document. The **Primary Dictionary** describes the ***types*** of work (duties) and the **Supplemental Dictionary** describes the ***levels*** of the work (complexity of those duties). Appendix E is a Glossary of terms to further clarify the classes and this guide.

1. The Dictionary (*Appendix A*)

The Dictionary serves several purposes. First, it gives us a common language to describe and allocate jobs. Second, it is a tool to aid consistency across agencies. It is only a tool, however, and correct allocation to the series still requires critical analysis and judgment.

The Dictionary also provides:
- a tool for profiling current job duties;
- a management tool for structuring jobs;
- a road map for employees to use in managing their careers;
- a means to identify training needs within an organization.

Primary Dictionary

The first page of the dictionary is the Primary Dictionary. It describes the various types of work, by functions, on a matrix.

There are four **Infrastructure Functions** (on the horizontal axis).

- **Communications** means the connections that link systems and includes voice, data, image, and video.
- **Software** means the programs, procedures, rules, and associated documentation concerned with operating a system and covers both applications and operating software.
- **Hardware** means the physical components (i.e., PC, server, mainframe, peripherals, etc.).
- **Data** means data bases and associated master files.

The four **Organizational Functions** (the vertical axis) have specific definitions. They were specifically developed as part of this study. While they may not match your current terminology, you must use them to correctly apply the Dictionary.

- **Customer Assistance** means to help use and fix the infrastructure functions. This covers help desks and training in addition to dealing with problems of all sizes, including system crashes. Maintenance fixes are also included here.
- **Operations** means the day-to-day activities and includes such things as installation, performance monitoring, access, daily security, back-up, scheduling, inventory management, and processing orders.
- **Construction** means designing and implementing new systems or features and also includes major remodels or enhancements.
- **Planning** means strategic planning. This is not the every day planning that is part of getting the job done required of many positions. It also does not mean providing information, making recommendations or conducting studies for the planners. This is long range planning that affects the future direction of the organization. For allocation purposes, strategic planning is a separate, primary function of the job.

Each cell on the Primary Dictionary describes specific duties that define the intersection of that Infrastructure Function - Software, Hardware, etc. (column) and Organizational Function - Customer Assistance, Construction, etc. (row). Using this tool we will all mean the same thing when we say "This job works 50% of the time in Software Customer Assistance."

The work is described in very general terms. For instance, “program development” under Software Construction, includes typical programming tasks such as writing, coding, testing, and debugging programs. Related tasks are also part of Software Operation (e.g., modifying new software installations for version compatibility) and Software Customer Assistance (in relation to maintenance or fixing software problems).

Each intersection (cell) on the Primary Dictionary matrix is not a job description, but simply a cluster of duties or work. Most jobs encompass more than one cell. It would be very unusual for a job to be described completely by the work in a single cell.

These cells are the building blocks for jobs. There may be a Generalist who does Customer Assistance across all four Infrastructure Functions (Communications, Software, Hardware, and Data), or a hardware specialist who does all four Organizational Functions (Customer Assistance, Operations, Construction, and Planning) but only related to hardware. There could be a strategic planner who is an expert in Hardware and Communications, so the job would only fall into those two cells but possibly at higher complexity levels. The point is, these are building blocks that allow you to profile each individual position in terms of the duties and complexity of those duties.

Supplemental Dictionary

The following pages of the Dictionary describe complexity levels. Each of the duties on the Primary Dictionary get more complicated at some point. Identifying what causes the work to be more complicated and at what point the work crosses over to a discernible difference in complexity is the challenge. The Supplemental Dictionary describes these change points.

There is a separate dictionary for each Infrastructure Function (Communications, Software, Hardware, and Data). The cells on each Supplemental Dictionary contain examples of the factors that characterize the differences in complexity. These should help you get a better understanding of the complexity being described.

Some factors considered are:

- available guidelines; sources of help
- change in the technology environment
- amount of variety with which the position must deal
- amount the work produced affects others

Again, these are not job levels. They are complexity levels for the duties in each cell. Think of each task in the cell, what makes it more complicated and what level of complication the job must handle. This makes it easier to focus on the complexity level for each cell. There could be several complexity levels within any job.

The Organizational Functions as they relate to the Infrastructure Function of a particular cell define the context of the work. To help relate the complexity levels back to the work assignments, the cell contents from the Primary Dictionary are duplicated in the far left column of each Supplemental Dictionary.

One very important note: Complexity levels do not correlate across functions. They relate only to the specific organizational function. For example, Complexity Level 1 for Construction does not correlate to Complexity Level 1 for Operations; the first complexity level for Customer Assistance does not equate in any way to the first complexity level for Planning. Each function is dealt with separately, and the factors and thresholds are unique. The individual duties, the factors that affect those duties, and how much those factors must change to really make the job more complicated are the basis for complexity levels.

Also, the complexity levels are cumulative. A position working at the highest complexity levels can do lower level work as well. The dictionaries identify those factors that make one complexity level different from the next highest level.

As you work with this Dictionary, please remember that it describes the universe of state government. The highest level of complexity describes the most complex information systems situations for all State agencies. You must consider your position's complexity level within that context. From a statewide perspective, every agency will not have jobs that involve work at the highest complexity levels.

2. Job Profile Document *(Appendix B)*

The Job Profile Document is another tool to help you analyze IS jobs for correct allocation to the ISS classification series. The Job Profile Document is simply a blank Primary Dictionary matrix (without the duties). The cells now have a place to record job related information, both the percentage of time that a position spends on the duties specific to that cell and also the complexity level of the work within that cell.

3. Summary Chart *(Appendix C)*

Once you become familiar with the class specifications and the dictionary descriptions of duties and complexities at the various levels, the Summary Chart offers a quick way to identify approximate allocation levels. The Summary Chart summarizes typical Organizational Functions done by Specialist and Generalist positions at each level of the series and the key differences between levels based on those Organizational Functions. For more detail on using the Summary Chart, see the Allocation section.

Job Profile Process

As with all job allocation, you need a thorough understanding of the type and level of work required of the position. A clear, accurate, and up-to-date Position Description (PD) is foremost. The PD should not copy the cell information. It is not specific enough to actually describe work assignments. For this process, it is important that the PD indicate the percentage of time spent on individual duties. You may need additional discussion with the Supervisor or a desk audit to get all the information you need.

Once you have a clear description of the duties for an individual position and the complexity of those duties, plot them on the Job Profile document. This is generally a two step process. First, decide which cells on the Primary Dictionary describe the job duties and write in the percentage of time spent on those duties. Then, decide the complexity levels of those cells from the Supplemental Dictionary.

Step 1: Type of Work

First, use the Primary Dictionary to decide the type of work done. Look for types of work in the duty statements of the PD and then find the cell that describes that work. Don't rely on your agency's definition of functions since they may be different from the Dictionary. The Dictionary definitions are key. Please see the Dictionary Components section above for more detail about the Primary Dictionary.

Concentrate on the majority of the work and don't worry about incidental tasks. Miscellaneous duties are not part of the class specifications. The cell information is for allocation, not writing position descriptions. Class specifications deliberately lack the detail of a position description. Remember, in this class series, 70% of the total job functions are the basis for describing both the Specialist and Generalist jobs. Also, be sure to look at what the position's duties require, not what the incumbent can do.

Don't try to put a position in one cell. Most jobs cover more than one cell. Generalists may cover several cells at a lower complexity. Equivalent Specialists may cover fewer cells at a deeper complexity.

Individual duty statements on the PD may describe tasks that fall into different cells on the Primary Dictionary. For instance, a statement about installations may cover 2 or 3 Infrastructure functions (communications, hardware, and software). You may need to make a judgment call or clarify further with the Supervisor on the actual percent of time spent on installations in each particular infrastructure function.

Some duties may show up in more than one cell on the Primary Dictionary. For instance, “performance monitoring” falls under Operations and also under Planning. Remember, the context of the Organizational Function defines the work. Operations covers the day-to-day framework while Planning relates to long term strategies. “Performance monitoring” has different meaning within these two different organizational functions. If it is unclear which cell the duty correctly fits, clarify this with the supervisor or manager (or the employee, with management's confirmation).

Some positions may be difficult to classify because of the project nature of the work. Teams made up of program staff, line managers, and information systems specialists and generalists frequently carry out the automation process. The duties and responsibilities assigned to a particular position typically change between stages of a project and from one project to the next. Therefore, when classifying positions, the focus should be on the most representative level of work done over time.

Step 2: Complexity Level

Once you've plotted the duties of the job and the percentage of time spent in that area on the Job Profile document, the next step is to decide the Complexity level. The Supplemental Dictionary describes the Complexity Levels. There is a separate Dictionary for each of the Infrastructure Functions (i.e., one each for Communications, Software, Hardware, and Data). Please see “The Dictionary” section above for more detail about the Supplemental Dictionary.

A variety of elements (e.g., the size, scope and criticality of the environment, diversity of systems, available guidelines, etc.) influence the complexity levels. The levels encompass the universe of jobs within all of state government. You must consider the complexity level of the job being classified within that context.

For example, there are information systems employees within various state agencies who are responsible for network administration and support. Some of these employees are responsible for a relatively small, established network, usually in a single building. They primarily support vendor supplied software where major network modifications are infrequent.

Others administer networks requiring on-going planning and modifications to maintain optimum network performance. These employees have primary administrative responsibility for networks at several work sites. They are supporting custom applications as well as vendor supplied software and may have more than one operating system or data transport protocol. There is frequent need for network reconfiguration.

Still others are responsible for maintaining communications among networks established to allow statewide (or nationwide) access to applications. These employees plan, design, and reconfigure networks and select and install equipment. They function as communication coordinators on a department wide basis for departments with extensive network requirements. All of these jobs carry out similar functions to maintain the organization's network, but there are significant differences in the complexity of the jobs.

The complexity levels require careful attention. They can easily be over-rated if the factors are not considered in terms of the overall work of the State. All systems are critical to an agency to accomplish its work. Down time for some systems, however, is less critical from a statewide perspective than one where external entities rely on information from that data for public safety, or where federal time mandates must be met.

In deciding the appropriate complexity level, keep in mind that each higher level is cumulative of the lower levels (e.g., complexity level 2 would be able to do any of the complexity level 1 work). **REMEMBER** that to be placed at a specific complexity level, the position must be working at that level the majority of the time **AND** most, if not all, of the descriptors must apply to the work.

It is also important to consider each job individually. Even though an organization's overall environment may be highly complex, not every position in the organization works at the highest complexity levels. There are beginning level analysts who are guided in their work by those working at higher complexity levels. There are first line user support staff typically dealing with “off the shelf” software and hardware problems for individual work units. And there are high level specialists who design new applications for new business processes.

Database systems are a good example of differing complexity levels. Less complex data systems are most often single user systems, typically written in Access, Paradox, Foxpro, etc. These are generally designed as an end user application program. Disk management is not required until the physical file becomes too large and security is done at the file level. With these systems no special backup or recovery processes or system tuning are involved for the most part.

The more complex levels are those systems written in a data base product such as Oracle, Sybase, or DB II that support large numbers of concurrent users and large volumes of data. Tuning, both at the system and database level, is critical. Backup and restore of data files to reduce disk fragmentation may be necessary. These systems require careful disk management and planning for optimum performance.

All database systems require analysis and normalization of data elements but it is far more critical in large, multi-user systems.

Don't confuse "more" with "more complex" for allocation purposes. Adding applications software doesn't necessarily make a system more complex. The addition may increase the user training required and the number of problems to troubleshoot, but the position still does essentially the same tasks. Similarly, “new” features or technology may initially require some specific training and a period of time to learn how to work with them, yet the jobs may be basically unchanged. This is true in many jobs. For example, using new tools doesn't change the basic tasks a carpenter must do to build a room.

Allocation

To make an allocation decision, analyze the Job Profile Document to decide the main focus of the job. Start by adding the percentage of time spent in each Infrastructure Function (columns) and across the Organizational Functions (rows). This will help you decide whether the position works as a Specialist or a Generalist and the Organizational Functions in which the work concentrates.

Look at where the position is spending 70% of the time. Start with the infrastructure functions with the highest percentages of time and add those until you reach 70% or more of the time. From that analysis, decide whether the job is a Specialist or a Generalist (i.e., how many Infrastructure Functions account for 70% of the position's work).

Generalists and Specialists

The Infrastructure functions (those along the horizontal axis of the Primary Dictionary) distinguish between "Specialist" and "Generalist". The Specialties are Communications, Software, Hardware, or Data. For example, a Specialist in Software (one Infrastructure Function) may be doing duties that fall into multiple Organizational Functions, (e.g., Customer Assistance, Operations and Construction).

On the other hand, the Generalist works across Infrastructure Functions (i.e., Communications, Software, Hardware, and Data), but may work in only one or two of the Organizational Functions.

There's a breadth vs. depth of knowledge trade-off (i.e., how much you know [depth] about how many things [breadth]). The Specialist knows a lot about a specialized area (Infrastructure), while the Generalist knows something about several specialized areas (Infrastructures).

A **Specialist** works 70% of the time in **one or two** infrastructure functions (Communications, Software, Hardware, or Data) . The **Generalist** works 70% of the time in **three or four** infrastructure functions.

Next decide which Organizational Functions account for 70% of the job's activities. The Job Profile Document will help you identify the Organizational Functions in which the work concentrates. The class specifications describe specific tasks in more detail and will help you verify these decisions.

Then, decide at which Complexity Level the position works within the various functions. Refer to the Dictionary and the Class Specifications for more in-depth descriptions of the levels.

Finally, summarize your analysis. For example, a Generalist performs Customer Assistance at Level 2, and Construction at Level 2. Decide whether this is an accurate description of the job. If not, go back to the Job Profile Document and reassess the duties and complexity levels.

Summary Chart (*Appendix C*)

If the analysis seems reasonable, compare your summary of the Job Profile Document to

components of the job levels on the Summary Chart and select the appropriate level. The Summary Chart summarizes typical Organizational Functions done by Specialist and Generalist positions at each level of the series (Column 2) and the key differences between levels based on those Organizational Functions (Column 3). Use the Distinguishing Features (Column 3) to guide the choice. The key differences should match the most important components of your position.

Guideposts *(Appendix D*)

To further assist with allocation consistency, please refer to Appendix D, ISS Series Guideposts. These Guideposts are based on actual positions. The key job components and the environment in which the work is done are described on the front page of each job example. A completed Job Profile Document, the allocation decision and the reasons for the allocation are shown on the back.

ORGANIZATIONAL FUNCTION	INFRASTRUCTURE FUNCTION			
	COMMUNICATIONS (voice, data, image and video)	**SOFTWARE (operating and applications)**	**HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)**	**DATA**
CUSTOMER ASSISTANCE (help use and fix)	· diagnose user problems · coordinate solutions · track and report problems · user training on network access/use	· diagnose user problems · user questions · coordinate solutions · track and report problems · test new features · user training on specific software and reporting tools	· diagnose user problems · user questions · equipment problems · coordinate solutions · track and report problems · training on use of hardware · disaster recovery · repair and replacement	· data analysis · user ad-hoc reporting · user support areas · reports/extract information
OPERATIONS (day-to-day)	· access · security · installation · traffic control/scheduling · work orders (add/change/move) · back-ups/library · recovery-restart · version control · version compatibility	· installation · version compatibility · version control · system performance · security - OS & Applications	· inventory management · installation · high volume report production · high volume report distribution · order processing · security - Site/physical	· data protection · version control · version compatibility · data quality control · back-up · data base performance monitoring, tuning
CONSTRUCTION (new)	· business analysis/research · needs assessments · business process modeling · architecture · design framework of communication system · implementation · vendor contracts/mgmt · compatibility · pathways/linkages	· business analysis/research · needs assessment · business process modeling · documentation · architecture · program development · evaluate vendor software · modify software · interfaces · vendor contracts/mgmt	· business analysis/research · evaluate and recommend options · negotiate with vendors · vendor contracts/mgmt	· business analysis/research · design & create · modeling data · documentation · vendor contracts/mgmt · inventory - data dictionary
PLANNING (strategic)	· resource utilization · disaster planning · traffic volume-system performance · acquisition strategy · new technologies · wiring standards · communications software standards · compatibility · security · cost benefit analysis	· resource utilization · disaster planning · change control management · evaluate new products · new technologies · compatibility · security · cost benefit analysis	· resource utilization · disaster planning · new technologies · acquisition planning · volume/capacity plan · system features-attributes · configuration · compatibility · security · cost benefit analysis · performance analysis	· enterprise modeling · data storage · change control management · security · compatibility · disaster planning · volume/capacity · data base performance monitoring · resource utilization · cost benefit analysis

INFORMATION SYSTEMS DICTIONARY – SUPPLEMENTAL

ORGANIZATIONAL FUNCTION	COMMUNICATIONS (voice, data, image and video)			
	COMPLEXITY LEVEL 1	**COMPLEXITY LEVEL 2**	**COMPLEXITY LEVEL 3**	**COMPLEXITY LEVEL 4**
CUSTOMER ASSISTANCE (help use and fix) · diagnose user problems · coordinate solutions · track and report problems · user training on network access/use	· Work over phone · Identify system and problem · Know usual responses · Straight forward - follows script - 'canned' answers to most commonly asked questions · Processes in place · Basic investigation · Operational assistance (e.g., helps user with passwords, keystrokes, network download, print queues , new software packages) · De-/insert card in hub · Simple, 'plug-in' replacements · Has back-up (Sr.) staff for advice · Low impact user problems · Isolated incidents · Focused view on specific question	· On-site evaluation or lengthy phone/dial-in diagnosis · Initiates emergency trouble calls to vendors · Resolves most Server-to-Desktop connectivity issues. · Prioritize problems · Conflict resolution · Reload Router · Replacement - evaluate situation and determine part(s) required · Configures client software, i.e. ODBC drivers, E-Mail access, protocol adapters, Fax/OCR/WP integration, host emulation software · More independent - less backup · Recurring or widespread problems · Broader View. Considers implications of questions.	· 'Last Resort' - must solve all outstanding user connectivity problems · Initiates software defect trouble calls to vendors · Multiple jurisdictions involved · High impact in terms of - Number of people affected - Revenue lost · Major state system impact · Research of problems is required · No established solutions · Establishes procedures used by levels 1 & 2 · Trains other staff · Acts independently	
OPERATIONS (day-to-day) · access · security · installation · traffic control/scheduling · work orders (add/change/move) · back-ups/library · recovery-restart · version control · version compatibility	· Works under guidance · Access: - standard, routine processes - adds E-Mail clients · Security - Processes forms · Installations following instructions · monitors software licenses · Has/Uses Documentation · Daily Traffic issues (Watch and recognize) · Troubleshoots local LAN - Server backup/restore - print queue management - configure local mail hub - resource utilization · Network, System Mgmt, and RMON software all from a single vendor	· Minimal Supervision · Access/Security - New or Unique changes (i.e. vendor dial-in) · Does Initial Installations (includes configuration, testing, troubleshooting) · Does Documentation · Traffic/Volume control - Recognizes trends and finds out why · Tuning according to documented instructions · Version Control · Troubleshoots single WAN or multiple local LANs · Network, System Mgmt and RMON from multiple vendors but very tightly integrated · Single organization · Single Server OS and NOS Network tuning according to documented instructions	· Multiple jurisdictions/ organizations · Multiple WANS · Multiple Server OS · Multiple NOS · Works very independently - Recommends changes - Considers costs, timing and other factors · Sets priorities · Prototype Installation (plan & schedule) · Version control - global picture · High impact changes/installations · Network, System Mgmt and RMON from multiple vendors; no integration; some Agency extensions · Creative network tuning · Acts independently	

INFORMATION SYSTEMS DICTIONARY - SUPPLEMENTAL

ORGANIZATIONAL FUNCTION	COMMUNICATIONS (voice, data, image and video)			
	COMPLEXITY LEVEL 1	**COMPLEXITY LEVEL 2**	**COMPLEXITY LEVEL 3**	**COMPLEXITY LEVEL 4**
CONSTRUCTION (new) · business analysis/research · needs assessments · business process modeling · architecture · design framework of communication system · implementation · vendor contracts/mgmt · compatibility · pathways/linkages	· Assessment: does initial information gathering. Works on lower impact studies · Common projects, (e.g., new drop, new Server releases) · Known construction (no modeling) · Implements part of a plan that's already established (uses checklist) · As member of team installs - new DBMS release - new Server OS - system Mgmt agents - local Network Directory · Highly Standardized environment (e.g., mostly Token Rings, mostly Ethernet, or Network, System Mgmt, and RMON software all from a single vendor) · Works with vendors · Closely Supervised - guided by precedents	· Business Analysis · Introduces technology new to the agency · Bigger or less common projects (e.g., new floor subnet, installs network directory; Firewall software; Hub Server and DBMS; Gateway; and router/hub software releases) · Build implementation plan - Usually one vendor only - Negotiates cross-agency cooperation · Varied environment - mixed devices Assesses minor compatibilities (e.g., Building wiring - Can the connectors handle hooking token ring to Ethernet, with minor adjustments). · Chooses vendors from existing contracts · Acts independently	· Business process modeling · Introduces innovative technology to the State · Big or unusual projects (e.g., WAN, installs that require solving problems new to Agency) · Build implementation plan - Multiple Vendors - Cross agencies - Multiple Jurisdictions · Significant compatibility issues on major projects. (e.g., Token Ring to Fast Ethernet. Will wiring work? Can the network handle it?) · Codes extensions to System Mgmt/ Network software; Firewall software; and Enterprise DBMS software · Sets specifications for bids and chooses vendor	
PLANNING (strategic) · resource utilization · disaster planning · traffic volume-system performance · acquisition strategy · new technologies · wiring standards · communications software standards · compatibility · security · cost benefit analysis	· Acquisition Strategy · Test new software releases - Server OS - Server program products · Client packages · Technology new to agency/ division · Security standards for agency · Disaster Recovery = redundant systems - How long can it be down? · Impact - Variety or complexity of technology being planned for - Who does it affect · Single vendor solution to most issues suffices · Write single-site project plan for small, homogeneous project team	· Select, test with existing systems, and evaluate for adoption: -Server program products - Client packages: · Technology new to state · Public impact if communications exceed capacity · Security - Public Access - Dial in · Write multi-site project plan for project team with varied skills · Single vendor solution to system issues (OS, protocol, mail, DBMS); but multi-vendor integration of program products needed	· Select, test with existing systems, and evaluate for adoption: -OS, NOS -protocols, Gateways -systems mgmt software · Technology new to industry · Security - Internet · Multi-vendor system integration solutions needed - multiple vendor OS/NOS - multiple protocols - multiple mail transports - multiple DBMS vendors · write multi-site, multi-platform project plan for heterogeneous project team	

INFORMATION SYSTEMS DICTIONARY - SUPPLEMENTAL

ORGANIZATIONAL FUNCTION	SOFTWARE (operating and applications)			
	COMPLEXITY LEVEL 1	**COMPLEXITY LEVEL 2**	**COMPLEXITY LEVEL 3**	**COMPLEXITY LEVEL 4**
CUSTOMER ASSISTANCE (help use and fix) · diagnose user problems · user questions · coordinate solutions · track and report problems · test new features · user training on specific software and reporting tools	· Common user questions from internal employees · Narrow scope or isolated incidents · Standardized environment · Resolves problem by explaining how to use software · Informal Training - one-on-one · Test new features	· New/Unique error messages · Problems affect the entire agency · Variety of Applications & Operating Systems · Resolves problem by fixing software · Conduct formal training (classroom, certification)	· System crash · Problems affect all State agencies · Criticality of system - Time critical system - Revenue being tracked or lost - Regulatory requirements not being met - Public safety issues involved · Develop & prepare formal training (classroom, certification)	
OPERATIONS (day-to-day) · installation · version compatibility · version control · system performance	· Install established software · Precedents available · Standardized environment w/few version issues · Complexity of S/W and its impact on users - no/little impact on other software · Monitor work load and work flow (scheduling, resource use) - Recognize problems - Basic diagnostics	· Install software/technology new to agency · Modifying software to make versions compatible · Software impacts other software - Coordinate changes with other systems./users · Analyze work load and work flow (scheduling, resource use) - Analyze performance - Resolve problems - Contact vendors regarding problems	· Installing software/technology new to industry - Coordination and implementation is complex - Major impact to other systems · Multiple sites/branches - distributed needs within agency. - wide dispersal · Multiple agencies/entities in work flow - performance problems affect multiple vendors/agencies - coordinate solutions - resolve resource competition issues	

INFORMATION SYSTEMS DICTIONARY - SUPPLEMENTAL

ORGANIZATIONAL FUNCTION	SOFTWARE (operating and applications)			
	COMPLEXITY LEVEL 1	**COMPLEXITY LEVEL 2**	**COMPLEXITY LEVEL 3**	**COMPLEXITY LEVEL 4**
CONSTRUCTION (new) · business analysis/research · needs assessment · business process modeling · documentation · architecture · program development · evaluate vendor software · modify software · interfaces · vendor contracts/mgmt	· Automating a current business process · Small or established project with standards and precedents · Sections of large system · Minimal coordination; works with single user group · No or few version/compatibility considerations · Interfaces: - Similar users - Established security · Similar hardware · Questions to Vendors · Business is static or slow to change	· Automating a new business process · Broader Section on Large Systems · Coordinates (Not much dissention) · Version compatibility issues - consider & identify · Assess performance issues for current project · Interfaces: - Variety of users - Security changes - Dial in users · Variety of hardware · Evaluate vendors (more options) · Business has moderate level of change	· Changing/re-engineering a business process · Unusual/New Businesses · No agency precedents · System Architect · High level of coordination · Conflicting needs/conflicting resolutions · Version Problems · Integrate new versions/new software · Performance of overall system · Interfaces: - Communication with outside parties, companies, fed, county, agencies - Send and exchange information · Wide variety of hardware · Security Issues · Select from multiple vendors · Recommendations including cost, performance factors · Dynamic business - rapid change	
PLANNING (Strategic) · resource utilization · disaster planning · change control management · evaluate new products · new technologies · compatibility · security · cost benefit analysis	· Standardized environment · Similar users and hardware · Security - internal users · Disaster Planning - stand-alone system (no dependencies) · Evaluation of products new to agency	· Variety of applications and operating systems · Variety of users and hardware · Security - external users (other agencies) - interaction with other software and hardware · Disaster Planning - legal mandates for processing - other entities relying on your operations · Evaluation of products new to the state or industry	· Distributed needs within agency · Multiple agencies in work flow · Competition for resources · Communication with outside parties, companies, fed, county, agencies - Send and exchange information · Security - public access - dial-in access · Evaluation of new approaches and new directions	· Need for integrating multiple systems from multiple organizations (State, County, Federal, private) · Select; test with existing systems; evaluate for adoption: technology new to industry · Write inter-governmental, multi-platform project plan for multiple heterogeneous project teams

INFORMATION SYSTEMS DICTIONARY - SUPPLEMENTAL

ORGANIZATIONAL FUNCTION	HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)			
	COMPLEXITY LEVEL 1	**COMPLEXITY LEVEL 2**	**COMPLEXITY LEVEL 3**	**COMPLEXITY LEVEL 4**
CUSTOMER ASSISTANCE (help use and fix) · diagnose user problems · user questions · equipment problems · coordinate solutions · track and report problems · training on use of hardware · disaster recovery · repair and replacement	· Areas of Responsibility: - Do on the phone - Basic Diagnostic - Eliminate Possibilities - Determine who gets Referral - Start Documentation - Use history to assess problem - Simple, 'plug-in' replacements · Product Mix: - One Building/location - Highly standardized - Established system/minimal expansion	· Areas of Responsibility: - On-site Evaluation - Analyze error codes/diagnostic messages - trace/analysis tools - physical repair - Vendor contacts (questions) - External contacts (Vendors, phone companies., etc.) - Conduct training (on Hardware) - Replace cards · Product Mix: - Remote location + no established backbone + create the connections (responsible for Communication Hardware) - Mixed Environment (Multiple Standards) - Moderate Expansion/Change	· Areas of Responsibility: - Physical repair - soldering, cabling - Multiple Vendor Issues - Coordinate problem solving with other IS Staff · Product Mix: - Multiple Remote locations - Mixed Environment - Massive expansion/change · Customer base includes multiple jurisdictions - support their HW	
OPERATIONS (day-to-day) · inventory management · installation · high volume report production · high volume report distribution · order processing	· Product Mix: - One Building/location - Highly standardized - Established system/minimal expansion · Simple memory upgrades · Order Processing - on contract - direct replacement	· Product Mix: - Remote location + no established backbone + create connection (responsible for Communication Hardware) - Mixed Environment (Multiple Standards) - Moderate Expansion/Change · Major Upgrades (e.g., 486 to Pentium) · Order Processing - Request for Proposal - new item not on contract	· Product Mix: - Multiple Remote locations - Mixed Environment - Massive expansion/change · System Upgrades and migrations · Order Processing - Request for Proposal - new item not on contract · Customer base includes multiple jurisdictions - support their HW	

INFORMATION SYSTEMS DICTIONARY - SUPPLEMENTAL

ORGANIZATIONAL FUNCTION	HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)			
	COMPLEXITY LEVEL 1	**COMPLEXITY LEVEL 2**	**COMPLEXITY LEVEL 3**	**COMPLEXITY LEVEL 4**
CONSTRUCTION (new) · business analysis/research · evaluate and recommend options · negotiate with vendors · vendor contracts/mgmt	· Product Mix: - One Building/location - Highly standardized - Established system/minimal expansion · Simple memory upgrades	· Product Mix: - Remote location + no established backbone + create connection (responsible for Communication Hardware) - Mixed Environment (Multiple Standards) - Moderate Expansion/Change · Major Upgrades (e.g., 486 to Pentium) · Multiple vendors	· Product Mix: - Multiple Remote locations - Mixed Environment - Massive expansion/change · System Upgrades and migrations · Customer base includes multiple jurisdictions - consider their HW	
PLANNING (Strategic) · resource utilization · disaster planning · new technologies · acquisition planning · volume/capacity plan · system features-attributes · configuration · compatibility · security · cost benefit analysis · performance analysis	· Product Mix: - One Building/location - Highly standardized - Established system/minimal expansion · Test new HW releases	· Product Mix: - Remote location + no established backbone + create connection (responsible for Communication Hardware) - Mixed Environment (Multiple Standards) - Moderate Expansion/Change	· Product Mix: - Multiple Remote locations - Mixed Environment - Massive expansion/change · Customer base includes multiple jurisdictions - plan for their HW	

INFORMATION SYSTEMS DICTIONARY - SUPPLEMENTAL

ORGANIZATIONAL FUNCTION	DATA			
	COMPLEXITY LEVEL 1	**COMPLEXITY LEVEL 2**	**COMPLEXITY LEVEL 3**	**COMPLEXITY LEVEL 4**
CUSTOMER ASSISTANCE (help use and fix) · data analysis · user ad-hoc reporting · user support areas · reports/extract information	· Work over Phone · Common user questions from internal employees · Performs problem analysis, troubleshooting · Single environment ·Tests features	· Problem referral from IS staff, not direct user contact · Problems affect entire agency · Training users, formal and informal · Contact vendor to solve problems · Mixed environment · Sharing data with other entities	· Problems affecting State · Conflict resolution · Mission critical problems /data · Mixed environment of data base management systems · Distributed data	
OPERATIONS (day-to-day) · data protection · version control · version compatibility · data quality control · back-up · data base performance monitoring, tuning	· Single Data base (central) · Security covered by other operational functions · Internal Users with Limited Access · Program Control (Database takes anything program sends it) · Timed back up of entire file. · Monitors, identifies performance problems and issues.	· Multiple Data bases (central) - Not distributed-no need to interact. · Security covered by other operational functions · Internal Power Users - Strong Tools · Database definitions and program Control - Conflicting Instructions - DB defines values/compatibility with other programs - Maintain data dictionary · journalize - track changes (who, what) - Detailed Recovery · Diagnose and Tune Problems/ Issues · Manages physical storage	· Relational Databases as well as VSAM File - Distributed Databases - Multiple Databases · Data Level Security · External Users (Feds, Counties) w/update access · Relational Integrity - Constraints - Linked Tables - Consistency · Redundant system - Fault Tolerant · Makes recommendations on performance tuning, considering - cost - specifications - organization policies on expansion	

INFORMATION SYSTEMS DICTIONARY - SUPPLEMENTAL

ORGANIZATIONAL FUNCTION	DATA			
	COMPLEXITY LEVEL 1	**COMPLEXITY LEVEL 2**	**COMPLEXITY LEVEL 3**	**COMPLEXITY LEVEL 4**
CONSTRUCTION (new) · business analysis/research · design & create · modeling data · documentation · vendor contracts/mgmt · inventory - data dictionary	· Uses established standards for database questions · Single table at a time - Build tables separately and then tie together (maybe) · Contact vendors to ask questions · Use in-house consultants	· Establishes standards and precedents · Plans a set of tables for an application · Decides which data goes in which table · Uses data dictionary · Contact vendors to ask questions	· Major change in Technology - (new technology to Agency) · Logical Design (model) - Uses a Tool Set for modeling standards - Interested in data elements between different tables · Distributed data - read only · "Normalizing" data · Updates the data dictionary · Interprets/enforces documentation for dictionary · Vendors: Interpret/research	· New technology to the State · Decides what tools to use - Sets data standards - Consensus decision authority - Metadata (dictionary) - Approves design changes - Sets documentation policies & procedures - Vendor selection/assessment - RFP writing, evaluation · Distributed data - remote input & manipulation · Mixed environment of database management systems
PLANNING (Strategic) · enterprise modeling · data storage · change control management · security · compatibility · disaster planning · volume/capacity · data base performance monitoring · resource utilization · cost benefit analysis	· Apply data base management standards · Evaluate & recommend DBMS software and system support tools · Monitor data usage and determine maintenance requirements · Media management - Apply resource allocation standards	· Monitor and tune performance · Implement data security measures · Identify opportunities where the data resource could provide better benefit to the organization · Broad business perspective · Conceptual and logical data modeling · Enterprise modeling evaluate & recommend new platforms, DBMS, application systems and utilities	· Establish & enforce metadata standards · Decide issues of data sharing, location, usage, security, integrity, flexibility · Recommend changes in business operations to better exploit the data resource · Review & approve logical data models and physical design standards · Select DBMS tools · conduct training in modeling and design · Decide resource allocation · Verification of data integrity	

APPENDIX B

INFORMATION SYSTEMS SPECIALIST CLASSIFICATION SERIES
SUMMARY OF DISTINCTIONS BETWEEN LEVELS

This chart summarizes typical components (i.e., Organizational Functions) for Specialist and Generalist positions at each level of the series (Column 1) and the Key Differences between levels based on those Organizational Functions (Column 2). Please see the Allocation Guide for more detailed explanation.

LEVEL	COMPONENTS	DISTINGUISHING FEATURES (i.e., what makes the job level higher)
IS 1	**SPECIALIST** Customer Assistance, Operations-Complexity 1 **GENERALIST** Customer Assistance-Complexity 1	
IS 2	**SPECIALIST** Customer Assistance, Operations, Construction-- Complexity 1 **GENERALIST** Customer Assistance, Operations-Complexity 1	Added Construction Added Operations
IS 3	**SPECIALIST - SOFTWARE** Customer Assistance, Operations-Complexity 2; Construction-Complexity 1 **SPECIALIST - COMMUNICATIONS, HARDWARE or DATA (NOT SOFTWARE)** Customer Assistance, Operations, Construction-Complexity 2	Level 2 Complexity for Customer Assistance and Operations Level 2 Complexity for all three
IS 4	**SPECIALIST - SOFTWARE** Customer Assistance, Operations, Construction-Complexity 2 **GENERALIST** Customer Assistance, Operations-Complexity 2	Level 2 Complexity for Construction Level 2 Complexity for Both
IS 5	**SPECIALIST** Customer Assistance, Operations, Construction, Planning-Complexity 2 **SPECIALIST** Customer Assistance, Operations-Complexity 3 Construction-Complexity 2 **GENERALIST** Customer Assistance, Operations, Construction-Complexity 2 Planning-Complexity 1	Level 2 Complexity for Planning Level 3 Complexity for Customer Assistance and Operations Level 2 Complexity for Construction
IS 6	**SPECIALIST** Customer Assistance, Operations, Construction-Complexity 3 **GENERALIST** Customer Assistance, Operations-Complexity 3 Construction-Complexity 2	Level 3 Complexity for Construction Level 3 Complexity for Customer Assistance and Operations
IS 7	**SPECIALIST** Customer Assistance, Operations, Construction, Planning-Complexity 3 **GENERALIST** Customer Assistance, Operations, Construction-Complexity 3 Planning-Complexity 2	Level 3 Complexity for Planning. May only have Construction & Planning (no Customer Assistance or Operations). The Construction and Planning is what makes them Level 7. Level 3 CO, Level 2 PL
IS 8	**SPECIALIST - DATA OR SOFTWARE** ONLY Customer Assistance, Operations, Construction, Planning-Highest Level Complexity (3 or 4) **GENERALIST** Construction and Planning-Highest Levels	Must have the highest Construction and Planning levels in SOFTWARE or DATA. Must have the highest Construction and Planning levels

IS TECHNICAL/PROFESSIONAL CLASSIFICATION SERIES ALLOCATION LEVELS

APPENDIX C

Specialist
(One or Two Infrastructures)

Infrastructure	Customer Assistance	Operations	Construction	Planning	Class
Any	1	1			IS 1
Any	1	1	1		IS 2
Software	2	2	1		IS 3
Comm, Hardware or Data	2	2	2		IS 3
Software	2	2	2		IS 4
Any	2	2	2	2	IS 5
Any	3	3	2		IS 5
Any	3	3	3		IS 6
Any	3	3	3	3	IS 7
Software or Data	Highest	Highest	Highest	Highest	IS 8

Generalist
(Three or Four Infrastructures)

Customer Assistance	Operations	Construction	Planning	Class
1				IS 1
1	1			IS 2
2	2			IS 4
2	2	2	1	IS 5
3	3	2		IS 6
3	3	3	2	IS 7
		Highest	Highest	IS 8

Shaded Boxes: Show the required or deciding factor for level allocations.

This chart summarizes typical Organizational Functions for Specialist and Generalist Positions at each level of the series and the Key Differences between levels based on those Organizational Functions.

APPENDIX D

INFORMATION SYSTEMS JOB PROFILE DOCUMENT

ORGANIZATIONAL FUNCTION	INFRASTRUCTURE FUNCTION			
	COMMUNICATIONS (voice, data, image and video)	**SOFTWARE (operating and applications)**	**HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)**	**DATA**
CUSTOMER ASSISTANCE (help use and fix)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
OPERATIONS (day-to-day)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
CONSTRUCTION (new)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
PLANNING (strategic)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)

1) Using the Primary Dictionary, identify the cell(s) that contain the majority of functions and responsibilities of the position.

2) Indicate % of work time dedicated to each cell.

3) Using the supplemental dictionaries, identify the complexity level for each cell.

Percent of work time for:

Project Leader/Team Leader _____%

Supervisory Duties _____%

Non-I/S Duties _____%

Employee Name _____

_____ _____

Supervisor Completing Form Phone #

Class # & Title _____

Agency Name _____

Division/Unit Name _____

APPENDIX E

INFORMATION SYSTEMS JOB PROFILE DOCUMENT

ORGANIZATIONAL FUNCTION	INFRASTRUCTURE FUNCTION			
	COMMUNICATIONS (voice, data, image and video)	**SOFTWARE (operating and applications)**	**HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)**	**DATA**
CUSTOMER ASSISTANCE (help use and fix)	Percent of work time __15__% Complexity level ___1___ (see supplemental dictionary)	Percent of work time __30__% Complexity level ___1___ (see supplemental dictionary)	Percent of work time __30__% Complexity level ___1___ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
OPERATIONS (day-to-day)	Percent of work time __10__% Complexity level ___1___ (see supplemental dictionary)	Percent of work time __15__% Complexity level ___1___ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
CONSTRUCTION (new)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
PLANNING (strategic)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)

1) Using the Primary Dictionary, identify the cell(s) that contain the majority of functions and responsibilities of the position.

2) Indicate % of work time dedicated to each cell.

3) Using the supplemental dictionaries, identify the complexity level for each cell.

Percent of work time for:

Project Leader/Team Leader _____%

Supervisory Duties _____%

Non-I/S Duties _____%

Job #1 LAN SUPPORT

Allocation: **IS 2 (Generalist)**

Majority of duties involve Customer Assistance on Software, Hardware, some Communications, Level 1 complexity: doesn't work with a variety of operating systems; on-site problem solving involves preliminary diagnosis; no software code fixes; does informal training; standardized systems; senior staff available for assistance.

Other duties related to Communications Operations (e.g., access, backups/library) Level 1 complexity: standard processes, single vendor protocols. Operations also include some Software/Hardware installation at Complexity Level 1: standardized products/ environment, minimal compatibility modifications; established backbone (doesn't create connections).

INFORMATION SYSTEMS JOB PROFILE DOCUMENT

ORGANIZATIONAL FUNCTION	INFRASTRUCTURE FUNCTION			
	COMMUNICATIONS (voice, data, image and video)	**SOFTWARE (operating and applications)**	**HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)**	**DATA**
CUSTOMER ASSISTANCE (help use and fix)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **20**% Complexity level **2** (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **10**% Complexity level **2** (see supplemental dictionary)
OPERATIONS (day-to-day)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **5**% Complexity level **2** (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **5**% Complexity level **2** (see supplemental dictionary)
CONSTRUCTION (new)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **45**% Complexity level **2** (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **15**% Complexity level **2** (see supplemental dictionary)
PLANNING (strategic)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)

1) Using the Primary Dictionary, identify the cell(s) that contain the majority of functions and responsibilities of the position.

2) Indicate % of work time dedicated to each cell.

3) Using the supplemental dictionaries, identify the complexity level for each cell.

Percent of work time for:

Project Leader/Team Leader _____%

Supervisory Duties _____%

Non-I/S Duties _____%

Job #2 SYSTEM ANALYST

Allocation: **IS 4 (Specialist)**

This position works 65% of the time in Software with the majority of that time spent on applications development and maintenance (Construction/Customer Assistance). There is some Data construction as well. There are also some Data Customer Assistance and Operations related activities (e.g., training, resolving system problem, etc). But the Job is essentially a Software Specialist.

The position assists with implementation strategies and is responsibility for assigned project planning and schedules. This is project planning which is part of Construction. This would not be strategic planning as defined on the Dictionary.

Duties are consistently at Level 2 Complexity; large, fairly stable systems with a variety of interfaces, users, performance issues, remote locations and may involve other agencies/jurisdictions. Solves problems affecting a variety of applications; problems affect entire agency; fixes software; mixed database management environment.

INFORMATION SYSTEMS JOB PROFILE DOCUMENT

ORGANIZATIONAL FUNCTION	INFRASTRUCTURE FUNCTION			
	COMMUNICATIONS (voice, data, image and video)	**SOFTWARE (operating and applications)**	**HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)**	**DATA**
CUSTOMER ASSISTANCE (help use and fix)	Percent of work time ___15___% Complexity level ___2___ (see supplemental dictionary)	Percent of work time ___20___% Complexity level ___2___ (see supplemental dictionary)	Percent of work time ___10___% Complexity level ___2___ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
OPERATIONS (day-to-day)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time ___15___% Complexity level ___2___ (see supplemental dictionary)	Percent of work time ___15___% Complexity level ___2___ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
CONSTRUCTION (new)	Percent of work time ___5___% Complexity level ___1___ (see supplemental dictionary)	Percent of work time ___5___% Complexity level ___1___ (see supplemental dictionary)	Percent of work time ___5___% Complexity level ___1___ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
PLANNING (strategic)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)

1) Using the Primary Dictionary, identify the cell(s) that contain the majority of functions and responsibilities of the position.

2) Indicate % of work time dedicated to each cell.

3) Using the supplemental dictionaries, identify the complexity level for each cell.

Percent of work time for:

Project Leader/Team Leader ___10___%

Supervisory Duties _____%

Non-I/S Duties _____%

Job #3 NETWORK ADMINISTRATOR

Allocation: **IS 4 (Generalist)**

This job works approximately 45% in Customer Assistance, 30% Operations and 15% Construction, essentially in the areas of Communications, Software and Hardware. There is also some (10%) time in lead work/coordination activities.

Customer Assistance is at level 2 Complexity: deals with desktop connectivity issues, lengthy diagnosis, reconfigures/fixes software, formal training responsibilities. Installations (Operations) involve coordination with other systems and users (Operating System upgrades/modifications, etc.). Responsible for a single WAN with multiple LAN's, single operating system, doesn't affect other state systems, etc. This is Complexity Level 2 in Operations.

Construction activities (feasibility studies, etc.) are related to upgrades and their impact which is covered by installations (Operations). There is not the in-depth business analysis or process modeling associated with new Construction.

INFORMATION SYSTEMS JOB PROFILE DOCUMENT

ORGANIZATIONAL FUNCTION	INFRASTRUCTURE FUNCTION			
	COMMUNICATIONS (voice, data, image and video)	**SOFTWARE (operating and applications)**	**HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)**	**DATA**
CUSTOMER ASSISTANCE (help use and fix)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **65**% Complexity level **3** (see supplemental dictionary)	Percent of work time **20**% Complexity level **3** (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
OPERATIONS (day-to-day)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **5**% Complexity level **3** (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
CONSTRUCTION (new)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **10**% Complexity level **3** (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
PLANNING (strategic)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)

1) Using the Primary Dictionary, identify the cell(s) that contain the majority of functions and responsibilities of the position.

2) Indicate % of work time dedicated to each cell.

3) Using the supplemental dictionaries, identify the complexity level for each cell.

Percent of work time for:

Project Leader/Team Leader _____%

Supervisory Duties _____%

Non-I/S Duties _____%

Job #4 SOFTWARE ANALYST

Allocation: **IS 6 (Specialist)**

This position serves as a technical resource on operating systems software products and is responsible to keep a system operating. It is a Specialist dealing essentially with Software. Majority of the job duties involve problem solving and system maintenance (Customer Assistance); there are construction and operations functions as well.

The work is directly impacted by a large and complex computing environment, with numerous operating system vendors, widely disparate hardware devices, broad range of internal/external customers/users. Major applications have critical regulatory requirements, deadlines, etc. Problems could affect the operations of a number of other state agencies as well as agency partners. As an expert in a specific area of the computing resources, this position helps other IS staff solve problems and deal with major system crashes. Also provides technical expertise for staff on new system development and existing system modifications.

The position makes technical recommendations to assist management decisions and is responsible for project planning and schedules. This is project planning which is part of Construction. This would not be strategic planning as defined by the Dictionary.

INFORMATION SYSTEMS JOB PROFILE DOCUMENT

ORGANIZATIONAL FUNCTION	INFRASTRUCTURE FUNCTION			
	COMMUNICATIONS (voice, data, image and video)	**SOFTWARE (operating and applications)**	**HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)**	**DATA**
CUSTOMER ASSISTANCE (help use and fix)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **50** % Complexity level **1** (see supplemental dictionary)	Percent of work time **50** % Complexity level **1** (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
OPERATIONS (day-to-day)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
CONSTRUCTION (new)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
PLANNING (strategic)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)

1) Using the Primary Dictionary, identify the cell(s) that contain the majority of functions and responsibilities of the position.

2) Indicate % of work time dedicated to each cell.

3) Using the supplemental dictionaries, identify the complexity level for each cell.

Percent of work time for:

Project Leader/Team Leader _____%

Supervisory Duties _____%

Non-I/S Duties _____%

Job #5 HELP DESK

Allocation: **IS 1 (Specialist)**

This position is in an agency with numerous business and commercial software package applications. Staff are assigned primary responsibility for specific program/operational areas. Duties require a comprehensive operational understanding of the assigned programs and the associated hardware and software. This is a Specialist providing Customer Assistance. Most work is Complexity Level 1.

Position deals directly with users, over the phone, to provide operational assistance, explain how to use the software, resolve equipment and some minor network problems; follows established processes and procedures, does basic investigation, makes referrals, etc. Not involved in physical fixes or diagnostic evaluation of problems.

INFORMATION SYSTEMS JOB PROFILE DOCUMENT

ORGANIZATIONAL FUNCTION	INFRASTRUCTURE FUNCTION			
	COMMUNICATIONS (voice, data, image and video)	**SOFTWARE (operating and applications)**	**HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)**	**DATA**
CUSTOMER ASSISTANCE (help use and fix)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **25**% Complexity level **2** (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
OPERATIONS (day-to-day)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
CONSTRUCTION (new)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time **60**% Complexity level **1** (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
PLANNING (strategic)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)

1) Using the Primary Dictionary, identify the cell(s) that contain the majority of functions and responsibilities of the position.

2) Indicate % of work time dedicated to each cell.

3) Using the supplemental dictionaries, identify the complexity level for each cell.

Percent of work time for:

Project Leader/Team Leader _____%

Supervisory Duties _____%

Non-I/S Duties _____%

Job #6 PROGRAMMER ANALYST

Allocation: **IS 3 (Specialist)**

This position does Software application development and maintenance (Construction and Customer Assistance). Customer Assistance is at Level 2 complexity (e.g., modifies/fixes software to meet legislative or business requirement changes, does conversions, etc.).

Work mostly involves development (programming); some design; works on established projects using agency standards. This job doesn't normally deal with new business processes, compatibility/version issues, or coordinating a variety of users. This is construction at level 1 complexity.

INFORMATION SYSTEMS JOB PROFILE DOCUMENT

ORGANIZATIONAL FUNCTION	INFRASTRUCTURE FUNCTION			
	COMMUNICATIONS (voice, data, image and video)	**SOFTWARE (operating and applications)**	**HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)**	**DATA**
CUSTOMER ASSISTANCE (help use and fix)	Percent of work time ___15___% Complexity level ___2___ (see supplemental dictionary)	Percent of work time ___15___% Complexity level ___2___ (see supplemental dictionary)	Percent of work time ___10___% Complexity level ___2___ (see supplemental dictionary)	Percent of work time ___5___% Complexity level ___2___ (see supplemental dictionary)
OPERATIONS (day-to-day)	Percent of work time ___5___% Complexity level ___2___ (see supplemental dictionary)	Percent of work time ___20___% Complexity level ___2___ (see supplemental dictionary)	Percent of work time ___25___% Complexity level ___2___ (see supplemental dictionary)	Percent of work time ___5___% Complexity level ___2___ (see supplemental dictionary)
CONSTRUCTION (new)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
PLANNING (strategic)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)

1) Using the Primary Dictionary, identify the cell(s) that contain the majority of functions and responsibilities of the position.

2) Indicate % of work time dedicated to each cell.

3) Using the supplemental dictionaries, identify the complexity level for each cell.

Percent of work time for:

Project Leader/Team Leader _____%

Supervisory Duties _____%

Non-I/S Duties _____%

Job #7 LAN ADMINISTRATOR

Allocation: **IS 4 (Generalist)**

This job works predominantly in Customer Assistance (training, troubleshooting, fixing) and Operations (installations, scheduling, performance monitoring). The work involves Hardware and Software and, to a lesser degree, Communications and Data. Therefore, the position is working as a Generalist.

Work involves a variety of integrated systems affecting a significant number of users, performance issues, remote locations, and requires coordinating activities with other systems and jurisdictions. This is generally Complexity Level 2.

INFORMATION SYSTEMS JOB PROFILE DOCUMENT

ORGANIZATIONAL FUNCTION	INFRASTRUCTURE FUNCTION			
	COMMUNICATIONS (voice, data, image and video)	**SOFTWARE (operating and applications)**	**HARDWARE DEVICES (PC, server, mainframe, peripherals, etc.)**	**DATA**
CUSTOMER ASSISTANCE (help use and fix)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time __5__% Complexity level __3__ (see supplemental dictionary)
OPERATIONS (day-to-day)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)
CONSTRUCTION (new)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time __40__% Complexity level __3-4__ (see supplemental dictionary)
PLANNING (strategic)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time _____% Complexity level _____ (see supplemental dictionary)	Percent of work time __20__% Complexity level __3__ (see supplemental dictionary)

1) Using the Primary Dictionary, identify the cell(s) that contain the majority of functions and responsibilities of the position.

2) Indicate % of work time dedicated to each cell.

3) Using the supplemental dictionaries, identify the complexity level for each cell.

Percent of work time for:
Project Leader/Team Leader __20__%
Supervisory Duties _____%
Non-I/S Duties _____%

Job #8 DATA BASE SPECIALIST
Allocation: **IS 7 (Specialist)**

This position has 15% Miscellaneous Duties not considered for allocation purposes. The 20% Team Leader duties are also not considered in allocating jobs.

The remaining 65% of the duties are Data related, essentially Construction and Planning functions, with some high level Customer Assistance (e.g., problem referrals, guiding other staff, etc.) Approximately 2/3 of the time is spent on Construction and 1/3 on Planning at Complexity Level 3.

The position exists in a dynamic environment with multiple remote locations and a mix of database management systems with distributed data input and manipulation. Within that environment, the job decides the tools, technology, design, and documentation standards, approves design changes and writes and evaluates RFPs. This is level 4 complexity for Data Construction. But, while the technology may be new to the Agency, it is not necessarily new to the State system.

The job also has Planning aspects at Complexity Level 3, e.g., approves data standards, verifies data integrity, etc.

The Job works at Level 3 complexity for Data Construction and Planning. Since the job does not deal with Software, it is most appropriately allocated at the IS 7 level.

GLOSSARY OF TERMS

The following is a list of terminology. It is not intended to be comprehensive or represent the often changing terminology or jargon used by employees in the occupation.

APPLICATION: The subject-matter process or problem to which the computer technology is applied (e.g., a payroll system, a word processing system, a supply system).

APPLICATION SYSTEM: Programs and/or processes developed to meet a particular need or solve a problem.

ARTIFICIAL INTELLIGENCE (AI): A subfield of computer science aimed at pursuing the possibility that a computer can be made to behave in ways humans recognize as "intelligent" (reasoning, learning).

ASSEMBLER LANGUAGE: For this specific definition, one source instruction per machine instruction, whether by mnemonic or machine code.

BATCH: Application programs are run on the computer one at a time.

BATCH & ON-LINE: Batch processing is performed with on-line control.

BATCH PROCESSING: The sequential processing of work via a scheduled job stream, including Remote Job Entry (RJE), using a Job Control Language (JCL).

CAD/CAM: Computer Assisted Design/ Computer Assisted Modeling.

CASE: Computer Aided Software Engineering.

CENTRALIZED MANAGEMENT ENVIRONMENT: A majority of IS functions are located at one central processing center.

CLIENT/SERVER: A model supported by the operating systems in which the user runs the "client" software that allows them to access the centralized services of a database application "server."

CODING: Expressing the solution to the problem in a computer language

COMMUNICATIONS NETWORK: A network in which input/output data links to one or more central computers. Data and commands are transmitted via use of telephone lines, microwave, etc.

COMPUTER SYSTEM: Includes hardware and software.

COMPILERS: (See High level language) FORTRAN < COBOL, etc.

CONSOLE: The part of a computer system that enables human operators to communicate with the system.

CPU: Central Processing Unit.

DASD: Direct Access Storage Device. A basic type of storage medium that allows information to be accessed by positioning the medium or accessing mechanism directly to the information required, thus permitting direct addressing of data locations.

DATA BASE ADMINISTRATION/ MANAGEMENT: Developing, selecting, and maintaining computer data bases to obtain greater efficiency in computer memory and processes; determining the way in which data is organized in the data base and assigning names and definitions to the various records and fields; and overseeing the security system and controlling all information placed in or deleted from the data base.

DATA BASE MANAGEMENT SYSTEM (DBMS): A software system for storing, revising, and retrieving data shared by a number of users.

DATA MANAGEMENT: (1) The function of controlling the acquisition, analysis, storage, retrieval, and distribution of data. (2) In an operating system, the computer programs that provide access to data, perform or monitor storage of data, and control input/output devices.

DECENTRALIZED MANAGEMENT ENVIRONMENT: IS functions are distributed among functional or geographic units with only general guidance provided by a central authority.

DECISION SUPPORT SYSTEMS: Generally applies to systems that Are designed to help managers evaluate and analyze complex situations.

DISSIMILAR OPERATIONS: To serve many divergent business operations by the same data processing system.

EDI: Electronic Data Interchange.

END USER: Normally refers to a user/operator in a subject matter environment using standalone or networked personal computers and software tailored for the subject-matter processes.

EXPERT SYSTEMS: A specialty within the field of Artificial Intelligence (AI). Computer programs, typically 'rule-based', that are intended to model the performance of a human expert in his or her specialized task(s)

4GL: 4th generation language (e.g., Focus, Nomad).

FORMAL DESIGN METHODOLOGY: Examples range from formal internal standards and procedures which all application development personnel must follow to commercially available methodologies.

GUI: Graphical User Interface.

HARDWARE: Physical equipment used in data processing, as opposed to programs, procedures, rules, documentation, etc.

HIGH LEVEL LANGUAGE: For this specific definition, one source statement will generate one or more machine instructions and includes such languages as PASCAL, COBOL, PL/1, and FORTRAN. These languages are designed for problem solving without knowledge of the particular machine codes (see "Compilers"). Allows programmer to express operations in terms similar to a normal human-language representation of a problem statement or procedures to be followed.

INTERACTIVE SYSTEM: Pertains to applications in which each entry calls forth a response from a system or program, as in an inquiry system or an airline reservation system. An interactive system may also be conversational, implying a continuous dialog between the user and the system.

JOB CONTROL LANGUAGE (JCL): A problem-oriented language designed to express statements in a job that are used to identify the job and describe its requirements to an operating system.

JOB STREAM: The sequence of job control statements and data submitted to an operating system on an input unit especially activated for this purpose by the operator.

LOCAL AREA NETWORK (LAN): A group of computers linked together so that they can communicate with one another and share resources. In this environment, users can access hard disk drives, printers and other peripherals and take advantage of special network services such as access to a mainframe system. All of these devices are shared and are available to anyone on the networks.

Sharing data and resources among several small computers within a small geographic area such as an office or a building.

LOCAL CONTROL: the management control over every location is exclusively housed adjacent to the data processing installation and no long distance control of any kind is involved.

MODULAR PROGRAMS: The major application programs written for the installation were written with small, self contained, easily modified sections or modules.

MULTIPLE LOCATIONS: The equipment and its management are spread between buildings within the same or different cities.

MULTIPROCESSING SYSTEM: A computer system employing two or more interconnected processing units to execute programs simultaneously.

MULTIPLE PROCESSORS, COUPLED: More than one central processing unit within the same room such as an attached processors (AP system) or multiple processor (MP System).

MULTIPLE PROCESSORS, TELECOMMUNICATIONS: More than one central processing unit connected remotely via teleprocessing control units and teleprocessing lines regardless of the actual distance.

MULTIPLE PROCESSORS, UNCOUPLED:

More than one central processing unit within the same room but operating entirely independent of each other.

MULTIPLE PROGRAM EXECUTIVE: Processing of work through a computer handling two or more jobs concurrently.

MULTI-TERMINAL TELEPROCESSING SYSTEMS: Systems comprised of multiple terminals connected to a communications network.

NETWORK: A complex consisting of two or more interconnected computers., Also see Communications Network.

ON-LINE: Peripherals or terminals operate in direct interactive communication and under the control of the CPU via a communication channel.

ON-LINE DATABASE SUPPORT: Provides maintenance and support in realtime environment where the database is an integral part of the operations of the organization.

ON-LINE SYSTEM: A system in which the input data enters the computer directly from the point of origin or in which output data is transmitted directly to where it is used.

OODBMS: Object Oriented Database Management Systems.

OOP: Object Oriented Programming. A programming methodology that assembles data and procedural code into a hierarchy of objects which may each have levels of abstraction.

OPERATING SYSTEM: A set of programs that allows the computer system to manage its own resources.

PERSONAL COMPUTER (PC): A relatively low cost, portable or semiportable microcomputer, generally sold with software packages.

PRODUCTION SYSTEM: An ongoing application system which is a series of computer programs or processes used to provide output on a regular basis or on demand.

PROCESS CONTROL: The processing of work in a closed-loop environment where the output of one process becomes the control for the input of the same process or for the next in a series of processes.

REAL TIME: Transactions are processed as they occur rather than accumulating them and running them in batches. On-line processing is used for realtime systems; however, not all on-line processing is realtime. On-line computer processing system that receives and processes data quickly enough to produce output to control, direct, or affect the outcome of an ongoing activity or process.

REMOTE CONTROL: Some type of long distance management control is exercised.

REMOTE JOB ENTRY (RJE): Refers to the computer programs used to submit processing jobs from remote terminals.

SIMILAR OPERATIONS: To service a single type of business.

SINGLE LOCATION: The entire system and its management are in the same building.

SOFTWARE: Computer programs, procedures, rules, and associated documentation concerned with operation of a data processing system.

STANDARDS: Written instructions and directions for computer specialists to achieve uniformity in systems, coding, and related programming techniques and usages.

STRUCTURED PROGRAMMING TECHNIQUE: A program or system development procedure that involves modularization into logical functional units; special attention is paid to documentation and techniques. "Top down" program design is one example of a structured technique.

SYSTEM: (1) The total collection of interconnected and interrelated equipment and its processing capabilities available to perform data processing functions; (2) a collection of interrelated programs, typically using a common data base or interconnected data bases, to produce output for functional users; or (3) a collection of people, machines, and methods organized to accomplish a set of specific functions.

SYSTEMS SOFTWARE: Computer programs, usually provided by the computer

manufacturer, that are necessary to process applications programs and for the operation of the computer and its peripheral devices. Included, for example, are assemblers, compilers, operating systems, and utility routines.

TELECOMMUNICATIONS: As related to this occupation, data communication connections between computers, usually carried over telephone circuitry. Telecommunications systems typically include modems to interpret signals compatible with sending and receiving units, dial-up or on-line access to telephone channels, and protocol converters to assure the ability to interpret signals.

Information transmission between a computing system and remotely located devices via a unit that performs the necessary format conversions and controls the rate of transmission.

TELEPROCESSING NETWORK: See Communications Network.

THREE TIER ARCHITECTURE: A software development methodology that employs three levels, each performing a different function; The three tiers consist of the user interface, 'middleware' that contains the rules or business logic, and the relational DBMS server(s). Usually written for an enterprise-wide client server network. Requires customized system management software to monitor all elements of the three-tier system.

UNSTRUCTURED PROGRAMMING TECHNIQUE: No particular programming structure, such as 'top down' program design or other similar programming concepts, are used in the application programming effort.

USER FRIENDLY: Computer system using software that is designed for ease of use by personnel untrained as computer specialists.

UTILITY PROGRAMS: A computer program in general support of the processes of a computer; for instance, a diagnostic program, sort program, a program designed to copy data from one storage device to another, etc.

UTILITY/SERVICE BUREAU: Standard, stable applications run from central processing centers. May service internal and/or external clients.

WIDE AREA NETWORK (WAN): Data Communications which link two or more geographically separated location to share data and resources among a number of small computers within a widely dispersed geographic area.