

Proper staffing of an occupational safety and health office

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Due to the absence of research data on this matter, the tables giving weights to various degrees or categories of the elements were compiled empirically, based on the judgment and opinions of ten experienced safety professionals, by an extensive "trial and error" system. Widespread usage and the benefit of many more opinions based on experience, will undoubtedly result in further refinements.

Proper staffing of the office responsible for the company's occupational safety and health program is essential if the office is to perform its mission adequately. But strangely there are few if any practical guidelines as to what constitutes proper staffing of such an office. Because of the lack of a valid and workable definition of staffing requirements, the safety and health office is often one of the first to be cut when funds become tight or reductions in the work force are necessary. On the other hand, overstaffing is also undesirable.

This article presents a comprehensive guide for staffing an occupational safety and health office, taking into account the elements most relevant to requirements for professional personnel. The guide places appropriate weight on each of the principal elements; and by a simple calculation, specifies the ideal number of qualified technical safety and health personnel required to conduct a reasonably complete occupational safety and health program.

Applicability

This guide is applicable for evaluating the staffing needs of health and safety offices of organizations of all sizes and with all types of activities, from an organization with more than 100,000 employees, to a small organization that may require only a part-time safety and health officer. In the latter case the guide will indicate the actual

percent of time that the part-time safety and health officer should devote to the safety function.

This guide is not simply a device to justify *increase* in the size of a safety and health staff. It also demonstrates several ways that the required number of personnel in the office can be *reduced* if the organization will implement some basic principles of good management.

Scope and assumptions

The functions which are considered in the guide to constitute a reasonably complete program are listed in Table 1. "Adequate staffing" is the number of persons judged to be required to perform those functions.

The safety office shall be assumed to have a sufficiency of clerical or secretarial personnel to enable safety and health professionals to devote full time to technical safety and health activities.

No distinction is made between the various categories of safety and health personnel, whether they are safety engineers, safety managers, safety specialists, industrial hygienists, or have other titles. Persons in any of these categories are commonly called upon to perform any or all of the standard safety functions, and shall be assumed to be technically knowledgeable of safety programming basics and management principles.

Elements to be considered

The elements to be considered in establishing the required staffing of an office are:

- A. Number of employees in the organization.
- B. The average degree of hazard to which employees are exposed.
- C. The geographical dispersion of employees and facilities.
- D. The degree of responsibility the office has for safety and health of employees *at the operating level*.
- E. The degree of responsibility the office has for developing and establishing policy, procedures, and guidelines.
- F. The degree of responsibility for safety and health that is assigned to the organization's line supervisors and managers.
- G. Duplication Factor, if functions are performed by another office.

H. Additional considerations:

- (1) Additional duties assigned.
- (2) Exceptional safety and health situations.
- (3) Unusual circumstances.

The formula

The effects of each of the above-named elements on the staffing requirements for the safety office of a particular organization are numerically quantified, and by use of a simple computation the number of qualified safety and health personnel that should compose an ideally-sized staff is determined. Quantification FACTORS for elements A through G above are multiplied, and factors for H are then added to the result. The formula is as follows:

$$\left. \begin{array}{l} \text{Number of qualified} \\ \text{personnel required} \\ \text{on the} \\ \text{safety and} \\ \text{health staff} \end{array} \right\} = A \times B \times C \times D \times E \times F \times G + H$$

Quantification criteria

The FACTORS for each of the elements are quantified as shown below:

- A. *Number of employees:* This is the first consideration. Although identified here as "employees," the total should include the daily average of all other persons for whose safety and health the office is responsible, such as visitors, contractors, patients in hospitals, clients in offices, etc. The FACTORS for "Numbers of Employees" are given Table 2.
- B. *Degree of hazard:* The second element to be considered is the degree of hazard or risk to which the employees are subjected or exposed. The FACTOR is a measure of the *average* degree of risk for all the employees. This can be estimated by summations of employees in various job classifications or in the departments that perform work of various hazard degrees. The FACTOR for the average degree of hazard is determined by comparison with examples given in Table 3.
- C. *Degree of dispersion:* The next consideration is the geographical location of employees whose safety and health are to be protected. The principal distinction is whether or not the working locations are close enough for daily personal contacts and can be physically monitored by the office during a working day, i.e., overnight travel is not required. FACTORS are given in Table 4.
- D. *Degree of responsibility: at the operating level:* While there will usually be a staff or an office at each principal echelon of the organization, the proper size of the staff is directly related to the degree of responsibility the office has for the effectiveness of the safety program at the *operating level*. FACTORS are given in Table 5.

It can be noted from the descriptions and FACTORS in Table 5 how an organizational change would cause the category for this element to be changed from "total direct" to "indirect," with an accompanying reduction in the FACTOR and therefore a reduction in the number of persons needed on the staff. This could be done by instituting a functional assignment change in the organization, e.g., appointing and training a part-time or collateral duty safety and health officer in each integral group of employees who would be responsible

for monitoring safety at the operating level. This would change the category to "indirect" by adding an intervening staff echelon, causing the FACTOR to drop from 1.5 to 1.0, and resulting in a lower staffing requirement.

- E. *Degree of responsibility for developing and establishing policy, and procedures:* There is considerable variance in the degree of responsibility that safety and health offices have for this element. Some offices have total responsibility while others may act only as in intermediate relay point for transferring information. The proper FACTOR can be selected from Table 6, interpolating as appropriate.
- F. *Degree of assignment to the line organization:* The required staffing of an office or staff depends to a substantial extent on this element. FACTORS are given in Table 7. (Interpolate as appropriate.)
It can be noted here how the FACTOR, and therefore the required staffing of the office can be *reduced* by the functional change in the organization of assigning safety and health responsibilities to supervisors and managers. Obviously, such a change will also create a great improvement in the safety and health program.
- G. *Duplication factor:* In a complex organization of several echelons, it is only necessary that each safety function be performed fully and adequately by the safety office at one of the echelons. For example, if the safety office at the operating level is responsible to perform inspections, investigations, training, etc., the office at higher echelons does not require personnel to duplicate this performance. It may require only sufficient staff to monitor and spotcheck performance. Interpolate from Table 8 in accordance with the degree of assigned responsibilities to eliminate personnel requirement that would duplicate performance.
- H. *Additional considerations:*

- (1) *Adjustment for additional duties.* This adjustment is for time required of safety and health professionals to perform duties that may or may not be safety related, but ideally, should be performed by other organizations. Examples are: processing claims of employees; administration of the employee disability compensation program; disaster planning; environmental and pollution control; medical functions such as first aid training and non-occupational disease control; supply functions such as operating issue centers for safety shoes, hardhats and other safety materials; fire marshal duties; driver training and testing; security duties, etc. In each case the estimated number of managers required annually for such duties should be added to the required staff total.
- (2) *Exceptional safety and health situations.* Many organizations have unusually hazardous operations requiring additional staff personnel with special qualifications. Examples are: extensive chemical or biological laboratories; extensive use or processing of radioactive isotopes and use of lasers and x-rays; explosives handling or processing, etc. Special staffing needed for such operations will depend on the nature and magnitude of the operations and must be calculated on an individual case basis. Add the number of persons required for such duties to the staff.
- (3) *Unusual circumstances:* In any organization there may be diverse unusual situations which can

contribute to the required workload of the staff, such as exceptionally rapid turnover of employees, a rapidly growing organization, or unusually poor employee morale. Such situations could justify recommending additional staffing at least on a temporary basis.

Three examples are given in Illustrations 1, 2, and 3, of computations to determine proper staffing of health and safety offices for three different types of organizations.

Benefits

The use of this staffing guide will indicate whether an office is understaffed or overstaffed, based on a quantitative evaluation of the number of professionals required to adequately perform the assigned functions of the office. When the guide indicates that an office is understaffed it does not mean that the organization should immediately undertake recruitment of additional personnel. It means that the program should be given a careful review to determine which functions are not receiving adequate attention, and the actual and potential consequences. Management attention can then be focused directly on consideration of the adequacy of existing performance, the cost of improved performance by augmenting the staff as indicated by the guide, and the potential benefits to be derived. ☛

Table 1

Activities of a complete occupational safety and health program

Internal management: Organizing and supervising these functions:

- A. Development and promulgation of policies, standards, procedures
- B. Inspections and surveys of workplaces and operational areas
- C. Investigations of causes of accidents and occupational illnesses
- D. Training of safety and health personnel, and employees
- E. Safety and health education and promotion
- F. Safety and health engineering
- G. Review of hazardous operating procedures
- H. Job safety analyses
- I. Reporting of accidents, injuries, illnesses
- J. Summaries and analyses of causes and factors
- K. Safety and health committee development, promotion, operation

External management: Interfacing with these management groups:

- A. With all managers to promote management level controls of underlying causes
- B. With purchasing to assure safeguards in specifications and newly acquired items
- C. With personnel to assure safe placement and assignment
- D. With medical to assure physical capabilities and to detect potential health problems
- E. With training to assure employees' knowledge and skill to work safely
- F. With supply to assure adequate personal protective clothing and equipment
- G. With line managers to promote integration of safety and health considerations into all productive activities
- H. With middle and top management to assure safety and health consideration in all phases from conception, through planning, development, operations, disposal

Table 2

Factors for numbers of employees

Total Number of Employees	FACTOR	Total Number of Employees	FACTOR
0-25	0.1	1001-2000	2.0
26-50	0.2	2001-4000	3.0
51-100	0.4	4001-8000	4.0
101-200	0.6	8001-15,000	5.0
201-300	0.8	15,001-30,000	6.0
301-600	1.0	30,001-100,000	7.0
601-1,000	1.5	over 100,000	8.0

Table 3

Factors for degree of hazard

CATEGORY	Examples of hazardous activities	FACTOR
<u>Minimal</u>	Office activity, no power equipment except office machines, no moving machinery, good housekeeping and ample space with few fire or electrical hazards, excellent architecture and structures, good environment, few stairs, good ventilation. No known health hazards.	0.4
<u>Low</u>	Office atmosphere, light power equipment, somewhat crowded conditions, possible minor electrical, fire or structural problems, no known health hazards.	0.8
<u>Medium</u>	Standard wood and metal machine shops, paint shops, non-toxic chemical laboratories, light warehousing and storage, highway transportation, possible minor health problems.	1.2
<u>High</u>	Heavy construction work, excavation, use of hazardous machinery, gases under pressure, toxic chemical laboratories, fire fighting, some radiation hazards, known potential health hazards.	2.5
<u>Very high</u>	Use of highly toxic, sensitive or dangerous chemicals or biological agents; dangerous machinery; high pressure gases; hazardous transportation activity in air, water or on land.	3.5
<u>Critical</u>	Any activity where one mistake, oversight or moment of inattention is likely to cause a very severe disability or fatality. Examples are: deep sea diving, test flying, handling sensitive explosives or potent biological agents, bomb disposal or defusing.	4.5

Table 4 Factors for dispersion of employees	
Number of employees located where more than one day is required for visit and return	FACTOR
Less than 10% of total employees	1.0
From 10% to 20%	1.2
From 20% to 40%	1.4
From 40% to 60%	1.6
From 60% to 80%	1.8

Table 5 Factors for degree of responsibility for safety and health at the operating level		
CATEGORY	Description of responsibilities	FACTOR
<u>Total direct</u>		1.5
	The office has direct contact with first line supervisors, is fully responsible to monitor and supervise implementation of the program at the operating level.	
<u>Indirect</u>		1.0
	The office monitors but does not supervise implementation of the program at the operating level. Recommendations are reasonably mandatory. There is one intervening safety staff echelon which is responsible for the program at the operating level.	
<u>Partial</u>		0.6
	The office makes contacts at the operating level only in an advisory capacity and recommendations are advisory only. There is one or more intervening staff echelon.	
<u>Minimal</u>		0.1
	The office has no assigned responsibility for conduct of safety and health activities at the operating level.	

Table 6 Factors for degree of responsibility for policy and procedures		
CATEGORY	Description of degree of responsibility	FACTOR
<u>Complete</u>		1.5
	The office is fully responsible for developing and establishing safety policy and procedures.	
<u>Shared</u>		1.0
	The office shares actively with a higher echelon office the responsibility above.	
<u>Partial</u>		0.5
	The office receives guidelines, policies, and procedures from a higher echelon, adapts or adds detailed implementation instructions and guidance, promulgates same.	
<u>Minimal</u>		0.1
	The office has no part in developing and establishing policy, procedures.	

Table 7 Factors for degree of established assignment to the line organization of responsibility for safety and health		
CATEGORY	Description of line responsibility	FACTOR
<u>Full assignment</u>		0.5
	Managers at all levels are assigned responsibility for safety activities, and as an inherent part of their supervisory or management function, are responsible for the occupational safety and health of their subordinates. They are responsible to continuously inspect their areas of jurisdiction and take corrective action as needed; insure that employees have and properly use all necessary personal protective clothing and equipment; insure that equipment and machinery are properly guarded at all times; enforce all appropriate rules and established safe procedures.	
<u>Partial</u>		1.0
	The responsibilities described above are shared on an equal basis by line supervisors and the safety and health staff.	
<u>Minimal</u>		1.8
	The office is responsible for all safety and health activities including those described under "Full Assignment" above.	

... attention (is) focused directly on ... adequacy of existing performance, cost of improved performance, and potential benefits ...

Table 8 Factors to avoid staffing that would duplicate performance of functions		
If functions (from Table 1) are assigned to be performed by the OSH Office at another echelon:		
(1) Fully, and affecting all personnel, FACTOR is		0.1
(2) Fully for 50% of personnel, or only 50% of assigned functions for all personnel, FACTOR is		0.5
(3) Not at all, FACTOR is		1.0

<p>EXAMPLE NO. 1: The occupational safety and health office of a District Laboratory of the Food and Drug Administration.</p> <p>A. Number of Employees: 210. Referring to Table 2, FACTOR is: 0.8</p> <p>B. Degree of Hazard: (Referring to Table 3)</p> <p>Averaging the Degree of Hazard: 70 employees in LOW hazard environment x 0.8 = 56 100 employees in MEDIUM hazard environment x 1.5 = 150 40 employees in HIGH hazard environment x 2.5 = 100 306 306 210</p> <p>Average FACTOR for Degree of Hazard = 1.5</p> <p>C. Dispersion: (Referring to Table 4) There is no dispersion. All employees work in one city. FACTOR is: 1.0</p> <p>D. Degree of responsibility for overall safety and health at the operating level: (Referring to Table 5) Category is TOTAL DIRECT. FACTOR is: 1.5</p> <p>E. Degree of assigned responsibility for policy and procedures of total program: (Referring to Table 6) Responsibility is between MINIMAL and PARTIAL. Factor is: 0.5</p> <p>F. Established assignment of responsibility for employee safety and health to line organization: (Referring to Table 7) Category is FULL. FACTOR is: 0.5</p> <p>G. Duplication factor: None</p> <p>H. Additional considerations: None</p> <p>Computation for required staffing: $0.8 \times 1.5 \times 1.0 \times 1.5 \times 0.5 \times 0.5 = .450$</p> <p>Staffing required: Part time safety and health officer to perform safety duties 45% of time.</p> <p>Computations to determine the safety staff requirement for a small laboratory.</p>	<p>EXAMPLE NO. 2: Naval Ordnance Laboratory</p> <p>A. Number of Employees: 5,000. Referring to Table 2, FACTOR is: 4.0</p> <p>B. Degree of Hazard: (Referring to Table No. 3 and averaging by percents of employees)</p> <p>30% of employees in LOW hazard environment x 0.8 = 24.0 40% of employees in MEDIUM hazard environment x 1.5 = 60.0 30% of employees in HIGH hazard environment x 2.5 = 75.0 159.0</p> <p>Average Degree of Hazard = $\frac{159}{100}$ Factor is: 1.6</p> <p>C. Dispersion: (Referring to Table No. 4) Less than 10% of employees are dispersed beyond same day travel for visit and return. FACTOR is: 1.0</p> <p>D. Degree of responsibility for overall safety at the operating level: (Referring to Table No. 5) Safety office has total direct responsibility. FACTOR is: 1.5</p> <p>E. Degree of assigned responsibility for policy and procedures: (Referring to Table No. 6) Safety office participates, but many policies and procedures received from higher headquarters. Interpolate between SHARED and PARTIAL. FACTOR is: 1.1</p> <p>F. Assignment of responsibility for employee safety and health to line organization: (Refer to Table 7) Well established. Category is FULL. FACTOR is: 0.5</p> <p>G. Duplication Factor: None</p> <p>H. Other Considerations: Administers employee compensation: - 0.5 Process claims - 0.2 Operates safety store for shoes, safety glasses - 0.2 0.9</p> <p>Special Function: Health physics for 2,000 radioactive sources. 4 full-time health physicists required.</p> <p>Computation for required staffing: $(4.0 \times 1.6 \times 1.0 \times 1.5 \times 1.1 \times 0.5) + (0.9) + (4) = 15.1$</p> <p>Staffing required: 15 full-time professionals.</p> <p>Computations for determining the safety staff requirement for a large laboratory with hazardous environment.</p>	<p>EXAMPLE NO. 3: The occupational safety and health office of Headquarters, Food and Drug Administration.</p> <p>A. Total Number of Employees: 9,000. Referring to Table 2, FACTOR is: 5.0</p> <p>B. Degree of Hazard: (Referring to Table 3)</p> <p>50% of employees in offices (LOW hazard) x 0.8 = 40.0 40% in laboratories (MEDIUM hazard) x 1.5 = 60.0 10% in laboratories (HIGH hazard) x 2.5 = 25.0 125.0</p> <p>FACTOR is: 1.25</p> <p>C. DISPERSION: Referring to Table 4, 75% of employees located in laboratories dispersed nationwide requiring overnight travel from the headquarters. FACTOR is: 1.8</p> <p>D. Degree of responsibility for overall safety and health at the operating level: (Referring to Table 5) Assigned safety officer at each location is responsible for program. Category for Headquarters Office is INDIRECT. FACTOR is: 1.0</p> <p>E. Degree of assigned responsibility for policy and procedures: (Referring to Table 6). Headquarters OSH Office shares in developing, receives and adds details, promulgates to policies and procedures from higher Office, laboratories. Category is interpolated between PARTIAL and SHARED. FACTOR is: 0.8</p> <p>F. Established assignment of responsibility for employee safety and health to line organization: (Referring to Table 7) Responsibility is well established. Category is FULL. FACTOR is: 0.5</p> <p>G. Duplication Factor: 25 percent of functions are assigned and performed by other echelons for all employees. FACTOR is: 0.75</p> <p>H. Additional considerations: None</p> <p>Computation for required staffing: $5.0 \times 1.25 \times 1.8 \times 1.0 \times 0.8 \times 0.5 \times 0.75 = 3.40$</p> <p>Staffing Required: 3, preferably 4, safety and health professionals.</p> <p>Computations for determining the safety staff requirement for the headquarters of a complex organization.</p>
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