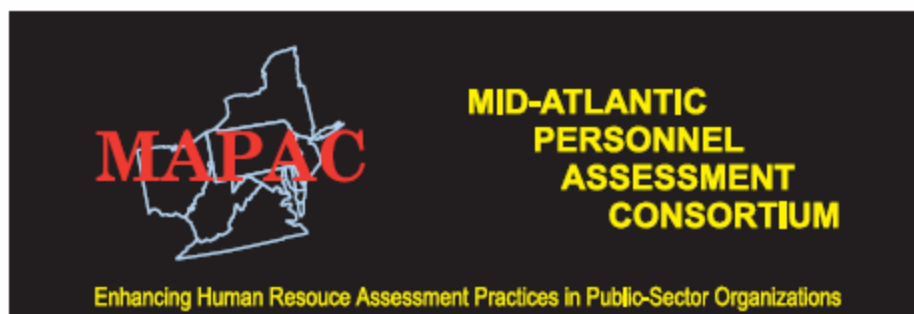


KSA-BASED MINIMUM QUALIFICATIONS

Development / Interpretation Information & Guidelines

DEFINED: Minimum Qualifications establish the lowest level of acceptable training and experience needed such that it would be reasonable to expect individuals having less training and experience not to be able to satisfactorily perform, or learn to perform, the duties of the position for which the MQs are developed...



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PREFACE

In the context of public service employment practices, what do job minimum qualifications represent? How are minimum qualifications used to screen candidates? What are the characteristics of appropriate and meaningful minimum qualifications? How does one begin to develop job relevant minimum qualifications? How does one interpret minimum qualifications in light of candidate applications? All are important questions and the subject of this report.

Establishing, interpreting and applying minimum qualifications used in public service job descriptions and on employment announcements involve deceptively complex processes. On the surface it would seem to be a rather straightforward process when developing minimum qualifications of committing to paper what people are expected to have in terms of training and/or experience going into a job. However, like the proverbial iceberg, the mass contributing to the problems and confusion surrounding the development and interpretation of minimum qualifications, lies below the surface. Without a systematic analysis of both the intended use of minimum qualifications and the actual process of developing them, a job analyst may be able to gracefully float along and not have any problems in most encounters with minimum qualifications. However, one day there may be a challenge, and it will be the mass below the superficial considerations that may sink the job analyst's well-intended efforts. In an IPMAC Practice Exchange article, L. Seberhagen stated that, "MQs are not obsolete but need a 'makeover' for 2000 and beyond. MQs can still provide a useful way to screen out applicants who are obviously unfit for the job, regardless of whether the applicants take any other tests. MQs can also provide a vehicle for giving applicants a realistic job preview so that applicants who decide that the job is not right for them can withdraw voluntarily, without becoming an official applicant." [Seberhagen, L, Seberhagen & Associates, *Minimum Qualifications 2000, Practice Exchange*, Ilene Gast, Associate Editor, International Personnel Management Association Assessment Council (2000)]. In agreement with Dr. Seberhagen, this 2005 visit to this topic represents a "and beyond" view of the state of where we are on this important subject.

The process described in the guidelines presented in this report results in the development of "Knowledge, Skills and Ability (KSA)-based" minimum qualifications. That is, the justification for the resultant qualifications is rooted in an analysis of the entry-level knowledges, skills and abilities. Minimum qualifications derived as the result of a KSA-based process would permit the job analyst to say that:

"Candidates meeting these minimum qualifications would likely be able to satisfactorily perform the duties expected of them at day one on the job."

However, minimum qualifications statements are not always based upon a direct analysis of the KSAs alone. Perhaps, for purposes of broadening the recruitment field or for some other policy considerations, the job analyst may seek to intentionally open up the candidate field by, in effect, lowering the level of minimum qualifications required. Minimum qualifications developed as a result of this type of policy consideration would permit the job analyst to say that:

"Some candidates meeting these minimum qualifications would also meet KSA-based higher-level qualifications and, therefore, would be able to satisfactorily perform the duties expected of them at day one on the job. However, it is also expected that some candidates not meeting the higher-level standard would be able to LEARN to perform the duties of the position."

When minimum qualifications are established for this latter purpose, two additional considerations should be made. Before these broad-based qualifications are established, the job analyst should determine that either:

1. An additional selection screen will be used that will eliminate from further consideration those candidates who do not possess critical knowledges in sufficient amounts to be able to learn to perform the duties of the position.

OR

2. The job can be sufficiently restructured to incorporate a training requirement that would give incumbents specific training in critical knowledges of the position in order to bring them up to a competency level commensurate with that necessary to be able to perform the duties typically expected of them at day one and beyond.

The process described in this report deals only with KSA-Based Minimum Qualifications. However, the job analyst should be aware of those other considerations so that additional decisions can be made at appropriate times if necessary. In a 1997 *Personnel Psychology* paper on the subject of developing and validating Minimum Qualifications, researchers Levine, et. al., describes a methodology involving an analysis of job tasks as well as Knowledges, Skills and Abilities [Levine, E., Maye, D., Ulm, R., Gorgon, T. (1997). *A Methodology for Developing and Validating Minimum Qualifications (MQs)*, *Personnel Psychology*; Winter 1997; 50 (4), 1009 – 1023]. As subsequently described in this report, the KSA-Based process described here does not directly include an assessment of Job Tasks. This is not to suggest that the KSA-based methodology discussed here and the methodology presented in the Levine, et. al., report are necessarily divergent. The subject of this report is not on the development of KSAs but minimum qualifications; inasmuch as KSAs necessarily flow from job tasks, the assumption given here is that the KSAs are relevant and necessarily linked to the job tasks. Inasmuch as KSAs flow from an evaluation of tasks and inasmuch as subsequent selection instruments, i.e., tests, are focused upon assessment of day-one KSAs, the process of this report is to focus the job analyst's energies upon the assessment of KSAs and the linkage to resultant minimum qualifications. The Levine, et. al., method does offer that added assurance that the task – KSA linkages are rightful, however in doing so it also increases the level of complexity involved in the process of developing minimum qualifications. While acknowledging the risks, focusing upon KSAs will add simplicity to the job analyst's task of developing minimum qualifications. Therefore, the job analyst should keep in mind that the assumption in the KSA based model describe here is that the KSAs are appropriate for the job. If there is any doubt regarding this assumption or if the job analyst is involved in the more global activity of developing job tasks, KSAs and minimum qualifications at the same time, the job analyst may want to consider the methodology presented in the Levine report.

The goal here is to assemble available information on the subject of Minimum Qualification development and interpretation into a single package for personnel technicians and managers use as a guide and reference. We are under no illusion that the guidelines contained in this report will solve all of our problems or answer all of our questions concerning the tribulations of developing and interpreting minimum qualifications. This report is not intended to result in the proverbial "cook book" some practitioners may desire, and professional judgment

is still needed to accomplish the task of developing and interpreting minimum qualifications. However, a study of the contents of this report will heighten awareness of existing problems. And, if the procedures described in this report are carefully followed, we--and more importantly, our candidates--will be far better off.

Inasmuch as the process needed to develop minimum qualifications is similar to that used to interpret them, the job analyst will find some repetition in the contents of this report. The repetition is intended to reinforce the process principles and is intended to demonstrate the relationship between what is needed to develop justifiable minimum qualifications and what is needed to make justifiable minimum qualification determinations.

INTRODUCTION

To set the stage for what is to follow in this report, a reprint of an article that appeared in the now out of print *Public Personnel Review Journal* is presented here for your consideration. It is intended to provoke some thought on the subject of using minimum qualifications in public employment selection programs. For the most part, many of the issues and concerns discussed in the following article are as relevant today as they were when it was first written.

TIME TO RETHINK MINIMUM REQUIREMENTS

By John M. Posegate

This article is frankly designed to stir up further discussion--and controversy, if need be--on a subject which, in the opinion of the writer, badly needs thinking through by those in the field of personnel administration. It is a plea for personnel people to break away from traditional concepts, to attempt to relate minimum requirements more specifically to what the job itself actually requires, and to think through what minimum requirements in a growing merit system should do, and what they should not do.

Many minimum requirements now in existence are based on concepts that grew out of depression times. When supply was much greater than demand, employers felt they could be as "choosey" and arbitrary as they wished. However, depression or no depression, public employers really can't afford to cast aside, on any arbitrary basis, potentially qualified employees.

Minimums Should be Minimums

A first and most elementary observation is that minimum requirements should actually be minimums. They should be merely the first rough sifter in the selection process--if the latter process is effectively in operation. Minimum requirements should weed out from further consideration those--and only those--who clearly can't handle the job. All too many specifications, however, seem to represent just the other extreme, that of providing a work description of the perfect employee--as though describing him would produce him.

It must be recognized that available individuals who most nearly possess all of the high qualifications that one could desire will (to the extent that the latter can be properly tested or evaluated) come to the top anyway in the selection process; they don't have to be called for in minimum requirements. To establish unnecessary minimums is to risk eliminating, right at the start, a part of an often meager supply of individuals capable of doing a job. Doctors are reputed to bury their mistakes. Personnel people never know how many capable men and women they may be burying by wielding arbitrary minimum requirements.

Education and Experience Requirements

Minimum requirements for many general types of positions can hardly be absolute minimums if they unnecessarily eliminate, because of arbitrarily established education and experience requirements, any potential recruits that are needed. In this article I shall present, as best I know how, the argument that, for many general administrative-type jobs at least, formalized education and experience requirements have assumed a greatly overemphasized

importance in the selection process. They can hardly be expected to be a reliable index to good performance, and they restrict open competition.

For the great mass of administrative and clerical jobs that are not highly specialized, it is time that we ask, "Do three years, say, of college and three years of experience, make an individual any more capable or, any better qualified than do two years of each?" We need to ask further, "Does the fact that an individual happens to have worked for two years, or five years for that matter, at something, automatically prove that he is more capable for that work than someone who hasn't?" A third question we can well ask is "Does just going to, or even graduating from, college really prove much of anything that couldn't in any case be much better established by equitable and sound testing methods?" I think the answer is "No" in all three cases.

Are Years of Schooling a Measure of Ability? If the amount of schooling an individual has had can be established to an index of general mental capacity that is at all dependable, then a merit system examining staff has, in this respect, something tangible to work on. Some relationship probably exists; however, at least for the college and upper high school levels, it can be nothing more than a very remote one. Psychological examinations given annually to freshmen in over 300 colleges have revealed some very interesting things. For example, the tests, uniformly applied throughout the country, provided in 1945 a mean score of 99 for all who took the tests. However, there was a tremendous variation in the mean scores for the freshmen in various schools--from 127 for the college at the top of the list, to decidedly less than half that figure (27, in fact) for the college at the bottom of the list. If the colleges vary so greatly in the capacities of their incoming students, they must of necessity also vary greatly in the level of work that the students are given and are able to accomplish and the level of work required for graduation and hence, in the significance of the degree awarded. It would appear obvious that testing is a better means of discovering the individual's mental capacity than a quantitative scoring of the number of years of schooling to which he has been subjected.

How Valuable Is Experience? Experience is something everybody wants more of. We like to think of ourselves as having been "through it all" and knowing "what it means." Experience does have much to offer. Some people, like blotters, absorb much. Others unfortunately tend to be rather nonabsorbent.

It is risky business drawing too many assumptions about the benefits of experience. Experience can provide many intangible, but nevertheless definite, assets, such as broadened vision, deeper understanding of human nature, and better conception of working relationships. It can provide practical knowledge of supervisory and administrative techniques; it can develop ability to organize work, ability to sell programs and ideas, etc. But it doesn't necessarily do so. It all depends upon the individual. Many go through a lifetime of work experiences and gain all too little from them. Others gain benefits from limited experiences and from the ordinary contacts of life itself.

It must be recognized that experience can be just as harmful as it can be beneficial, depending again upon the individual. It can crystallize wrong concepts, conventionalize one's thinking, deaden vision, get one into a mental rut, or develop an autocratic attitude.

How About Quality of Performance? The quality of performance in past work experiences--to the extent that it can be determined--would seem to be of more real significance than the mere possession of a specific quantity of experience, or even of a specific type of experience, in many cases. It is questionable whether many merit system agencies have

explored very far the possibilities of personal investigation of past work performance. There are those who will throw up their hands and say this sort of thing is "subjective." Granted that it is very difficult in many cases to determine the quality of work an individual has done, that it is difficult to segregate bias from truth, and that personal investigations are perhaps too expensive a proposition for most lower-level positions; nevertheless, it is the opinion of the writer that there is much of significance that can be discovered and properly evaluated through intelligent and fair-minded investigation.

Requiring Familiarity with a Given Field of Work. In highly specialized fields of work it is, of course, much more necessary for a new employee to have specialized training or experience, or both, than it is in more general fields. The less specialized the field becomes, the easier it is for a new employee, if he is capable, to become familiar with the work after going on the job. Obviously, in a great many fields, particularly those concerned with general administration, specialized experience is of limited significance compared with the individual's ability to do a good job. An alert individual "catches on" quickly and gets acquainted with the work in a relatively short time.

Unfortunately, it is only human nature for people to think of their own particular lines of work as being highly specialized--"different" so to speak--from most other lines of work, and therefore requiring much specialized training and experience.

The Danger of Inbreeding

The more that free competition is obstructed through the building of walls around unnecessarily narrowed fields of specialized administrative work, the greater the danger becomes of reaping bad effects from inbreeding. Patterns of thought tend to become set. Those in the field are apt to get so close to the trees that they often don't see the forest.

Any field of work, or for that matter any organization, needs a certain amount of new blood flowing into it, and the flow shouldn't by any means be restricted to the entrance level jobs. Frequently, minimum requirements for jobs up the line are so restrictive as to the types of admissible experience that few, if any, outsiders have much of a chance to be considered. Overemphasis on promotions within the agency, to the exclusion of consideration of capable outsiders, can seriously endanger the vitality of an organization. A freshness of viewpoint can often more than offset a lack of detailed knowledge of a given line of work in a specific field or agency.

The fact that an individual has had experience or training in a given field does not in itself establish the fact that he has the basic capacity for high quality performance in that field. Too many of us can recall too many cases of square pegs jammed into round holes or, what is more painfully the case, of little men rattling around in big jobs, to accept such a conclusion. There are people who happen to get into a given line of governmental administrative work who haven't any decided capacity for high quality performance but who manage to hang on year after year and build up an experience record that looks quite impressive on paper. Once some experience is gained by such an individual, his employment advantage multiplies greatly as additional experience is gained.

If there is a really plentiful supply of generally capable individuals who are available, those who are familiar with the particular type of work in question are naturally to be preferred. Nevertheless, selection on the basis of familiarity with a field of work shouldn't take precedence for any level of job over the basic objective of selecting capable individuals. Neither should it

override the continuing problem of drawing in a certain amount of new blood up and down the line.

What Does the Job Itself Require?

Assuming that formalized education and experience requirements are deemphasized, where they are now overemphasized, the question arises as to what minimum requirements should be set. There is no way of providing a realistic answer to that question without determining through careful analysis what the job itself is and what, specifically, it demands of the individual who occupies it. The problem of determining minimum requirements is inseparable from the problem of establishing the whole of the selection process. Until we can determine the types of things that a given job requires of an individual, we are hardly in a position to set in a realistic manner minimums that may be needed for any of those requirements.

All too often, the setting of job requirements has degenerated into a routine proposition of "writing specifications." This may produce a beautiful pattern of internal consistency so far as minimum requirements go, but what it means in terms of finding and hiring the most capable people is a horse of another color.

Careful analysis may indicate that a job requires any combination of such personal attributes as general reasoning power; knowledge (either of general information or of specific facts); skills of various types; certain concepts or attitudes (such as a comprehension of broad objectives and a progressive approach to problems); emotional stability; open-mindedness; and an ability to put ideas across, inspire others and get results.

Personnel administrators should be thinking more in terms of the minimums of these qualities and combinations of qualities which will accomplish the specific job, and seek to eliminate only those individuals who clearly don't measure up.

The First Screen. The absolute minimum that carries the best hope of being valid and that is early applied should serve as the first screen in the selection process.

In specialized fields, an absolute minimum pertaining to specialized training and experience that is definitely needed can, of course, most easily be applied as a first screen. Where funds and staff permit, possession of that required minimum would preferably be determined through appropriate tests of the specialized skills or knowledge required, rather than by reviewing the paper record of quantity and type of training and experience shown.

In the more general administrative lines of work, a minimum score on a test of general mental capacity would certainly appear to be a more valid measure to apply as a first screen than would a superficial counting of time served in educational institutions or in specified types of jobs. (Tests now being given by colleges and some merit systems to determine whether veterans without a requisite formal education have an equivalent of the same are a step in this direction.)

Must They Be Pretrained? The process of determining what the job requires of the individual should, in my opinion, always include the making of a decision on these two basic questions: (1) What essential attributes are there that the newcomer must possess, if at all possible, when he is employed for the job; and what is their relative importance? (2) What other attributes (knowledge, skills, etc.) could he, if need be, acquire after selection through a

reasonable amount of training and on-the-job experience; and what is the relative ease with which they could be acquired? (The job analysis sheet should be so designed to set these things out in bold relief.)

A decision on these questions provides a sound basis for an integrated in-service training and staff development program. It makes good induction procedures possible. It provides a basis for making special job assignments for training purposes of newly selected supervisory staff. And, most important of all perhaps, as broad a competition as the law of supply and demand may require is available for seeking out people with basic capacity but lacking specific job knowledge. At the same time, it is possible to cut down on training and ask more of candidates before selection whenever sufficient supplies of capable people become available. When available recruits are scarce, as is now usually the case, it seems imperative that nothing be required as a minimum before selection that can be trained into an individual after selection.

(As an example of the validity of this technique, consider the selection for employment in our own particular field of personnel administration. Isn't it true that a basically capable individual having the right characteristics can, with an adequate training plan, enter the field--not only at the bottom but on higher rungs as well--and do a successful job? I think so.)

In the remainder of this article, some of the far-reaching ill effects that I believe can--and do--result from hastily conceived minimum requirements are discussed. They represent pitfalls that those who analyze jobs and plan and administer the selection process should take every precaution to avoid.

Barriers to Free and Open Competition

MINIMUM REQUIREMENTS can become instruments that in actual practice operate to choke off, rather than to nurture, effective competition among the most capable individuals available.

Sometimes the tail is allowed to wag the dog. Unnecessary minimum requirements become in large measure a primary selection device, taking the place of actual testing and evaluation of capacity and performance. Competition can't be effective if relatively superficial considerations are allowed to keep capable people from being given realistic consideration.

What are some of the types of unwarranted minimum requirements that can help to choke off effective competition at its source?

1. Unnecessary minimums as to formal education.
2. Unnecessary years of required experience.
3. Unnecessarily narrowed fields of specialized experience.
4. Unnecessary restrictions as to types of employing agencies or types of jobs held in specialized fields.
5. Unnecessary requirements as to special college courses or majors that keep inherently capable individuals out of competition.

6. Minimums, including knowledge requirements, which tend to protect "insiders" in an organization or a given type of work against the competition of "outsiders."
7. Arbitrary age and experience requirements that are ill-advisedly designed to measure maturity of the individual.
8. State and local restrictions which, for higher positions at least, sometimes cut down badly needed competition to a mere fraction of what it could be.
9. Prohibitions against the employment of married women, because they "don't need the work."
10. Arbitrarily established minimums that cast aside many thousands of women who, simply because they have been preoccupied with family responsibilities, have not had extensive employment records but who are nevertheless in many cases very capable.

It is sometimes believed that for any type of supervisory job a certain amount of prior supervisory experience should be required. This can hardly be considered sound; every supervisor has had at some time to make a start without prior supervisory experience. The same situation occurs with the lower so-called "entrance" classes through which it is necessary to recruit numerous individuals into an organization; prior experience comparable to that to be gained after selection can hardly be required.

Setting the Examination Pattern

JOB REQUIREMENTS, minimum or otherwise, are an integral part of the selection process. Obviously, therefore, those who analyze job requirements and those who examine candidates should work together closely in developing a well-integrated selection program. (Question: Should not one person perhaps do both for a given line of work?)

Every effort should be made to set up job requirements in such a manner that the examining process will not be any more complicated than is necessary to attain effective results.

Even though job needs may vary slightly for different levels of classes in a series, does it necessarily follow that significantly different minimums of formal education and experience can, or should, be set up? The person with six years of given experience isn't particularly better than one with five--or less--years. In fact, just the reverse may often be true. One is reminded of the gentleman who carefully pointed out that he had "nine years of experience" on a given job. He quickly got the rejoinder, "What you probably had was one year of experience, nine times repeated!"

Differences in minimums that do not clearly result in the selection of better, or differently qualified, individuals merely serve to create more paper work in the examining office. There is no basic reason why minimum requirements in some cases might not be the same for two, three, or more classes in a given series.

It is not necessary that each succeeding class in a series require one or more additional years of experience over and above that required for the lower class. Such a pyramiding process would require individuals as aged as Methuselah to qualify for top positions in our federal government! Youth has much to offer. Why not allow it to compete on even terms?

In many merit system jurisdictions, elimination of split-hair differences in minimum education and experience requirements would permit a definite simplification in the existing examination processes. Somewhere along the line the idea got started that slightly different minimum requirements must be written, that different examinations must be given, and different employment registers set up for each one of a series of similar classes (differing primarily only in level of work responsibility). One examination and certification from one register would often give just as discriminating and just as valid results as are now produced from two to four examinations and registers.

The Keep-in-Line Advancement Concert

THERE IS ALWAYS need for highly capable administrators and specialists, they appear on the scene, and the need for using them is so real that they should be allowed to rise as fast as their demonstrated abilities warrant. For this reason it does not seem necessary or desirable to require for each level of responsibility some experiences on the level immediately below it. Such an arbitrary requirement blocks the rise of unusually capable individuals. It causes a serious waste their capabilities both for themselves and their employers. . Such individuals are made to mark time while they "climb the ladder" as slowly as the fellow next to them.

For general administrative positions, it would appear that all that would absolutely need to be required might be a year, say, of any experience that is equal in level of responsibility to a specified class perhaps two to four levels down the line. Such a type of minimum would keep the patently unqualified person from applying. That is all that a minimum requirement can or should legitimately be expected to accomplish when there is an adequate selection program.

Rigidity in Promotion

MINIMUM EDUCATION and experience requirements, arbitrarily set without reference to actual needs of the job, can hinder effective placement work within the organization, including the promotion of individuals of demonstrated capacity.

However, if actual job requirements are realistically and carefully determined, such actual requirements can and should constitute the very foundation of an effective placement program. Placement work cannot be effective unless a clear picture is obtained of what each job requires and which of those requirements each individual in the organization has demonstrated he possesses.

Competition among both insiders and outsiders can never be made effective in its real essence unless it is brought into sharp focus with that picture.

Effect on Career-Service Opportunities

IT IS POPULAR to talk about career-service opportunities in governmental work. However, it is well to consider carefully whether those opportunities are actually as real as we might think or hope.

For many of the more important administrative and specialized positions in an organization, real career-service opportunities are drastically limited by:

1. The relatively small size of the agency.

2. A frequent lack of realistic opportunities to cross agency lines which restricts one's "career" to one or two jobs in a single agency, rather than opening the possibilities to jobs in a number of agencies.
3. A serious lack of opportunity to cross state and local lines because of residence barriers.
4. Other arbitrary requirements that eliminate qualified individuals on relatively superficial considerations.

For many types of work, real career-service opportunities cannot be built up within the narrow walls of one agency, or within the narrow walls built around a state, or within the "pigeonholes" often formed by unrealistic minimum qualifications. It is folly to talk of a career service for such types of work unless there are broad areas of opportunity and clear channels through which better jobs, and different jobs, can be obtained by qualified persons.

The "pigeonhole" concept of classification and selection--having no purpose broader than the immediate one of finding people to fill specific classes of jobs at specific times--is hardly consistent with the concept of a career service.

Such absolute minimums as are required should be developed not only with agency promotional opportunities in mind but also broad opportunities for a lifetime of service in a not-unnecessarily-restricted field of work.

Developing Broad-Gauged Administrators

CONSTANT NARROWING of required fields of specialized experience makes it more and more difficult to develop public administrators with a broad background of varied experience and a broad view toward administrative problems. The narrowing trend can have vicious results. Not only does it tend to give those who are inbred a warped viewpoint toward general administrative problems, it also develops few broadly trained administrators.

The field of general budgetary management and fiscal control, personnel management, and research, to name a few examples, are not narrow fields of specialized work around which barriers should be built. There are many areas of general administrative work where the same is even truer. If every minor administrator is more or less forced by minimum requirements to spend his life in one narrow field (or worse yet in a narrow field within a narrow field) from whence are broad-gauged administrators to come?

We would have a better supply of general administrators if more individuals crossed narrow lines of specialization and acquired a background of broad experience. Similarly, to put the shoe on the other foot, would it not perhaps be of benefit if more of those performing personnel and other staff functions crossed over the line occasionally and gained renewed operating experience?

Summary

TO BE REALISTIC, job requirements, including minimums, must be based on a careful analysis of the duties of the job and must relate to conditions of supply and demand. If they are

realistic in this manner, they will help to bring about truly effective competition among the most capable individuals. They also make possible effective placement work within an organization.

If there is an overabundant supply of capable individuals available, it may be desirable to use purely arbitrary educational and experience minimums merely to keep selection down. Generally speaking, however, absolute minimums should be established only when they are clearly related to job needs. Additional qualifications that are desired must, of course, meet the same test.

To go beyond this is to run the risk of checking off effective competition, limiting effective placement work, blocking career-service opportunities, and preventing administrative officials from gaining broad backgrounds of varied experience.

Minimum requirements should call for examination processes that are no more complicated than results warrant.

Minimum requirements should be kept minimums. Qualifications that are desirable should never be used as minimums unless the supply of clearly capable individuals warrants, and then only to the extent that broad considerations of policy justify. Except for highly specialized jobs, selection of those familiar with a given field of work should be kept secondary to the basic problem of selecting inherently capable individuals.

Public Personnel Review, Volume 10, Number 2, April 1949

Either the “art and science” of developing/interpreting/validating minimum qualifications has not progressed very far, or Mr. Posegate was a man way ahead of his time.

DEVELOPING MINIMUM QUALIFICATIONS

*We have a job for which we must develop
minimum qualification standards, now what...?*

THE NEED FOR JOB ANALYSIS INFORMATION

Qualitative criteria for evaluating minimum qualifications:

- ✦ They are demonstrably job related;
- ✦ They are realistically focused upon day-one needs, i.e., “minimum”;
- ✦ They are clearly stated and interpretable by all stakeholders; and
- ✦ They are structured in such a way as to clearly establish education and experience substitution limits (...should an equivalent combination of education and experience be relevant for consideration).

The professional standards that guide Public Human Resource Managers require that all selection decisions be based upon pertinent, verifiable job-related information, that is – job analysis. Make no mistake about it, the setting of minimum qualifications for a job is a selection decision. This is true to the extent that they are intended to eliminate from further consideration individuals who would not be able to satisfactorily perform the duties of the position for which the minimum qualifications are developed. The KSA-Based Minimum Qualification Development Model described here is based upon a content validation strategy. As such, the KSA-based MQ model results in a demonstrable link between the minimum qualifications and the job – more specifically, the critical and important KSAs that are associated with the job.

Job Analysis Defined: A systematic review of information about a job. Generally, this review is conducted in an attempt to better understand the requirements of the position for purposes of making classification/selection decisions.

If KSA-based minimum qualifications decisions are not the sole factors of consideration, the job analyst must document what other factors contribute to the setting of the qualifications, such as affirmative action considerations, recruitment problems, compensation issues, labor-management negotiation issues, court decisions/consent decrees, past incumbent job performance information, or labor market considerations.

Remember:

- The Minimum Qualifications should flow from an evaluation of both the Full Performance Knowledges, Skills, Abilities and Personal Characteristics (KSAPs) section of the duties description and an evaluation of whatever training incumbents will receive on the job.
- This evaluation will assist the job analyst in identifying the entry-level KSAPs needed.

By having job analysis information and focusing upon the entry-level KSAPs, the job analyst will then be in a position to use the information aids and tools described in a subsequent section of this report to develop justifiable, meaningful, and defensible minimum qualifications.

THE NEED TO FOCUS UPON ENTRY-LEVEL KSAPS

Using the information contained in the June 1998 Position Classification manual developed by the New York State Department of Civil Service, job analysts are advised to identify and present FULL PERFORMANCE KSAPs in job specifications since these are the KSAs that will be used by supervisors to judge successful job. It is also easier for job analysts to identify journey-level KSAs. However, in order to develop appropriate minimum qualifications, the job analyst must go one step beyond and identify which KSAs are required at day one (ENTRY level). This is to ensure that the resultant minimum qualifications are indeed “minimum.”

In most instances, to transition from full performance KSAs to entry-level KSAs, the analyst will simply need to determine what, if any, training (formal or informal) will be given to the incumbents once they are placed on the job. Most often this information can be gained by interviewing the supervisors of the job being analyzed. In addition, appropriate regulatory agencies can be consulted to identify what, if any, training programs exist or are planned, which can give incumbents KSAs which would then not be required at day one.

Generally, KSAs involving topics that can be readily learned on the job (even absent a formal training program) can and should be eliminated from further considerations in the setting of minimum qualifications, e.g., knowledge of agency rules, regulations, policies, or abilities in the use of specialized equipment. In jobs where there does not appear to be any formal or informal training that is afforded incumbents after day one (which is more likely to occur in higher level jobs), the Full Performance KSAPs may also end up being the same as Entry-Level KSAPs.

Personal characteristics are typically a product of life's experience, growth, learning, maturation; as such, are not likely to be the subject of training or significantly modified or influenced by job experiences. Consequently, personal characteristics are typically not included in minimum qualification statements. Nevertheless, it should also be expected that incumbents will have varying degrees of the needed personal characteristics at day one, and it is expected that little meaningful change will occur during the course of employment. Therefore, in most cases, Full Performance personal characteristics also represent entry-level characteristics.

What about length of employment? How much experience should be required? Is one year of experience too little? Is ten years too much? As will be discussed in “The Need to Link Knowledge, Skills and Abilities to Minimum Qualifications” section of this report, these determinations will necessarily involve judgment and should also involve consultation with job Subject Matter Experts. As a guide, however, researchers Jacobs, Hofmann and Kriska presented evidence to support a position that the relationship of seniority (years of service) to job performance is positively correlated up to a period of approximately five years, after which the correlation is less definitive [Jacobs, R. Hofmann, D.A. Kriska., S.D. (1990). *Performance and Seniority*, Human Performance, 3 (2), 107 – 121]. This research lends support to limiting the maximum number of years of experience established in the minimum qualifications to no more than five years. However, the job analyst and Subject Matter Experts will need to determine what specific KSAs are acquired by such experience and render a judgment to establish the minimum period of time that should be required in the minimum qualifications statement.

THE NEED TO USE AVAILABLE SOURCES OF INFORMATION AIDS/TOOLS

Once the job analyst has focused on the entry level of KSAs needed, where do we go from there? We need to identify where such KSAs can be learned. What training (education) programs and/or work experience would give individuals the KSAs of interest? Which KSAs can be gained by work experience (e.g., accounting methods, recordkeeping systems, budget preparation methods, knowledge of client social or economic problems, statistical methods, or knowledge of teaching methods)? Which KSAs can be learned in formal education programs (e.g., ability to reading, ability to write, arithmetic computations, knowledge of engineering principles or practices, statistical techniques, criminal justice practices, counseling methods, etc.)? Which KSAs can be learned by either education or experience?

The following tools will be very useful in assisting the job analyst to answer these questions:

- The College Blue Book - This book is divided into two parts. Part I contains a list of colleges in the United States and Canada alphabetically, by state or province. Under the name of each college appears a list of subject areas for which degrees are offered. Part II (which will be of most use to the job analyst) includes an alphabetical listing of over 2500 subject areas for which degrees are offered as well as a listing under each subject area of what colleges offer degrees in the area. Again, the subjects are alphabetical, by state/province. Using the "Blue Book," we can determine the following:
 1. Are there **degrees** in areas we are seeking to consider in the Minimum Qualification statement? Are they prevalent or rare?
 2. Where and at what level are the degrees or fields of studies of interest?
- O*Net - O*NET, the Occupational Information Network, is a comprehensive database of worker attributes and job characteristics developed and maintained by the US Department of Labor. O*Net is the replacement for the former **Dictionary of Occupational Titles** and provides a common language for defining and describing occupations and job requirements. To learn more about this useful resource, visit "[What is O*NET?](#)" web page.
- Occupational Outlook Handbook - The Occupational Outlook Handbook is a nationally recognized source of career information also published by the US Department of Labor. This source of information describes what workers do on the job, their working conditions, the training and education they need, their earnings, and their expected job prospects for a wide range of occupations in the US workforce. To learn more about the information available from the Occupational Outlook Handbook, visit <http://www.bls.gov/oco/> on the Internet.
- College Catalogs – College catalogs are not only useful for students who want to learn about what various colleges have to offer, they can also be used by the job analyst to develop a better understanding of the learning experiences undertaken by individuals completing particular degree programs. What do specific college programs offer in terms of job preparation? What KSAs are taught in various programs?

Example:

GEOGRAPHY - The Geography program is designed to give students a broad background and knowledge of the various avenues of intellectual pursuit within the discipline. Students learn the basic methods employed by geographers, the

theory basic to these, and the various techniques necessary for their implementation. Students are prepared to pursue further study or to move directly into the job market. The basic skills included in many geography courses, such as cartography, air photo interpretation, computer mapping, field methods, and remote sensing make possible the vocational orientation of the traditional liberal arts major. The Geography program also provides a strong background for individuals interested in pursuing a career in environmental or community planning.

Requirements for the Major: Thirty semester hours in Geography, including three hours of Introductory Geography, three hours of Economic Geography, and three hours of Cartography; nine hours in Regional Geography, and in Systematic Geography three hours from each of the following groups: (1) Political Geography, Population Geography, Cultural Geography, Historical Geography; (2) Physical Geography, Regional Terrain and Oils Description and Classification, Regional Climatology, and biogeography; (3) Urban Geography, Geography of Developing Nations, Computer Mapping and Geoinformation Systems, Quantitative Geographic and Planning Models, three hours in Geography Seminar, and three semester hours in statistics by advisement. Courses in related disciplines are recommended.

The College Blue Book, O*Net, Occupational Outlook Handbook and College Catalogs are all tools that can be used by the job analyst to develop the necessary information relating to educational and experiential opportunities where KSAs can be learned.

THE NEED TO LINK KNOWLEDGE, SKILLS AND ABILITIES TO MINIMUM QUALIFICATIONS

Given a listing of KSAs of a job resulting from a job analysis, the next step the job analyst needs to take is to determine where the listed KSAs can be acquired. This step requires professional judgment that should involve the job analyst and if needed, appropriate Subject Matter Experts (SMEs) who can provide additional information relating to the job requirements, the level of KSA proficiency needed as well as what specific education and experience may be available for individuals to acquire them.

To facilitate this task, a “*Job KSA Linkage to Education and/or Experience Factors Worksheet*” is provided in Appendix III. The job analyst, with the assistance and consultation with a representative sample of SMEs having specific job information, can use this worksheet to document information regarding the identification and evaluation of specific education and experience deemed to be relevant to the job under consideration.

- The SME group should be provided with a job description and available job information that lists the Full Performance KSAs. The SME group should then be directed to identify the KSAs listed in the job description that are deemed to be important and critical to job success. To facilitate this process, it may be useful to ask the SMEs to rank the listed KSAs from highest to lowest levels of importance as related to successful job performance and be instructed to reach consensus in identifying the top 50 percent of the KSAs that are more important than the others in the list. Although consensus may take some effort to achieve, this process will focus the SME group upon the listed KSAs that are most important and therefore eliminate from further consideration the KSAs which are of least importance to successful job success. The top 50 percent of the KSAs should then be listed in the left margin of the worksheet.
- The SME group should then review the listing to determine which KSAs are learned on the job subsequent to appointment. These KSAs should be eliminated from further consideration since they are not “day-one” requirements.
- Using “tools of the trade” (i.e., The College Blue Book, O*Net, Occupational Handbook and College Catalogs), the job analyst should then identify the educational programs and occupational classifications/jobs where listed KSAs can be expected to be acquired.
- Education and experience should be listed for each KSA and the job analyst and SME group should then consider the amount of education (high school, college, vocational education programs, etc.) and/or experience (length) that it will likely take of an individual to be exposed to and acquire the relevant KSA.

It is obvious that like most personnel-related decisions, judgment will be needed. The process recommended here will provide the job analyst with a standardized process for documenting the decisions that are to be made in the setting of minimum qualifications. The process of locating and identifying education and experience opportunities where KSAs can be acquired as well as lengths of each to be considered in the minimum qualifications will require some “getting used to.” The job analyst must keep in mind that the KSA-based process recommended here is intended to offer structure and organization to an otherwise freeform, subjective process. Once the job analyst becomes familiar with the informational “tools of the

trade” and begins to develop an understanding of their use and the information available in each, it is expected that use of the process will become more comfortable for the job analyst.

The *Standards for Educational and Psychological Testing* requires that selection decisions be documented and based upon verifiable information that is clearly linked to important aspects of the job. The information gathering and analysis methods recommended here satisfy the professional requirements for standardization and verifiability of the evidence to be used in the minimum qualification selection decision. The KSA-Based Minimum Qualification Development Model recommended here will contribute to the job analyst’s ability to develop minimum qualifications that are both job related and appropriately defined as being truly “minimum.”

THE NEED TO PROVIDE STRUCTURE IN MINIMUM QUALIFICATION STATEMENTS – EQUIVALENCY EQUATIONS –

The concept of Equivalency Equations was first introduced in the 1978 Preparation of Job Classification Specifications Manual (Revised in 1998) and subsequently reprinted in the New York State Department of Civil Service's 1982 and 2001 Training and Experience Examinations Manuals. In the section of each of these references describing the minimum qualification development process, it is stated that:

"The structure of minimum qualifications should establish the lowest acceptable limit of the appropriate experience and/or training qualifications. The 'equivalent combination' statement should be used, where appropriate, to allow for alternative experience and/or training combinations.

Equivalency of training and experience must be interpreted in accordance with the total statement of minimum qualifications. Where specialized training and/or experience is required, possession of 'equivalent training and experience' cannot be used as a substitute for the required specialized experience and/or training.

The substitution limits of training and experience should be established in a NOTE immediately following the equivalency statement. Whenever an equivalency statement is included in the qualifications and the substitution limits of training and experience are not clear within the qualifications statement, a note clarifying the limits must be used.

Where there are no acceptable equivalent combinations of training and experience that can be substituted for specialized minimum qualifications, the minimum qualifications should not contain the equivalency combination statement.

Whenever equivalency combination statements are used, the Job Analyst should establish equivalency equations for reference purposes only."

NOTE: IF AN EQUIVALENCY EQUATION CANNOT BE DEVELOPED FROM THE STRUCTURE OF THE MINIMUM QUALIFICATIONS STATEMENT, CHANCES ARE THE JOB ANALYST HAS A PROBLEM WITH THE LIMITS OF EDUCATION AND EXPERIENCE REQUIREMENTS PUT FORTH IN THE STATEMENT ITSELF!

Examples: Appendix I contains an entire reprint of the section of those aforementioned manuals which deal with the minimum qualification development process and which contain guidelines and examples of how to structure minimum qualifications. See the "Patterns" section of this appendix for examples of equivalency equations.

Equivalency equations are useful as a check on the substitution limits of what is meant by "an equivalent combination of training and experience.." and can be used to increase the job analyst's understanding of the effect of the minimum qualifications structure upon the interpretability of the minimum qualifications.

THE NEED TO DEFINE CRITICAL TERMS

Words can mean different things to different people. As a result, words can get in the way of communication unless we are very careful. It must be remembered that minimum qualifications must be read and understood not only by professionally trained personnel technicians and examination development staff, but also by potential candidate populations, i.e., the public at large. Jargon must therefore be kept to a minimum! Terms used in the minimum qualifications are to be defined according to standard sources within the appropriate subject-matter field (e.g., terms describing engineering practices shall be defined according to standard engineering sources, etc.).

OF PARTICULAR IMPORTANCE, THE CANDIDATES MUST BE ABLE TO READ AND UNDERSTAND WHAT THE SPECIFIC REQUIREMENTS ARE SO THEY CAN DETERMINE WHETHER OR NOT THEY MEET THE MINIMUM QUALIFICATIONS. DEFINITIONS ARE CRITICAL TO UNDERSTANDING AND MUST BE UNDERSTOOD BY ALL.

A list of commonly used terms is presented in Appendix II. This list is not intended to be exhaustive but simply a beginning. Job analysts can create their own lexicons that can be used to both document the definitions and terms currently used, and they can serve as a future reference for the development of other minimum qualification statements later. Job analysts can update their lexicons by adding definitions as needed to keep them current.

INTERPRETING MINIMUM QUALIFICATIONS

***We have a set of Minimum Qualifications and a
batch of candidate applications, now what...?***

THE NEED TO REVIEW AND OPERATIONALLY DEFINE THE MINIMUM QUALIFICATIONS EQUIVALENCY EQUATION

Before the job analyst attempts to interpret a set of minimum qualifications, the job analyst must first determine:

- The lowest level of education required;
- The lowest level of experience required; and
- If one could qualify by "an equivalent combination of training and experience," (the substitution limits).

Having defined these three factors, the job analyst should then develop a set of Equivalency Equations. See Appendix I "Patterns" section for examples of Equivalency Equations.

THE NEED TO REVIEW CRITICAL TERMS CONTAINED IN THE MINIMUM QUALIFICATIONS

Once the job analyst has a set of Equivalency Equations, the job analyst should then look at the minimum qualifications statement to see if the terminology used is understood. Are there words that need definition? If yes, the job analyst should now operationally define any and all ambiguous terms, i.e., define how the job analyst is going to use the term(s). In order to develop meaningful definitions, the job analyst may need to refer to the information aids/tools discussed in an earlier section of this report.

Keep a record of all definitions developed. These will provide a valuable resource later when reconstructing the basis for the job analyst's decisions as well as at subsequent times when the job analyst and others encounter the terms again.

THE NEED TO USE INFORMATION AIDS/TOOLS TO LEARN MORE ABOUT THE INFORMATION CONTAINED IN THE MINIMUM QUALIFICATIONS

The need to consider information sources is not, of course, restricted to the minimum qualification development process. If the job analyst must interpret qualifications developed by others, the job analyst will have to develop a similar base of understanding. Using the information aids and tools discussed earlier in this report, the job analyst will be able to develop necessary operational definitions of terms used, and when the job analyst encounters a candidate application containing either experience or training seemingly related to those under consideration, a review of the "tools of the trade" will assist the job analyst in determining whether or not the candidate's training or experience can be accepted.

In addition to providing information useful in developing definitions, the "tools" can also assist the job analyst with the problem of determining whether the candidate's training or experience is "related" if the ubiquitous phrase "...or related field" is included in the qualification statement. When comparing the knowledges needed in the specific minimum qualification training or experience against the knowledges offered by the candidate in whatever training or experience is listed on the application, the job analyst should be able to determine whether or not there is sufficient overlap to say that, "... Although the candidate's training (or experience) is not in any of the areas specified in the minimum qualifications statement, it is expected that the candidate would have gained the same knowledges, skills or abilities in one or more training (or

experience) entries on the application; therefore, the candidate's training (or experience) is sufficiently related and can be accepted." NOTE: For a discussion on the concept of "relatedness of training and experience," see **Appendix I, p. 20, paragraph numbered (3)**.

The job analyst's decisions need not be guesses. They can be justified or, at the very least, documented if the job analyst uses the tools available. Using readily available information tools will minimize the likelihood of the job analyst being wrong and will be extremely useful when reconstructing the job analyst's decisions if subsequently asked to do so.

THE PROCESS OF REVIEWING CANDIDATE CREDENTIALS

Everything thus far discussed in this report leads us to the ultimate critical decision that must be made..."Does this candidate meet the minimum qualifications for this job?" Or, to put it another way, "Will this candidate be able to perform the desired job if appointed?" Many factors will contribute to the answer of the latter question. All of these factors will lead us to our analysis and answer of the first..."Does this candidate meet the minimum qualifications for the job?"

It should be remembered that the application review of candidates' credentials and our judgments regarding minimum qualification determinations represents a process. That process is as follows:

1. Determine what the lowest training and experience requirements are.
2. Define the substitution limits, if any, of training and experience requirements by developing equivalency equations.
3. Define any terms need, using available information "tools."
4. Consider the candidate's training and experience to see if he or she has both the type(s) and amount(s) of each as required by the minimum qualifications statement.

Remember, every application the job analyst reviews represents a person's expression of interest in a job; every minimum qualification decision the job analyst makes is critical for each of these individuals!

APPENDIX

- I – MINIMUM QUALIFICATIONS GUIDELINES AND PATTERNS FOR DEVELOPING EQUIVALENCY EQUATIONS***

- II – LEXICON***

- III – SME WORKSHEET - JOB KSA LINKAGE TO EDUCATION AND / OR EXPERIENCE FACTORS***

- IV – BIBLIOGRAPHY***

APPENDIX I

MINIMUM QUALIFICATIONS GUIDELINES AND PATTERNS FOR DEVELOPING EQUIVALENCY EQUATIONS

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The level of minimum qualifications is derived from an analysis of the full performance knowledges, skills, abilities, and personal characteristics (KSAPs) section of the specification. Minimum qualifications should establish the lowest level of acceptable training and experience. ***The qualifications should be such that it would be reasonable to expect individuals having less training and experience not to be able to satisfactorily perform, or learn to perform, the duties of the position.*** Care should be taken when establishing minimum qualifications that they do not present artificial barriers to employment, both educational and experiential.

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In determining minimum qualifications, first consider experience requirements from two aspects: variety and length. The job analyst considers the types of experience in which an individual can be reasonably expected to gain the KSAPs required for full performance of the class. The variety of experience that would fit might not be immediately apparent. Care should be taken in the identification and description of appropriate experience. A poorly structured minimum qualifications statement may result in loss of potentially effective employees.

Similar care should be given to the determination of the required length of experience. This determination should be a conscious decision based upon the KSAPs requirements of the class. The job analyst should ask such questions as, "Is 10 years' experience really better than 5 years' experience in gaining basic technical KSAPs in this field?" "If we are looking for supervisory ability, should we require non-supervisory experience?"

The job analyst should consider (1) the type and level of education and/or training required to cover those KSAPs not covered by the experience requirements, and (2) the type and level of education and/or training that may be substituted for part or all of the experience requirement.

1. In the determination of appropriate experience, consider the experience in light of the required KSAPs. For example, if the class being described is primarily administrative in nature and the duties require knowledge of administrative principles and practices, budgetary and fiscal administration, personnel administration and labor relations, etc., consider experience in jobs which are administrative and require similar knowledges, skills and abilities in the performance thereof.

MINIMUM QUALIFICATIONS--cont'd.G
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With respect to related experience, consider jobs which involve the application of the required KSAPs in the performance of the duties thereof. The determination of appropriate-related experience should be based upon other jobs whose duties would provide experience in the use of similar KSAPs. (For a discussion of a concept of relatedness, see the Note following #2.)

2. In the determination of appropriate education and/or training qualifications, consider the KSAPs. For example, if the job is primarily administrative and requires knowledge of administrative principles and practices, budgetary and fiscal administration, etc., consider those programs which would result in the acquisition of the stated KSAs; e.g., public administration, business administration. etc.

Select programs which cover basically the same KSAPs areas; i.e., the determination of appropriate-related programs should be based upon knowledge of other curricula which result in the learning of similar KSAs.

NOTE - The concept of relatedness of experience and training is utilized in recognizing the fact that there are jobs or training programs which, although not identical in nature, would result in the performance of duties requiring the same KSAs, or which would result in the learning of the desired KSAs. Depending upon the specific duties to be performed or the knowledges, skills and abilities to be learned, there may or may not be related experience or training which can be substituted.

3. When structuring qualifications, education and/or training requirements should be listed first and then the experience requirement.
4. Possession of a high school equivalency diploma is considered equivalent to graduation from high school, and it should be stated in the specification as: "Graduation from high school, or possession of a high school equivalency diploma."
5. Careful consideration must be given to the listing of educational requirements. The job analyst must decide if possession of a degree is necessary. If formal study is necessary, the job analyst must further determine if specific course work should be required. Depending upon the KSAPs demands of the position, a job analyst may arrive at any of the following requirements: Possession of a Bachelor of Arts Degree in (specify major), four years of college study with a major concentration in (specify major), or college study to include at least (18) credit hours in (specify course work).

The identification of major concentrations must be given due consideration. The Job Analyst should be as specific as possible. For example, if a job requires the KSAPs commensurate with those gained in a Civil Engineering degree program, the position should require a degree in Civil Engineering and not simply Engineering.

MINIMUM QUALIFICATIONS--cont'd.

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Identification of specific curricula in the minimum qualifications should also be given careful and deliberate consideration. The job analyst should develop a working definition of the required curricula, and should specify the defined curricula on the announcement. Particular care should be taken whenever broad or potentially misunderstood curricula requirements are listed; e.g., social science, human resources, etc. If, under the heading of "social science," the job analyst has determined that degrees in Sociology, Psychology, or Economics would be appropriate but degrees in Political Science, History or Anthropology would not, the job analyst should state such on the specification.

Example:

Minimum Qualifications: Either

- (a) Graduation from a regionally accredited or New York State registered four-year college or university with a bachelor's degree in public or business administration, social science,* or human resources; or
- (b) . . .; or
- (c) An equivalent combination of training and experience as defined by the limits of (a) and (b).

*NOTE - Degrees in the following social science concentrations will not be accepted: Political Science, History or Anthropology. Degrees in Human Resources should have major concentrations in any of the following areas: Social Work, Social Welfare, Vocational and/or Psychological Counseling, or Educational Psychology.

- 6. Definitions of specific curricula listed in the qualifications can be developed by consulting representative college catalogues. The definitions can be based upon the subject matter covered in the curricula descriptions. Definitions of specific curricula are not included in the specification. Job analysts should develop a working definition of the curricula utilized and retain the definition on file with information pertaining to position classification and job analysis.
- 7. The structure of minimum qualifications should establish the lowest acceptable limit of the appropriate experience and/or training qualifications. The "equivalent combination" statement should be used, where appropriate, to allow for alternative experience and/or training combinations.

MINIMUM QUALIFICATIONS--cont'd.G
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Equivalency of training and experience must be interpreted in accordance with the total statement of minimum qualifications. Where specialized, training and/or experience is required, possession of "equivalent training and experience" cannot be used as a substitute for the required specialized experience and/or training. For example:

Minimum Qualifications: Either:

- (a) Graduation from a four-year college or university with a bachelor's degree in _____ and one year of specialized experience as _____; or
- (b) Graduation from high school or the possession of a high school equivalency diploma and five years of specialized experience as _____; or
- (c) An equivalent combination of training and experience as defined by the limits of (a) and (b).

NOTE - Individuals must possess at least a high school diploma or its equivalent as well as at least one year of appropriate experience; additional training beyond the bachelor's degree level (i.e., master's degree) cannot be substituted for the year of required experience; additional experience beyond five years cannot be substituted for the high school requirement.

The equivalency statement above would admit candidates between training and experience qualifications. The minimum Education/Training requirement is high school; the minimum experience requirement is one year.

- 8. Where equivalency combinations are used, include the following statement: "An equivalent combination of training and experience as defined by the limits of (a) and (b)."
- 9. Where there are no acceptable equivalent combinations of training and experience which can be substituted for specialized minimum qualifications, the minimum qualifications should not contain the equivalency combination statement.
- 10. Whenever equivalency combination statements are used, the job analyst should establish equivalency equations for reference purposes only. They should not be included in the specification (see examples).
- 11. To accept part-time or volunteer experience as qualifying, the minimum qualifications **MUST** contain a statement stating such. Unless the minimum qualifications statement specifically allows part-time or volunteer experience, the interpretation given to "experience" is "full-time paid experience" only. If a decision has been made to accept part-time or volunteer experience, use the following statement format:

"() years of full-time experience or its part-time/volunteer equivalent."

MINIMUM QUALIFICATIONS--cont'd.

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- 12. Where a class requires specialized experience within a total of experience, state it in the following manner:

"Five years of recreation administrative experience including at least ____ years of supervisory experience."

If there is an equivalent combination statement, it should indicate whether additional training may be substituted for the required specialized experience.

NOTE - Experience as (specify) can be substituted for training beyond the associate's degree level on a year-for-year basis.

- 13. Although qualifications contained in the specification are usually developed on an open-competitive basis, it may be desirable at times to list promotion qualifications as well. In such instances, use one of the following statements when appropriate:

Promotion: "Two years of permanent competitive class status as a Clerk, Typist or Stenographer."

Promotion From Non-Competitive Class (§52.14): "Two years of non-competitive class service as a Motor Equipment Operator."

Following are examples of minimum qualifications and equivalency description:

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- 1. Where a class requires either specific experience or formalized training in a specific area, use the following pattern

MINIMUM QUALIFICATIONS: Either:

- (a) Graduation from a regionally accredited or New York State-registered two-year college or university with an associate's degree in (specify major if appropriate); or
- (b) Graduation from high school or possession of a high school equivalency diploma and (two) years of experience as (specify); or
- (c) Four years of experience as (specify); or
- (d) An equivalent combination of training and experience as defined by the limits of (a), (b) and (c).

MINIMUM QUALIFICATIONS cont'd.

(EQUIVALENCY EQUATION)

The following equivalency equation has been derived from the structure of the above minimum qualifications:

- Two years of college (a) =
- One year of college and one year of experience =
- Twelfth grade and two years of experience (b) =
- Four years of experience (c).

2. Where it has been determined that a position requires specific training, but experience (in a specific area) can be substituted for some, but not all, of the training, use the following pattern:

MINIMUM QUALIFICATIONS: Either:

- (a) Graduation from a regionally accredited or New York State-registered four-year college or, university with a bachelor's degree in (specify); or
- (b) Graduation from a regionally accredited or New York State-registered two-year college or university with an associate's degree in (specify) and two years of experience as (specify); or
- (c) An equivalent combination of training and experience as defined by the limits of (a) and (b).

(EQUIVALENCY EQUATION)

The following equivalency equation has been derived from the structure of the above minimum qualifications:

- Four years of college training (a) =
- Three years of college training and one year of experience =
- Two years of college training and two years of experience (b).

3. Where it has been determined that a position requires at least high school training as well as at least a year of experience in a specific area, use the following pattern:

MINIMUM QUALIFICATIONS: Either:

- (a) Graduation from a regionally accredited or New York State-registered two-year college or university with an associate's degree in (specify major as appropriate) and (one) year of experience as (specify); or
- (b) Graduation from high school or possession of a high school equivalency diploma and (two) years of experience as (specify); or
- (c) An equivalent combination of training and experience by the limits of (a) and (b).

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MINIMUM QUALIFICATIONS—cont'd.

NOTE: (One) year of experience is required and additional training beyond the associate's degree level cannot be substituted for this year of experience.

(EQUIVALENCY EQUATION)

The following equivalency equation has been derived from the structure of the above minimum qualifications:

Two years of college training and one year experience (a) =
One year of college training and one and one-half years of experience =
Graduation from high school or possession of a high school equivalency diploma and (two) years of experience (b)

- 4. Where it has been determined that a position requires graduation from a four-year college or university with a bachelor's degree in a specified area and there is no appropriate experience which can be substituted for such training, use the following pattern:

MINIMUM QUALIFICATIONS: Graduation from a regionally accredited or New York State-registered four-year college or university with a bachelor's degree in (specify major, if appropriate).

NOTE: Experience cannot be substituted for the required bachelor's degree.

(NO EQUIVALENCY EQUATION)

- 5. Where it has been determined that a position requires specific experience and there is no training program which can be substituted for such experience, use the following pattern:

MINIMUM QUALIFICATIONS: () years of experience as (specify).

NOTE: Training cannot be substituted for the required experience.

(NO EQUIVALENCY EQUATION)

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MINIMUM QUALIFICATIONS--cont'd.

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Following are examples of minimum qualification statements:

Equivalency equations are listed after the example for your information.

SHELTERED WORKSHOP PRODUCTION SPECIALIST

MINIMUM QUALIFICATIONS: Either:

- (a) Graduation from high school or possession of a high school equivalency diploma and two years of line experience in a manufacturing firm primarily involved in the production of wood or metal products; or
- (b) Six years of line experience in a manufacturing firm as described in (a); or
- (c) An equivalent combination of training and experience as defined by the limits of (a) and (b).

NOTE: A high school degree is equivalent to four years of experience. At least two years of line experience is required and additional training beyond high school cannot be substituted for these two years of experience.

(EQUIVALENCY EQUATION)

High school graduation or equivalency diploma and two years of experience (a) =
 3 years of high school education and 3 years of experience =
 2 years of high school education and 4 years of experience =
 1 year of high school education and 5 years of experience =
 6 years of appropriate experience (b).

EMPLOYMENT AND TRAINING COORDINATOR

MINIMUM QUALIFICATIONS: Either:

- (a) Graduation from a regionally accredited or New York State-registered four-year college or university with a bachelor's degree with major concentration in public or business administration, behavioral science, human services, personnel, or industrial or labor relations, or related field; or
- (b) Six years of experience in job or training development and analysis, personnel counseling or placement, public or business administration, economics, labor or industrial relations, or related field; or
- (c) An equivalent combination of training and experience as defined by the limits of (a) and (b).

NOTE: Educational training beyond high school can be substituted for experience on a year-for-year basis.

(EQUIVALENCY EQUATION)

MINIMUM QUALIFICATIONS--cont'd.

E
X
A
M
P
L
E
S

O
F

M
I
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M
U
M

Q
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S

The following equivalency equation has been derived from the structure of the above minimum qualifications:

Graduation from a four-year college with an appropriate degree* (a) =
Three years of appropriate college training and one year of appropriate experience** =

One year of appropriate college training and three years of appropriate experience =

High school graduation or possession of a high school equivalency diploma and four years of appropriate experience = Six years of appropriate experience (b).

- * - The following are examples of degree concentrations which have been determined to be related by consulting curricula descriptions of representative New York State colleges and universities: psychology, sociology, economics and political science.
- ** - The following are examples of occupational fields which have been determined to be related by evaluation of the duties and required knowledges, skills and abilities of the position: social work experience, vocational, and/or psychological counseling and education psychology experience.

APPENDIX II LEXICON

Account Clerical - under close supervision, performs routine, repetitive tasks of a fiscal nature in accordance with prescribed procedures. Account clerks make entries in a book of account or other record. Posting to accounts may be manual or computerized. In general, an account clerical position does not differ significantly from a bookkeeper in that both do double-entry bookkeeping. Positions that primarily involve checking invoices or performing calculations are not considered account clerical.

Note: If account clerical/bookkeeping experience is considered qualifying, it should be clearly stated in the qualifications.

Accounting – professional level position which involves the art of recording, classifying, verifying and reporting financial data and presenting an analysis or interpretation of their significance. Its function is to provide quantitative information, primarily financial in nature, about economic entities that is intended to be useful in making economic decisions and in making reasoned choices among alternate courses of action. It includes the preparation of financial statements and schedules.

Typical work activities performed by persons in accounting positions include:

1. Prepares financial statements from accounting records. This may involve maintenance of a varied and complex set of accounting records, posting entries to these books from supporting records, and making adjustment entries.
2. Verifies, codes and classifies financial transactions following established and accepted accounting methods and procedures.
3. Conducts detailed accounting system surveys to determine the adequacy of current systems and recommends any needed changes.
4. Under the supervision of a higher level accountant, or independently, revises or develops new accounting systems and procedures in order to provide a clear audit trail of financial transactions.
5. Prepares a variety of tax, financial and statistical reports and analyses to comply with State and Federal requirements and to provide pertinent information for decision making.
6. Reviews internal control accounting systems to ensure that adequate safeguards exist for the proper monitoring of accounts.
7. Reviews existing accounting procedures to determine compliance with pertinent laws and regulations, as well as generally accepted accounting principles.

Administration - responsible direction and control of an identifiable organizational unit or program; in addition to the supervision of work groups, an administrator is involved in planning, resource allocation, program evaluation and policy formulation. Experience performing specialized functions or “staff activities” such as budgeting, finance, administrative analysis or personnel, which do not involve the aforementioned responsibilities, are not considered administration experience. (If experience performing “staff” functions is acceptable, such experience should be specified on the minimum qualifications. See the discussion of staff administrative experience on page 18.)

Apprenticeship - a prescribed period of time during which a person receives both classroom and on-the-job training to prepare for a trade. The New York State Department of Labor recognizes certain apprenticable occupations and prescribes specific training requirements.

Auditing - the art of confirming financial statements for the purpose of expressing an opinion that these statements fairly represent the financial condition of the enterprise and its operating results, and further that these statements are presented to conform with generally accepted accounting standards in a consistent manner. Auditing is the art of documenting the veracity of financial data; it includes a critical review of internal controls, a systemic examination and verification of financial records and documents, and an appraisal of fiscal procedures and operations.

Behavioral Sciences - coursework or experience in psychology, sociology and anthropology, counseling, criminal justice, gerontology, human behavior, social work/social welfare and vocational rehabilitation. A subset of social science, behavioral sciences are characterized by observation of the behavior of living organisms and focused on human social behavior.

Biological Sciences - courses may include biology, microbiology, botany, zoology and other related courses containing the study of living organisms.

Bookkeeping - classifying and recording financial data in books of account in a routine, repetitive fashion in accordance with an accounting system devised and developed by an accountant or an auditor. Bookkeeping is a higher level than an account/audit clerical position in that bookkeeping involves double-entry. Double-entry means that for every action that is recorded, two accounts are changed, e.g., the business buys equipment: debit cash (or accounts payable), credit equipment inventory. A bookkeeper records transactions in a specific manner (journalizing), transfers amounts from a journal to a ledger or book of accounts (posting) and takes trial balances. A bookkeeper usually works the accounts through the trial balance and possibly the profit and loss statement (P&L). Only keeping accounts receivable and/or accounts payable is not double-entry bookkeeping.

Building Cleaning - activities primarily involve a variety of inside and outside building cleaning activities including, but not limited to, washing walls and windows, polishing floors, cleaning restrooms, disposing of refuse.

Building Construction - general construction work involves building, repairing and/or modernizing buildings, houses, and other structures and their surroundings. This is work that is generally done by a skilled person. A general contractor often does not do all the work above and frequently "contracts out" work installing the mechanical elements: plumbing, electrical, heating, ventilating and air conditioning work, etc. A general contractor bids on jobs and supervises an entire project which may be the construction of a building from clearing the site to finishing the interior. Performance of only one specialized trade such as an electrician, carpenter, or plumber would not constitute qualifying experience for general contracting.

Building Trades - activities primarily involve the performance of a variety of skilled construction and/or maintenance tasks in areas including, but not limited to, carpentry, plumbing, electrical, or air conditioning and heating systems. Frequently a distinction is made in the basic or structural building trades from the specialty trades which include the finished and the mechanical trades. The former category includes all those trades which contribute to the erection of a building (not concerned with architectural aspects) i.e., the shell without the contents. Structural trades then include masons and bricklayers, rough carpenters, iron workers, millwrights and pile drivers, as

well as heavy equipment and crane operators. Specialty trades in the finished trades area include finishing carpenters, glaziers, marble and tile workers, painters and plasterers, roofers and sheet metal workers. Specialty trades in the mechanical trades area include plumbers and steam fitters, and heating, ventilating and air conditioning installers.

Due to these distinctions between trades, it is important to be specific when writing minimum qualifications and/or reviewing applications. In some instances only a few of the building trades may be appropriate to the position, not all the building trades.

Business Administration - work experience (usually paid) that involves responsibility for the coordination and direction of human, physical and financial resources. This experience involves identifying problems, obtaining and analyzing relevant information and determining and implementing solutions. Such experience involves decision-making with significant consequences in a combination of areas such as organizing priorities, evaluating and acting on financial records, financial and managerial accounting, organizational behavior, etc. Experience limited to a single discipline, such as accounting or record retention, would not be qualifying.

Casework – see Social Casework.

Clerical - activities involve the performance of routine office tasks, such as keeping of records and accounts, correspondence, recording/entering (keying) and retrieving data and/or information, in accordance with prescribed procedures.

Clinical Laboratory – a facility for the examination of materials derived from the human body for the purpose of obtaining information for the diagnosis, prevention or treatment of disease or the assessment of medical condition. The New York State Commissioner of Health issues permits that authorize a facility to perform particular types of tests. Categories of tests that can be performed are designated according to the following procedures or specialties:

- (1) one or more of the following subspecialties of microbiology: bacteriology, virology, mycology, parasitology and mycobacteriology;
- (2) hematology;
- (3) blood services—diagnostic immunohematology collection and/or transfusion;
- (4) one or more of the following subspecialties of clinical biochemistry: clinical chemistry, blood pH and gases, endocrinology and therapeutic substance monitoring/quantitative toxicology;
- (5) histopathology or one more of the following subspecialties: dermatopathology and oral pathology;
- (6) cytopathology;
- (7) urinalysis;
- (8) one or more of the following subspecialties of toxicology: drug analysis-qualitative, blood lead and erythrocyte protoporphyrin, forensic toxicology, and chlorinated hydrocarbons;
- (9) cytogenetics;
- (10) human immunodeficiency virus (HIV) testing;
- (11) histocompatibility;
- (12) diagnostic immunology;
- (13) cellular immunology;
- (14) oncofetal antigens.

Clinical Psychology – consists of direct patient treatment (as opposed to counseling) or therapy provided in a mental health setting. A school psychologist would not usually be credited with experience in clinical psychology; as such, experience is generally counseling, guidance and/or testing in a school setting.

Community Action Programs (CAP) - these are programs in which urban or rural communities mobilize their resources to combat a problem, typically poverty. A vital feature is that residents of the areas served and members of the group to be served are significantly involved in the planning, policy-making and operation of the program. Established ongoing governmental agencies are rarely CAPs but may be part of the resources a CAP would use.

Community Organization - an accepted field of social work practice which involves a change agent (the community organizer) and a social system (a community). The community organizer actively facilitates the identification of needs, the establishment of priorities, the location of the appropriate resources, and the taking of action by the community with respect to the particular constellation of needs, resources, and priorities.

Community Relations - informal, direct personal contact with other agencies and community groups for needs assessment, policy explanation, and interpretation of community attitudes and goals. It is essentially community organization or outreach oriented. Community relations work may include aspects of public relations, such as informing the public of the work an agency does and the programs it has available through speeches, newspaper articles, press releases and radio and television announcements; seeing that the public understands the agency's point of view on issues; evaluating community attitudes; and establishing outlets to publicize the agency's work.

Computer Laboratory Technician - provides assistance to students using microcomputers in a school or learning center computer laboratory, renders advice and technical assistance to students and staff using the computers, may oversee scheduling of the laboratory, performs maintenance and repairs to equipment, previews new software and/or hardware and learns how to use them, and keeps records of hardware, software and other supplies.

Computer Operator - operates a mainframe or personal computer (PC) system and associated peripheral equipment in a computer center. Computer operators do such jobs as aligning printed forms on line printers or mounting magnetic tape reels (or cartridges) on tape drives. They may also exercise control over the sequence in which jobs are executed, respond to messages from the computer operating system, and ensure accuracy of output. Entry-level computer operators are sometimes called peripheral equipment operators, and senior-level computer operators are sometimes called console operators. (Performance of data entry or word processing is not considered computer operation.)

Computer Programmers - there are two main types of programmers:

- (1) **Applications Programmer** - writes, tests, modifies, and maintains programs, which are sets of instructions, to solve specific business or organizational problems. Applications programmers work from developed specifications of the problem(s) to be solved or the report(s) to be produced. The specifications may be provided by the systems analyst or developed by the programmers working with a program area. Typical application programs are for payroll and personnel systems.

- (2) **Systems Programmer** – develops, installs, modifies and maintains systems software. Systems software are programs used to control the computer and to develop and run applications programs. Systems software includes operating systems, TP monitors, network operating systems, and data base managers, etc.

Continuing Education – formal coursework, in-service education, professional convocations, seminars, etc.) designed to help maintain skills and keep abreast of the field of work.

Counseling – involves interviewing individuals and/or families, discussing and evaluating their problems (e.g., drug and alcohol abuse, family conflicts, disabilities) and developing and carrying out plans to resolve problems. Those who perform counseling duties work directly with individuals and/or families on an ongoing basis in order to assist them and monitor and evaluate their progress.

Data Base Administrator – responsible for all activities associated with the design, development, installation and performance of an organization's data bases. Data Base Administrators define the form and content of data bases; determine the most efficient way of organizing the data; set up standard definitions and names for the various records and fields; and oversee the security system for the data base. The Data Base Administrator is responsible for controlling what data elements are placed in the data base, who can have access to it, how it is structured and interrelated, and what items are deleted.

Data Communications Specialist - performs data communications network design, analysis, capacity planning, installation, monitoring, performance evaluation, tuning and maintenance. The network(s) include all data communications hardware, software and communication facilities required to receive and transmit data on an inter and intra-agency basis. This equipment includes modems, diagnostic equipment, hubs, bridges, routers, multi-plexors, data switches, front-end processors, gateways, servers, minicomputers, personal computers, printers, etc.

Data Communications Systems – computer systems that transmit data over communication lines such as telephone lines or coaxial cables.

Data Control Clerk - logs in work received at a computer center, seeing that it reaches each work station on schedule, and assuring that completed work and reports are distributed to the proper persons.

Data Entry Machine Operator - involves transcribing data into a form suitable for computer processing. The operator uses a keyboard to transfer data from source documents to magnetic tape or disk. Production oriented positions primarily involve the entry of large amounts of alphanumeric data from batches of source documents; successful job performance requires a high level of speed and accuracy. Non-production positions are most often referred to as data base clerical jobs. Incumbents perform a variety of tasks including, but not limited to, searching a data base for information, updating existing records and entering new records, and doing so with single records or small groups of records. When data entry is done, accuracy is more important than speed.

Data Processing - a generic term that is broad enough to include a wide variety of clerical and professional computer activities including, but not limited to, computer operations, computer programming, office automation, data entry and data control. The term also encompasses a wide range of computer and computer-related equipment.

If experience is desired in a specific area of data processing or in operating a particular type of equipment, it should be specified. Also, if experience in operating specific equipment or performing another activity (e.g., programming) is necessary, this should also be stated.

It is important to note that a degree with a major in Data Processing may not always be equivalent to a degree in Computer Science. The former tends to emphasize the practical applications of data processing to office automation and information processing. The latter may emphasize the theoretical aspects of data processing and may be geared toward computer programming and systems analysis. If specific computer science courses are required for a particular class, each data processing course description must be evaluated on a course-by-course basis.

Education Degree – a course of study that prepares persons to teach a curriculum to students. The phrase “Education Degree” may be interpreted differently by various persons and the degree can include a wide variety of curricula. The use of the term “Education Degree” should be carefully considered when structuring minimum qualifications. If teaching knowledge/skills/abilities are desired, then “certification as a classroom teacher” may be required. If educational supervision/administration skills are needed, then a “degree in educational supervision/administration or a closely related field” or “certification as a school instructional supervisor/administrator” should be specified. If specialized skills (e.g., School Guidance, Library-Media Specialist, Psychologist, etc.) are needed, then the appropriate degree or certificate should be specified. (See College Blue Book-Degrees Offered by College and Subject for degrees offered.)

Education degrees are not considered social science degrees.

Engineer, Professional – the State Education Law sets forth rules for the practice of engineering; a license and current registration as a Professional Engineer in New York State is required to practice engineering, which is defined in law as performing professional service such as consultation, investigation, evaluation, planning, design or supervision of construction or operation in connection with any utilities, structures, buildings, machines, equipment, processes, works or projects wherein the safeguarding of life, health and property is concerned, when such service or work requires the application of engineering principles and data.

Engineering Experience (Paraprofessional Level) - involves carrying out routine, subprofessional engineering-related tasks by the application of specified procedures and formulas, usually working under the supervision of an engineer. If qualifying experience is required to be in a particular specialty such as civil engineering, that needs to be stated in the qualifications. Persons working at this level are most often called Engineering Technicians. Examples of work typically performed include:

1. Collection of field data on traffic, soil and water conditions and material characteristics;
2. Preparation of engineering drawings, drafting and tracing plans;
3. Preparation of data summaries and engineering computations and analysis;
4. Routine aspects of land and construction surveys;
5. Monitoring of engineering processes and application of adjustment rules.

Engineering Experience (Professional Level) - that experience which requires the intensive application of engineering principles in the practical solution of engineering problems. This work shall predicate a knowledge of engineering mathematics, physical and applied sciences,

properties of materials and the fundamental principles of engineering design. Professional level engineering work may include consultation, investigation, evaluation, planning, design or responsible supervision of construction or operation, in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works, or projects. Experience in materials testing, drafting, land surveying and engineering technician duties would not be considered professional engineering. There are numerous disciplines in Engineering as reflected in degrees and work experience. Consideration should be given as to what disciplines/types of experience will be appropriate training/experience for a class, or if all disciplines will be qualifying.

The following is an overview of a sample of engineering disciplines:

- A. Agricultural Engineering - Engineers are involved in every phase of agriculture from production of plants and animals, to the final processing of food feed, and fiber products.
- B. Biomedical Engineering - Biomedical Engineers are members of health and research teams who apply the principles of engineering, physics, and technology to understanding, defining, and solving problems in biology and medicine. These Engineers develop concepts and convert the ideas of physicians, rehabilitation therapists, and biologists into usable devices for improving the quality of life.
- C. Chemical Engineering - Chemical Engineering is, in a broad sense, a professional endeavor that bridges the gap between scientific knowledge and manufactured products. Chemical Engineers concern themselves with the application of chemical, physical, and engineering principles in the production of such materials as plastics, synthetics, and pharmaceuticals, which undergo chemical change during processing.
- D. Civil Engineering - Civil Engineering involves the planning, design, construction and maintenance of structures and facilities such as tunnels for vehicular traffic, bridges, buildings, dams, airports, docks and works for water purification.

Civil Engineers are engaged in coping with the complexities of public health, sanitation, traffic flow in urbanized areas and city planning. They plan and design bridges, highways, and other means of transportation required to satisfy identified needs. Civil Engineers also harness, control and utilize water resources for irrigation, power production and human consumption.

- E. Computer Engineering - Computer Engineering has a professional relationship to Electrical Engineering. Computer Engineers operate sophisticated software and may design, produce and maintain the equipment. Computer Engineers deal with the design, construction and utilization of electronic computers.
- F. Electrical Engineering – The Electrical Engineering profession has evolved from its early beginning in electrical power generation and distribution through the development of radio to television and computers. Electrical Engineering deals with electricity. The field is concerned with electrons, magnetic fields and electric fields--invisible phenomena. It is a broad field with two major stems--Electrical and Electronics Engineering. Some Electrical Engineers work on efficient generation and reliable distribution of electrical power, others specialize in the design of circuits and

systems for communications and computers, and still others apply their knowledge in the collection and interpretation of biomedical information.

- G. Environmental and Sanitation Engineering - Environmental and Sanitary Engineers have as their first concern the protection of the environment and safeguarding of public health.

Both of these disciplines evolved as branches and specializations of Civil Engineering. They are involved in the construction and maintenance of sanitary sewer systems, and the construction, maintenance, and operation of water pollution control or sewage treatment plants and facilities. With more stringent federal requirements, higher levels of treatment necessitate more complex plants and modern testing methods.

- H. Industrial Engineering - The basic objectives of the field relate to productivity--that is, what is the most effective use of each dollar spent for materials, equipment, manpower, etc. The uniqueness of the Industrial Engineer's training is brought about by the combination of topics related directly or indirectly to productivity, balanced with engineering science, physical science and mathematics.
- I. Nuclear Engineering - Nuclear Engineering is the branch of the engineering profession concerned with the practical applications of nuclear energy--that is, the energy emanating from the atomic nucleus. This may involve development of nuclear power for ships; application of radiation sources in the diagnosis and treatment of diseases; application of nuclear explosives to underground utilization of natural resources; potential use of radiation processing for production and preservation of food supplies; use of nuclear energy systems to reduce environmental pollution; development of nuclear power plants which operate with the dual purpose of producing power and desalting water; and development of power plants for space exploration.
- J. Traffic Engineering - It involves the planning, design, and operation of road/highway transportation systems. Attention is focused upon safety and capacity characteristics.

Engineering Technology - this course of study places less emphasis on theory than a traditional engineering curriculum. Coursework emphasizes the application of traditional technologies within engineering fields. For example, construction techniques and equipment, surveying, hydraulics, soil mechanics/analysis, and environmental controls/treatment may be within a civil engineering technology program. An engineering technology major may be in a specific discipline, such as mechanical, electrical or civil. The degree is most often awarded at the associate's level, but there are some bachelor's degree programs.

Environmental Laboratory – any facility that examines, or is available for the examination of, samples or specimens, including, but not limited to: air, stack emissions, water, wastewater, surface water, ground water, recreational waters, swimming pools, leachate, land runoff, solid waste, hazardous waste, soil, sediments and vegetation, as well as any substance that could contribute to the pollution of or that could be contaminated by material contained in such samples or specimens. The examinations are limited to qualitative or quantitative determinations of the biological, chemical, radiochemical or physical characteristics of the samples or specimens for the purposes of public health or personal health protection, or the

protection of the environment or natural resources. Environmental laboratories may be mobile, but do not include facilities or entities that perform non-laboratory chemical testing associated with residential water softeners and residential swimming pools. Note: Environmental laboratories were formerly called Public Health Laboratories in the Health Code, Section 55-2.1.

Human Resource Management - focuses on the effective utilization of people at work. Human Resource Management is an extension of personnel and labor relations, but also includes the traditional areas of recruitment, selection, placement, classification, compensation, and training. The ultimate goal of a Human Resource Manager is to provide an organization with the people who will be most effective in its jobs.

Human Services – a term that can describe education or experience. In an education context, it is coursework or a major designed to prepare individuals to enhance and increase the well-being of our society and the individuals it comprises. The course of study must clearly focus upon giving the student the knowledge and capacity to deal with people in need of support services. It includes the “helping professions” such as social work, psychology, gerontology and vocational and/or psychological counseling, as well as therapeutic modalities such as occupational therapy, physical therapy, and therapeutic recreation. For purposes of definition, helping professions include those involved in social work; childcare; mental health; mental retardation; early childhood education; working with the elderly or terminally ill or individuals having learning disabilities.

Since some colleges offer majors in Human Services, the qualifications should make clear if the degree may be in any human service field or if it is the major that is required. Programs designed to prepare nurses and elementary and secondary school teachers as well as teachers in higher education are generally not considered human services; if it is the intent to accept education in any of these areas, the qualifications should specifically provide for it. In some occupations, there are federal and/or state guidelines that govern the use of the term "human services." Because of the variations in the use of the term "human services," special care should be taken when using this term in the minimum qualifications, whether for education or experience.

The same criteria that describe the parameters for human services in an education context should be applied in an experience context.

Human Services Major – a curriculum, most often offered at the associate’s degree level, with a special orientation to the helping professions. A “Human Services” major usually has a concentration in early childhood development, mental health, developmental disabilities, social services or gerontology. The goal is to prepare students for entry-level career positions in a variety of human services occupations such as mental health aides, group residence workers, neighborhood outreach workers, casework assistants, geriatric counselors, day care workers, or rehabilitation of the disabled.

Information Systems Manager (MIS) - manages all of an organization’s information resources. A management information system is usually designed as a computer-based system that is used to provide accurate information to managers to help in decision making.

Investigative Experience (Field) - this entails work in the field as well as office duties. The primary work activities include receiving complaints or reports of irregularities and conducting research into the background of the case and/or involved individual(s). Some of the facts and information checked might be: character, employment, educational, financial, or general

background of the individual(s). Complaints or case files involving a company or individual would also be checked.

The field work involves traveling to an office, home, place of business or other location deemed important to the investigation. The investigator tries to obtain the cooperation of the individuals believed to be involved in or possessing information about an investigation. Appointments are set up to interview persons such as complainants, witnesses and people under investigation. Data and evidence are gathered from these field visits, and statements and/or affidavits may be obtained from involved individuals and witnesses. The investigator may be required to testify in court or formal hearings.

The investigator will be required to write a detailed narrative report covering every aspect of the investigation, as well as making a recommendation concerning the disposition of the complaint or case. Finally, the investigator must keep neat, legible notes and files on each investigation so they may be used to aid future investigations. Work as a police officer performing patrol functions is not considered field investigation.

Medical Social Work - experience performing social work in an inpatient or community program for patients with primarily medical--as opposed to mental health--problems. Programs included in this definition cover a fairly wide range including hospitals, nursing homes, community health programs, rehabilitation programs and others which focus on health problems of individuals and their families.

Mental Health Social Work – social work experience in a residential or community-based program for individuals with mental illness, mental retardation, developmental disabilities, or alcohol or substance abuse problems. The following types of experience are NOT considered mental health social work: correctional counseling, parole or probation work, casework in a social services setting, school social work and/or youth outreach work. Work in a hospital or other health facility would not be considered mental health social work unless the work assignment dealt primarily with mental health problems. (For example, work in an alcohol detoxification unit or psychiatric section of a hospital would be considered mental health social work.)

Microcomputer – a broad term that describes a variety of desktop digital computers, all of which operate with a microprocessor (chip). A microcomputer includes storage and input/output capabilities; it has the ability to “process” information itself. The two most common types are PCs (personal computers) and Macintosh. The term PC refers to any IBM-compatible stand-alone (or networked) desktop computer. If experience with only one of these classes of desktop computers is acceptable, it should be clearly stated in the qualifications.

Microcomputer Technician/Specialist - provides a variety of technical support services, such as: installing, maintaining and repairing computers; analyzing needs for computer applications for new or expanded needs; instructing users in the operation of computer hardware and software or arranges for such training; providing technical assistance for selecting, adapting, modifying, upgrading and purchasing computer hardware and software; coordinating microcomputer activities, services and functions in a department or among departments. Jobs performing these duties have many different titles.

Natural Sciences: (Physical and Biological) – these are broad fields of science which contain more specific sub-fields. The following is a brief list of examples of subfields contained in the

broader fields. College catalogs should be consulted for descriptions of courses and specific programs.

BIOLOGY

General Biology
Microbiology
Genetics
Entomology
Parasitology
Marine Biology

EARTH SCIENCE

Geology
Hydrology
Meteorology
Astronomy
Marine Geology

BOTANY

General Botany
Physiology
Morphology
Pathology
Taxonomy

PHYSICS

General Physics
Solid State Physics
Astrophysics

CHEMISTRY

General Inorganic Chemistry
Qualitative Analysis
Organic Chemistry
Biochemistry
Quantitative Analysis
Physical Chemistry

ZOOLOGY

General Zoology
Comparative Anatomy
Physiology
Taxonomy
Invertebrate Zoology

Network Specialist/LAN Technician - administers a computer network(s); installs, operates and troubleshoots and repairs communications equipment such as microcomputers, terminals, printers and modems; acquires and installs equipment and software, sets up work stations, establishes security and backup procedures and monitors the network. Typical titles include Local Area Network Specialist, Network Administrator, Distributed Processing Technician, etc.

Office Manager - supervises and directs clerical employees; may hire and discharge subordinates. Coordinates the work of the office with other departments.

Paraprofessional - work activities involve the performance of routine duties in a supportive role to a professional, usually requiring less training and/or experience than normally required for professional status. Experience at this level does not have the breadth and depth of final job responsibility found in professional positions (such as in social work, planning, engineering, accounting, etc.) nor does it require the intensity or broad scope of job-related knowledge. Since there are significant differences in the nature of paraprofessional and professional experience, qualifications should clearly identify the level required for experience to be qualifying.

Personnel Administration - includes activities in areas such as classification and salary administration, recruitment, selection, placement of staff, and labor relations.

Note: Experience limited primarily to health insurance-related activities is generally excluded.

Physical Sciences – a subset of natural science which includes a wide range of fields of study in inorganic and organic chemistry, qualitative and quantitative analyses, biochemistry, astronomy, meteorology, geology, earth science and physics.

Planning Experience (Paraprofessional Level) – “paraprofessional” level involves carrying out straightforward tasks associated with the planning process, applying specific rules and regulations; incumbents usually work under the supervision of a planner. Titles most frequently used to describe work at this level are Planning Aide, Planning Assistant, and Planning Technician. Examples of work typically performed by a person working in the planning field at a paraprofessional level include:

1. Collection of field data on land use, historical resources, traffic, housing or building conditions;
2. Compilation of population, employment, housing or other socioeconomic data from secondary sources;
3. Preparation of summaries, analyses and data projections;
4. Preparation of maps and charts, graphs and tables;
5. Processing and reviewing applications to determine conformance with zoning and planning regulations.

Planning Experience (Professional Level) - “Professional” planning experience, whether acquired through practice, a degree, teaching or research, must address all four of the following criteria:

- A. Employing an appropriately comprehensive point of view. Appropriate comprehensiveness requires:
 - (1) looking at the consequences, e.g., physical/environmental, social, economic/financial governmental, etc.
 - (2) conforming a proposed decision to the larger context in which it will occur.
- B. Applying a planning process appropriate to the situation. The process must be appropriate to its place and situation in:
 - (1) the number and order of its steps, e.g., problem/opportunity definition, goal setting, generating alternate strategies, strategy choice, implementation, change, and to resource constraints;
 - (2) its orientation to the future, to value change, and to resource constraints;
 - (3) its quality of research and analysis;
 - (4) its format of policy, program, or plan proposal.
- C. Involving a professional level of authority, responsibility and resourcefulness. This includes initiative, judgment, substantial involvement and personal accountability for defining and preparing substantive elements of planning activities.

Planning experience usually involves influencing public decision-making in the public interest. This would involve recommending specific actions or choices to elected/appointed officials, private sector representatives, or others regarding public decisions concerned with social, economic, or physical change in the public interest.

Professional – experience which requires specialized and theoretical knowledge usually acquired through college education or through that experience and other training which provides comparable knowledge. “Professional” experience in general involves independence of action and personal responsibility for actions. In many fields, experience cannot be credited as professional if performed prior to obtaining the required degrees, licenses, certification, etc.; for example, Librarians, Nurses, and Attorneys. If it is determined that qualifying experience in a field needs to be at a professional level, that should be specified in the qualifications.

Program - an organized group of activities which are performed in order to accomplish a specific goal or carry out policy which is aimed at improving or changing existing conditions, practices or procedures, e.g., comprehensive training programs, preschool programs or mental health programs.

Programming Librarian - works with a programming team and does much of the clerical jobs, such as keeping layout forms for files and records, compiling programs, creates and keeps job control procedures, and maintains documentation.

Public Administration - relates to the formulation and implementation of governmental policies and programs. A degree in public administration is not training for specific tasks and positions. It is oriented toward the environment of public administration - law, the political process, the economy, and the major components of the administrative process, such as program planning and evaluation, policy analysis, financial management, personnel management, organizational development and executive leadership.

Public Health - the science and the art of preventing disease, prolonging life, and promoting physical and mental health through organized community efforts for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing service for the early diagnosis and preventive treatment of disease.

Public Health has three main areas of concern:

1. Health services (includes home health services)
2. Behavior modification and health education
3. Environmental hazards

Public Health Social Work – social work experience in a private or public community health program addressing individuals’ health-related problems and concerns. Experience in an inpatient setting will not usually be considered acceptable under this definition.

Public Relations – to be public relations experience, a position should include liaison activities with public officials, corporations, other agencies, news media, and the public. Duties may include planning, preparing and distributing written material designed to promote understanding or general knowledge about activities, services, policies or objectives.

Public Sector - that part of the economy which is owned and operated by a government. This includes authorities and non-profit organizations.

Records Management – the establishment and maintenance of records in accordance with laws, rules, regulations, agency policy or other established standards. Experience may include

record organization, review, storage, retrieval, disposition and/or similar activities. Filing is not record management.

Recreation Administration - involves responsible direction and control of an organization or major organizational unit involving recreation activities. In addition to supervision of work groups, typical critical duties in recreation administration include: developing, planning, and evaluating recreation activities to ensure maximum efficiency; training and evaluating subordinate staff; preparing and presenting the budget, as well as overall responsibility for resource allocation; planning and coordinating capital projects and improvement programs; and preparing and distributing publicity materials, as well as working with interested community organizations to promote recreation activities.

Recreation Workers - Recreation Workers plan, organize, and direct activities that help people enjoy and benefit from leisure hours. General recreation education/experience should not be confused with recreational therapists, who help individuals recover or adjust to illness, disability, or specific social problems.

Responsibility for a Program – making decisions with significant and broad consequences and being accountable for the program's procedures and work products or services resulting from such program. Responsibility should include one or more of the following: developing procedures and program goals; ensuring compliance with administrative guidelines and regulations governing the program; evaluating program effectiveness. These activities are distinctly different from those that typify individuals involved primarily in the delivery of service. Responsibility for a program does not mean responsibility for doing one's own job nor does it mean responsibility for any single task associated with the development and/or implementation of a program.

Skilled Trades - work activities in this group primarily involve applying basic knowledge to the performance of a variety of manual tasks, often involving hand and power tools in building, constructing or repair of structures, and/or motorized equipment according to standardized practices of a trade under general or close supervision of higher level skilled personnel. Journey-level experience in a skilled trade generally requires completion of an apprenticeship.

Social Casework - social casework (sometimes referred to as casework) includes those activities that are directed toward enhancing a client's abilities to cope with and to solve problems, and referral of clients to supporting resources and services. Functions include client assessment, problem identification, development, monitoring and revision of a plan for services, motivational support, counseling, crisis intervention, referral to social and support services, and coordination of services.

For the purposes of minimum qualifications considerations for standards involving positions with municipal social services departments, social casework experience necessarily requires an understanding of the multiplicity of services within the community which are available to the client and should not be so specifically limited to one or two service functions so that a broad range of potential needs of the client cannot be addressed within the social casework interaction.

Social casework differs from social work in that social work is usually professional post-MSW experience, while social casework is a broader area not requiring an MSW. Social casework does not include experience which is custodial in nature and/or which involves providing direct personal care to clients, such as nursing, nurse's aides or home health aides. It

also does not include experience gained in positions such as Probation Assistant, Community Service Worker, or doing benefits determination, e.g., Social Welfare Examiner.

Social Science (Major or Coursework) - those areas of study concerned with humans living in relation to other humans in a social environment including the following areas: anthropology, criminal justice, economics, geography, history, political science, psychology and sociology. Under this definition majors such as social psychology and in such areas as "Afro-American studies," "Judaic studies," "women's studies," "Asian studies," and "African studies" would be accepted. When evaluating coursework to determine if an applicant meets a requirement for a specific number of credit hours in the social sciences, the content of courses must be evaluated on a case-by-case basis rather than accepting all courses offered by a particular department. Given the wide variety of areas of study encompassed by the term "social sciences," only some majors/courses may be appropriate preparation for a class; some areas may be clearly inappropriate preparation. Any such areas identified should be clearly stated in the qualifications as required or not acceptable.

Social Work - experience as a professional Social Worker normally includes such job activities as client intake, screening, psycho-social assessment, developing treatment plans, implementing treatment strategies, and coordinating client referrals to other agencies in a variety of human service settings.

Both the National Association of Social Workers (NASW) and the New York State Education Department recognize the Master's Degree in Social Work as the primary educational requirement for certification for professional practice. Therefore, the term "professional social work" is most often interpreted to mean post-MSW counseling, casework and referral services.

Some Social Workers may specialize with a specific group or in a specific setting. The most common specialties include mental health social work, medical social work, public health social work and school social work.

- A. **Social Work Experience (Professional)** - In most cases, only post-MSW social work experience will be considered professional social work experience for the purpose of meeting minimum qualifications. In most cases, to be qualifying experience, it should cover a complete range of professional activities such as interviewing, assessment, planning, implementing and evaluating treatment, coordination of services and aftercare.
- B. **Social Work Supervision** - In order to be considered professional social work supervision experience, candidates must have supervised one or more professional MSW-level social workers or equally qualified clinical staff. Professional social work supervision will normally include such activities as clinical oversight of professional social work staff, staff training, and performance evaluation. Supervision of students in MSW or BSW programs, paraprofessionals, assistants, or clerical workers will NOT be considered professional social work supervision.

Staff Administrative Experience - is to be distinguished from Administration experience. Incumbents perform functions in a support role to higher level administrators. This could involve office management; participation in budget preparation and monitoring; personnel; administrative analysis, including involvement in the development and/or review of department-wide practices and procedures; evaluating departmental operations; participation in planning, management

activities; purchasing; public relations; and other similar functions. In contrast, “line” functions involve the delivery of services, or the day-to-day operations of a department.

Statistics - the science dealing with the collection, analysis, interpretation and presentation of masses of numerical data.

Supervision - responsible direction and control of subordinate employees. This involves a responsibility for planning for individuals in a work group. Typical duties may include, but are not limited to, assigning and reviewing work, evaluating performance, maintaining work standards, motivating and developing subordinate employees, implementing procedural changes, increasing efficiency and dealing with problems of absenteeism, morale and discipline. The supervision aspects must be an integral part of the job, not incidental or occasional.

True supervision (e.g., first-line supervisors as opposed to “lead workers”) is characterized by:

1. the close and immediate supervision of permanently assigned employees, on a regular, ongoing basis;
2. responsibility for the assignment and review of work, providing work instruction, the evaluation of work performance, maintenance of work standards, handling absenteeism, discipline, etc.;
3. accountability for the quantity and quality of subordinate’s work and/or the completion of projects and program accomplishments.

Surveying - that branch of the engineering profession that applies mathematics to the measuring and plotting of the dimensions and areas of any portion of the earth, including all naturally placed and man or machine made structures and objects thereon. A licensed Land Surveyor conducts the survey of areas for their correct determination and description and for the establishment or reestablishment of land boundaries and the plotting of land and subdivisions thereof.

Systems Analyst - analyzes the needs and problems of computer users, proposes solutions to those needs and problems, develops general and detailed specifications of new or replacement system(s), installs and tests the resulting systems, develops detailed system and user documentation, and monitors/evaluates the performance of the systems.

Telecommunications - the science and technology of sending and receiving information at the desired quality and in the time frame required between selected points.

It begins with the use of the telephone instrument or other terminals and their proper use to select channels as required. It reaches into the scientific research required to invent new devices for amplification, memory, storage and logic devices. It is also concerned with the development of economical devices to meet users switching and transmission needs.

Transportation Planning - application of the principles of traffic engineering and traffic flow theory and simulation to the planning of movement systems; study of existing transportation systems and demand projection of needs, design and simulation of future systems in conjunction with plans for future land use, and programming the construction and administration of these future systems.

Urban Design - use of three-dimensional, physical design techniques from architecture and landscape architecture to create designs for large areas containing open and enclosed space as well as movement systems. Studies of existing and proposed environments in terms of their functional, social, and economic aspects, translation of community planning objectives into design program, and creation of designs for meeting the goals of these programs.

User Support/Help Desk Specialist - assists users who are having problems with existing computer systems, either in person or over the phone, and provides training to users in computer use; refers problems to appropriate technical experts as needed to resolve difficult problems; keeps records of requests for assistance and assistance provided; advises users of status of attempts to outstanding unresolved problems; learns how to use newly acquired and supported products.

Youth Program - organized programs aimed at youth that are typically run by youth bureaus (or subcontracted to other agencies), character building organizations (Boy Scouts, Girls' Clubs, CYO, YMCA, etc.), churches, community organizations and social service agencies (public or private) and similar organizations that are mainly concerned with delinquency prevention or control, personal and social growth and constructive use of leisure time. It does not include typical classroom teaching, but may include remedial programs. The Office of Children and Family Services (formerly Division for Youth) funds programs to serve persons from birth to 21 years of age.

Note: The age range of 7 – 21 is sometimes used to define the limits of "youth." This age relates to the ages within which the former Division for Youth (now the Office of Children and Family Services) can become involved with a person for rehabilitation purposes. The lower limit is from Section 712 of the Family Court Act and the upper limit is from Section 412 (Youth Commission Section) of the Executive Law.

If experience working with youth in a specific age group is required, that should be stated in the minimum qualifications. Absent such a statement, "youth" would encompass persons from birth to 21.

SME WORKSHEET
JOB KSA LINKAGE TO EDUCATION AND / OR EXPERIENCE FACTORS

LIST OF KSAPs DEEMED TO BE IMPORTANT TO <u>MINIMALLY</u> ACCEPTABLE JOB SUCCESS	CAN KSA BE LEARNED ON THE JOB (v)		CAN KSA BE LEARNED IN SCHOOL COLLEGE, VOC. ED., PROGRAM, ETC.? (v and list)				CAN KSA BE LEARNED/DEMONSTRATED VIA (PAST) WORK EXPERIENCE (v AND LIST)		
	NO	YES	NO	YES			NO	YES	
			Level	Length	Major	Occupational Class(es)	Length Required		

- If KSA can be **learned on the job it should not be considered** in establishing the minimum qualifications.
- If KSA can be learned by **Education**, list High School, College level of study as well as major concentration.
- If KSA can be learned by **Experience**, list the Job or Occupational Classification, Job Title as well as an indication as to how long it typically takes to acquire listed KSA.

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