NIOSH

RESEARCH REPORT

Safety Program Practices in Record-Holding Plants

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Center for Disease Control
National Institute for Occupational Safety and Health

SAFETY PROGRAM PRACTICES IN RECORD-HOLDING PLANTS

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Public Health Service
National Institute for Occupational Safety and Health
Division of Safety Research
Morgantown, West Virginia

March 1979

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

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DHEW (NIOSH) Publication No. 79-136

ABSTRACT

This study is the third phase in a series of investigations examining safety program practices in industry. A survey of five companies was undertaken to obtain a more complete understanding of effective safety programming. The five plants were recognized industry leaders as of 1974 in man-hours worked without a disabling injury. Three were chemical plants, one was a textile plant, and one was a photoflash consumer products manufacturing plant. These five National Safety Council award winners were studied with a questionnaire used in a previous NIOSH study (Cohen, Smith, Cohen, 1975). Follow-up site visits to the companies were undertaken to verify in more detail the elements of successful safety programming.

This report summarizes the two studies which preceded this survey and compares the findings in this survey with those of the earlier studies.

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ACKNOWLEDGMENTS

The authors thank the following individuals for their assistance: Dr. Patrick Coleman and other staff of the Risk Management Section, Research, and Statistics Bureau, State of Wisconsin Department of Industry, Labor, and Human Relations, and Roger Jensen and Rebecca Simons of the Division of Safety Research, NIOSH, Morgantown, West Virginia.

INTRODUCTION

The following report describes the third and final phase in a series of studies examining distinctive features of successful safety program practices in industry. The first study (Cohen, Smith, Cohen; 1975) describes a mail-out questionnaire survey contrasting plants with good records versus similar ones with poor accident records. Forty-two matched pairs of plants representing six industries in the state of Wisconsin responded to the first survey. Each plant pair was matched in terms of industrial category (matched at least at the 3-digit level of Standard Industrial Classification), production workforce size, and geographic locale (urban or rural). The pairs differed, however, by at least 2-to-1 in injury incidence rates reported to OSHA in 1972 and 1973. The questionnaire dealt with aspects of:

1) Management commitment to safety
2) Job safety training
3) Safety incentives and promotion techniques
4) Hazard control measures
5) Accident investigation and reporting procedures
6) Workforce characteristics

The results of this first phase questionnaire survey showed low accident companies as having more of the following characteristics:

1) Greater stature and staff commitment given to direction of company safety efforts;
2) Greater utilization of outside (e.g., community) influences in instilling safety consciousness in workers;
3) More concerted use of a variety of safety promotional and incentive techniques;
4) Greater opportunities for general and specialized job safety training with supplemental modes of instruction for all production personnel, e.g., group discussions, lectures by safety specialists;
5) More humanistic approach in disciplining risk-takers and violators of safety rules;
6) More frequent, though less formal, inspections of the workplace as a supplement to or instead of formal inspections at lengthly intervals:
7) A safety program emphasizing better balance between engineering and non-engineering approaches toward accident prevention and control;
8) More stable qualities in the make-up of the workforce, i.e., more older, married workers with longer time on the job.

The second study (Smith, Cohen, Cohen, Cleveland; 1978) describes the results of site visit surveys of a sub-sample of 7 of the 42 matched pairs of plants included in the initial questionnaire survey. The purpose of the site survey was to verify and extend the findings of the questionnaire study. Information was obtained through interviews

with plant management and some production employees. In addition, plant walk-arounds were conducted for the purpose of observing plant operations and safety practices in action.

The results of the second phase site surveys complemented the questionnaire findings. The data indicated that the low accident companies in comparison to the high accident rate companies showed:

1) Greater management commitment and involvement in the safety program and plant safety matters;
2) A more humanistic approach in dealing with employees, stressing frequent positive contact and interaction;
3) Better employee selection procedures;
4) More frequent use of lead workers instead of supervisors to train employees:
5) Much better housekeeping and general plant cleanliness;
6) Better plant environmental qualities, e.g., less noise and heat, better ventilation and lighting;
7) Greater availability and usage of personal protective equipment when required;
8) Lower turnover and absenteeism among a more stable workforce.

Although several factors emerged which could. in part, explain differential safety performance between matched pairs of high and low accident rate plants, a more definitive picture of "exemplary" safety programming was desired. Many factors in the previous two studies suggested differences. It was felt that by surveying companies recognized as industry leaders in safety. a clearer and more complete understanding of safety program effectiveness could be obtained. Consequently, a third and final study, which is the subject of this report, was conducted in order to verify and extend the findings of the two previous studies.

METHODOLOGY

Eight plants were selected from an annual National Safety Council publication entitled Work Injury Rates (1975) which provides the names of National Safety Council member companies having the most outstanding safety performance records in the country. The eight plants to be solicited for participation in this study had, at the time of the publication, the most enduring no-lost-time injury rates in the nation. Each of the eight plants was mailed a copy of the "Occupational Safety Program Questionnaire" used in the first study (Cohen, Smith, Cohen; 1975) along with a cover letter explaining the purpose of the study. The survey methods were essentially the same as those reported in the previous two studies. The mail-out questionnaire consisted mainly of multiple-choice, yes-no questions soliciting information in six areas previously reported (Cohen, Smith, Cohen; 1975). The letter, which was addressed to the plant safety officer, asked for voluntary cooperation in filling out and returning the questionnaire. Follow-up letters and phone calls were used to obtain a total of five willing participants out of the original eight plants solicited. The five plants participating in the questionnaire had one important common factor. All were recognized industry leaders as of 1974 in man-hours worked without a disabling injury. The five plants, however, differed widely in type of industrial processes and products manufactured. All of the five plants which returned the completed questionnaire indicated their willingness for follow-up site visit interviews and plant walk-arounds as performed in the previously mentioned second study (Smith, Cohen, Cohen, Cleveland; 1978).

Table 1 presents the Standard Industrial Classifications represented by the five participating plants as well as the products, the reported workforce sizes, and cumulative man-hours of work without lost-time injuries. As can be seen from the table, each of the five plants demonstrated superlative no-lost-time injury records. Three of the participating plants were chemical plants, one was a textile plant, and one was a photoflash consumer products manufacturing plant.

When follow-up site visits were conducted, they typically took 2 or 3 days to complete. Approximately two-thirds of the time was spent interviewing plant personnel; the remaining one-third was devoted to the walk-around. Interviews were held with both plant management and worker representatives. The interviews and plant walk-around were conducted by a similar multi-disciplinary site survey team as in the Smith, Cohen, Cohen, Cleveland (1978) study. The team consisted of two or three safety professionals having expertise and training in industrial psychology, human factors engineering, accident investigations and recordkeeping, OSHA standards, safety training needs and requirements, and hazard analysis procedures.

TABLE 1

GENERAL PRODUCTION AND DEMOGRAPHIC CHARACTERISTICS OF NO LOST WORKDAY INJURY PLANTS

Company	Standard Industrial Classification (SIC)	Products	Reported Average Employment	Total Number of Hours Worked Without A Lost Workday Injury[1]
A	2823	Man-made Cellulose Fibers (Dacron)	2,300	49,291,249[2] Hours
B	2392	Sheets and Pillowcases	525	7,501,176
C	3641	Photoflash & Photoflood Bulbs	1,400	15,673,806
D	3295	Silicone Crystals (used in illuminated electrical displays & microcircuits)	580	14,408,506
E	2819	Research Development & Production of Nuclear Components	900	30,117,282

[1]As of 1975.

[2]World Record Holder in 1975 for longest period without a lost workday injury.

Aspects of each plant's safety program and related activities were rated on a subjective seven-point rating scale shown in Figure 1. The scale values ranged from a score of 1 (very poor) to 7 (excellent). Figure 2 shows the program areas which were rated. Ratings for each program area were obtained from a composite of individual ratings provided by members of the site survey team. Specific dimensions of safety programs designed to evaluate plant safety performance in each of the program areas were rated and combined into a program area score. Average ratings of the five plants for each program area were obtained and are presented in the Results section.

Figure 1. Rating Scale Used
To Evaluate Matched Plants for Subject Areas

Rating	Interpretation
1	very poor
2	poor
3	fair
4	moderate
5	good
6	very good
7	excellent

Figure 2: Program Areas Rated

Program Areas

(1) Corporate organization and management structure
(2) Management commitment to safety
(3) Management efficiency
(4) Plant solvency
(5) Plant physical characteristics
(6) Workforce characteristics
(7) Union characteristics
(8) Industrial and human relations program
(9) Pay scheme and reward systems
(10) Safety program characteristics

a. staff
b. organization
c. safety committee(s)
d. safety meetings
e. safety training
f. inspections and audits
g. policy and work rules
h. accident investigations
i. recordkeeping
j. medical and first-aid services
k. contests and promotions
l. machinery hazard control
m. personal protective equipment
n. environmental control
o. special techniques

1. critical incidence
2. behavior observation
3. hazard surveys
4. safety sampling
5. other

RESULTS

A. MAIL-OUT QUESTIONNAIRE

The data from the mail-out questionnaires are presented in the Appendix. The results presented are purely descriptive since no statistical evaluations were possible because of the small sample size. Rather, the results are discussed qualitatively as either a corroboration or extension of the findings of the two previous studies. For the purposes of this evaluation, results were considered worthy of discussion if a majority--3 out of 5 plants--responded alike.

(1) Management Practices: Questions 1-11, 16-21. 31-34, as presented in the Appendix showed information about certain management policies and practices deemed expressive of company commitment to safety.

All five plants reported having written safety policies and work rules. In all cases, safety matters were regularly included on the agenda of plant management meetings, typically the first item on the agenda. Three plants considered plant management, rather than the employee himself, to be primarily responsible for safety of employees. Three plants reported that less than 1% of their total operational budgets was specifically ear-marked for safety. Table 2 presents the number of full-time and part-time safety personnel as well as the percentage of time that part-time safety personnel devoted to safety duties in that plant. Three of the five plants had full-time safety directors, while two of the plants incorporated the functions of safety director with those of personnel manager. In four cases, line supervisors were considered to be part-time safety staff with a significant percentage of their time devoted to safety matters. Four of the five plant safety directors were reported holding middle or top level management positions. Two of the plant safety directors had college course-work related to safety to supplement experience gained by coming up through the ranks. The remaining three had no college training in safety but considerable safety experience gained by coming up through the ranks. All five plants required some form of safety director approval for facility changes. Four of the plants believed that their safety programs had a beneficial effect on reducing operations costs.

Responses to some of the questions dealing with specific aspects of safety programs suggested strong management commitment and support for safety. For example, three had occupational alcoholic programs, and each believed such programs to be beneficial. All plants felt that the worker's family and/or outside community could have a beneficial effect on worker safety performance. Thus, three plants had initiated or aided in developing family or community efforts to improve worker safety awareness. Four of the five had formal programs to involve workers as well as supervisors in the development of safety programs and practices.

(2) Motivational Techniques: Questions 12-15 and 43-47 were intended to reveal the nature of techniques, both positive and negative, which were aimed at promoting safety worker behavior. A variety of incentives were reported to be used to promote worker safety. All five plants preferred incentives which provided safe behavior feedback to the workers

TABLE 2

NATIONAL SAFETY COUNCIL
AWARD WINNER SAFETY STAFFING

Plant	Industry	Number of Employees	Number of Full-time Safety Personnel	Number of Part-time Safety Personnel	Percent of Time Spent On Safety by Part-time Personnel
A	Manufacture of Synthetic Fibers	2300	3 (all Supervisors)	895	5-10%
B	Manufacture of Sheets and Pillowcases	525	.5	28	No response
C	Manufacture of Photoflash bulbs	1400	0	2	15%
D	Manufacture of Silicone crystals	580	1	0	0%
E	Nuclear Research and Development	900	5	2	40%
Total		5705	9.5	927	

rather than recognition or cash awards. Three of the five plants considered "safety attitude and behavior included in worker performance evaluations" as the most effective incentive. Other factors, listed in order of effectiveness, were "a running tally of accident-free man-hours," publicity of outstanding safety performance," and "recognition awards." A wide variety of information materials was used in promoting job safety. Information sources, such as posters, signs, displays, and exhibits, were considered by 3 of 5 plants to be the most effective means of advertising job safety. Department and plant safety contests used by 3 plants, and preferred by one, were considered to be less effective than posters, signs, displays, and exhibits in promoting safety. Disciplinary systems in all five plants were fairly traditional. First offenders would receive a verbal reprimand. Repeaters could receive written reprimands, or disciplinary time-off. Four plants used dismissal as the ultimate disciplinary action.

(3) Training Practices: Questions 2 and 22-30 were concerned with various aspects of available safety training. Four of the plants reported having a formal safety training program, i.e., written procedures describing how the safety training is to be carried out. In four of the five plants, supervisors received training in overseeing the safety of their work groups. Workers received safety training from a variety of plant personnel, e.g., supervisor, safety staff, plant management, depending upon the particular need of the job which was being performed.

A variety of safety training techniques was employed. Most common, in four of the five plants, was instruction by supervisors, group discussions, movies and instruction by safety personnel. In four plants, safety training was given to all new employees. Four of the plants had follow-up safety training generally tailored for specific jobs. Information from the National Safety Council was considered to be particularly useful for safety training purposes. Other sources of particularly useful information were professional associations and Federal government agencies.

(4) Hazard Control Measures: Questions 31-38, 40-42, and 45 were concerned with aspects of hazard control involving engineering, personal protection, and safety inspection considerations. In all five plants, design plans for new work facilities and proposed renovations of existing installations were subject to approval of plant safety personnel. Safety personnel in three plants had to approve new or modified work processes before they could be put into operation. In all plants, safety features were included in the specifications for new equipment purchases. Safety personnel in four plants approved newly installed equipment before it could be used.

Safety personnel in all plants conducted inspections to insure that safe work conditions and practices were being followed. Three of the plants were inspected frequently, either daily or weekly, with written checklists typically being used. Top plant management, safety personnel, supervisors, and workers were all involved in plant safety inspections in four of the five plants.

Personal protective equipment was widely utilized in all of the five plants. Such protective equipment included: boots, hard hats, gloves, face protectors, creams, ear protectors, aprons, respirators, and protective suits. Both eye protection and safety shoes were required of all workers through the entire plant in at least four plants. Costs for most protective equipment, including safety glasses and safety shoes, were borne by the companies.

(5) Accident Investigation and Reporting: Questions 48-62 dealt with accident investigation and reporting procedures. All plants indicated having a system established for workers to report suspected potential accident hazards. In four of the five plants, workers reported hazards verbally to their supervisors. Accident reporting forms unique to the plant or company were used by all five plants to supplement those required by OSHA. In addition to lost-time injury, data information on non-lost-time injuries and near-accidents were kept in four of the plants. Lost-time injuries were always investigated, usually within 24 hours of occurrence. In four plants, near-accidents and minor injuries were investigated within 1 to 3 days. In four plants, a variety of plant personnel in addition to safety staff were involved in investigating accidents. Typically the additional personnel included plant management, medical personnel, worker representative(s),involved employee(s), and supervisor(s) of involved employee(s). Three of the plants publicized the results of accident investigations as a form of safety information feedback. The investigation results were made available to top management in all plants and to production workers in three plants. Plant accident statistics were used for determining safety program effectiveness and planning changes in safety program practices in all plants. Accident experience data of similar plants was always obtained and was typically used in four plants as an indicator of plant safety program effectiveness.

(6) Workforce Characteristics: Questions 63-68 gathered information about the production workforce. The median number of production workers employed by the five participating plants was 900. Number of production workers employed ranged from 525-2300 at the time of the survey. The average length of plant service was reported to range from 7-12 years. Three plants estimated the average age of production workers to be about 28 to 32 years old. Two companies reported ages of 33-37 years and 38-42 years respectively. Three plants reported 80% or more of their workforce were married. Production workers were typically described as high school or vocational school graduates. The span of supervisory responsibility in the five plants was highly variable ranging from 6 employees to 41 or more.

B. SITE VISITS

(1) General Production Characteristics: The first plant visited was engaged in the manufacturing of synthetic (dacron) fiber for both industrial uses (e.g. tires, rope) and textile products (e.g. shirts, trousers,lingerie). The second plant visited was a textile finishing operation which received unprinted bolts of permanent press cloth (50% cotton/50% synthetic) from another plant within the corporation, printed patterns on the cloth, and cut, sewed, folded, and packaged it as sheets and pillowcases. The facility involved a large warehousing operation. The third plant was engaged primarily in light assembly manufacturing of photoflash and photolamp bulbs. Its products were flashcubes, "flip flash" bars, and assorted tungsten projector or professional photographic lighting bulbs. The fourth plant visited was engaged in manufacturing silicone crystals for electrical micro circuits. The process involved the drawing or "growing" of various types of crystals at temperatures of 1400°F or greater in vacuum furnaces. The crystals were then inspected, x-rayed, machined into cylinders, oriented for slicing, sliced into wafers, either etched or polished, inspected and packed for shipment. The fifth plant was a research, development, and production facility for nuclear detonators, explosive timers, explosive actuated transducers, fire sets, pellets, and nuclear components for nuclear weapons, for plutonium-238 heat sources for space and medical applications, and for the separation and purification of stable and rare radioisotopes. Although some of the processes observed were apparently quite unique, particulary in the latter two plants, many common industrial operations were principally involved, e.g., assembly, inspection, machining, and materials handling.

(2) Demographic Characteristics of the Plants: Despite differences in industrial production processes, certain features common among the five plants visited were noted. All five plants were operated by large, publicly-owned corporations. All had physical facilities with large production workforces (range: 525-2300 production workers; median: 900 production workers). Three of the five plants were in the chemical industry. Four of the plants were primarily capital intensive, utilizing a great deal of highly technical and automated equipment. None of the five had operations involving any heavy materials handling. Four had operations where the employees rarely handled the materials without some tool or automated device. Four of the five were principally involved in the manufacturing of materials or products for consumer markets. All five plants were located in small towns - rural rather than in metropolitan areas. Finally, there appeared to be a strong sense of community, belonging, and loyalty to the company among the employees.

(3) Program Factor Ratings: Tables 3-7 compare the ratings of safety program factors for the five participating plants to ratings given to matched pairs of low-and high-accident-rate plants surveyed in a previous study (Smith, Cohen, Cohen, Cleveland; 1978). As might be expected, the five plants exhibited superior qualities in all facets of their safety program in comparison to the plants from the other study.

TABLE 3

RATINGS OF COMPANY COMMITMENT TO SAFETY IN NATIONAL SAFETY COUNCIL AWARD WINNERS, LOW-INCIDENCE-RATE COMPANIES AND HIGH-INCIDENCE-RATE COMPANIES IN WISCONSIN [1]

Factors	Rating [2] National Safety Council Award Winners	Low Incidence Rate Companies	High Incidence Rate Companies
Management Commitment Rating	6.4	5.0	4.0
Manager Involvement Rating	6.2	4.0	3.1
Financial Resources Commitment Rating	6.4	4.6	4.1
Use of Safety Policies Rating	6.6	4.1	3.7
Use of Safety Rules Rating	6.2	4.0	3.6

1/ Low-Incidence-Rate and High-Incidence-Rate Companies' Ratings are taken from Smith, M. J., Cohen, H. H., Cohen, A., and Cleveland, R. J., "Characteristics of Successful Safety Programs," Journal of Safety Research, Spring, 1978.

2/ On a 1 to 7 Scale

TABLE 4

RATINGS OF UNION RELATIONS
IN NATIONAL SAFETY COUNCIL AWARD
WINNERS, LOW-INCIDENCE-RATE COMPANIES
AND HIGH-INCIDENCE-RATE COMPANIES IN WISCONSIN [1]

Factors	Rating [2/] National Safety Council Award Winners	Low-Incidence-Rate Companies	High-Incidence-Rate Companies
Average Union/Plant Relations Rating	6.5	5.3	4.0
Number of Matched Plants with Better Rating than Partner	*	3	0

* Not Applicable

1/ Smith, Op. Cit.

2/ On 1 to 7 scale.

TABLE 5

RATINGS OF WORK FORCE STABILITY CHARACTERISTICS IN NATIONAL SAFETY COUNCIL AWARD WINNERS, LOW-INCIDENCE-RATE COMPANIES AND HIGH-INCIDENCE-RATE COMPANIES IN WISCONSIN [1]

Factors	Rating [2] National Safety Council Award Winners	Low-Incidence-Rate Plants	High-Incidence-Rate Plants
Turnover Rating	5.2	4.0	3.0
Absence Rating	6.0	3.7	2.4
Work Group Stability Rating	6.8	5.6	4.5

1/ Smith, Op. Cit.

2/ On 1 to 7 scale.

TABLE 6

RATINGS OF PLANT PHYSICAL CHARACTERISTICS IN NATIONAL SAFETY COUNCIL AWARD WINNERS, LOW-INCIDENCE-RATE COMPANIES AND HIGH-INCIDENCE-RATE COMPANIES IN WISCONSIN [1]

Factors	Rating [2] National Safety Council Award Winners	Low-Incidence-Rate Plants	High-Incidence-Rate Plants
Environmental Quality Rating	6.6	3.7	2.6
Housekeeping and Cleanliness Rating	6.4	5.3	4.0
Plant Layout Rating	6.6	4.9	4.0

1/ Smith, Op. Cit.

2/ On 1 to 7 scale.

TABLE 7

AVERAGE RATINGS FOR
NATIONAL SAFETY COUNCIL AWARD WINNERS
LOW-INCIDENCE-RATE COMPANIES
AND HIGH-INCIDENCE-RATE COMPANIES IN WISCONSIN [1]

Rating [2]/

Program Area	National Safety Council Award Winners	Low-Incidence-Rate Companies	High-Incidence-Rate Companies
1. Corporate Organization and Management Structure			
a. Family(f) or Closely Held(c) or Stocks(s)	5s	4f/1c/2s	5f/1c/1s
b. Management Complexity	4.6	4.0	3.7
2. Management Commitment to Safety			
a. Involvement	6.2	4.0	3.1
b. Financial	6.0	4.6	4.1
3. Management Efficiency	6.2	4.6	3.7
4. Solvency	6.4	5.0	4.0
5. Plant Physical Characteristics			
a. Conditions of Physical plant	6.6	5.0	4.7
b. Cleanliness	6.4	5.3	4.0
c. Layout	6.6	4.9	4.0
d. Environmental Qualities	6.6	3.7	2.6
6. Work Force Characteristics			
a. Turnover	5.2	4.0	3.0
b. Absence	6.0	3.7	2.4
c. Stability of Work-force Core	6.2	5.6	4.5

1/ Smith, Op. Cit.

2/ On 1 to 7 scale.

TABLE 7 (Continued)

Program Area	National Safety Council Award Winners	Low-Incidence-Rate Companies	High-Incidence-Rate Companies
7. Union Characteristics			
a. Number Unionized/ Not Unionized	1/4	4/3	6/1
b. Management/Union Relations	6.0	5.3	4.0
8. Industrial and Human Relations/Programs			
a. Attitude of Management toward employees	6.8	4.7	4.1
b. Attitude of Management toward young employees	5.6	3.4	3.3
c. Number and extent of H.R./I.R. programs	5.6	5.0	3.7
d. Nature of plant operation/ quality of jobs	6.4	3.7	3.1
e. Promotion and advancement opportunity	4.0	4.0	3.6
f. Hiring and promotion procedures	5.6	4.6	3.7
g. Employee/supervisor interaction	6.0	4.0	2.7
h. Extracurricular employee activities	6.4	4.1	3.6
9. Pay Schemes and Reward/ Punishment Systems			
a. Incentive/hourly rate of pay	all hourly	3/4	4/3
b. Level of pay	5.8	4.7	4.3
c. Levels of discipline	5.0	4.0	4.6
d. Use of discipline	5.0	4.3	3.7
10. Safety Program Characteristics			
a. Staff	5.2	3.0	4.0
b. Organization	6.2	---	---

--- Not rated in previous study

TABLE 7 (Continued)

Program Area	National Safety Council Award Winners	Low-Incidence-Rate Companies	High-Incidence-Rate Companies
c. Safety Committees	5.6	2.6	4.0
d. Safety Meetings	5.8	1.7	2.0
e. Safety Training employees and supervisors	6.3	3.1	2.7
f. Inspections	6.0	3.6	3.1
g. Policy and Work Rules	6.4	4.1	3.7
h. Accident Investigation seriously/all	0/5	5/2	6/1
i. Recordkeeping	6.0	3.6	3.4
j. Medical and first aid	6.0	---	---
k. Use of contests and promotions yes/no	0/5	1/6	1/6
l. Machinery and hazard control	6.6	4.9	4.0
m. Personal protective equipment	6.0	5.0	4.0
n. Environmental control	6.6	3.7	2.6
o. Special techniques yes/no	5/0	3/4	2/5
p. Overall impression of safety program	6.0	5.0	3.7

--- Not rated in previous study

(a) Management Commitment to Safety: Without exception, the five plants demonstrated a strong management commitment to safety. Their composite ratings averaged very good to excellent on this factor. Financial expenditures for safety were high in four of the five plants, ranging from less than 1% up to 3% of the plant's operating costs. Plant management frequently expressed the view that worker safety took precedence over all other matters, including production. All plants had a written corporate safety policy which was not only stated but implemented as well throughout all levels of the organization. All of the plants had written general safety rules, which were usually given to each employee upon hiring and which were displayed on bulletin boards. Through some type of hazard analysis program such as job hazard analysis or critical incident technique, three plants had developed specific safety work rules for particular jobs. Managers were highly involved in the development and execution of plant safety programs in four plants.

(b) Management Efficiency and Plant Solvency: All five plants showed evidence of high profitability based on current sales levels and number of back orders estimated by plant management. As an example, one company had a net income of 18.1% of its net sales. Safety was generally regarded as good business and plant safety performance was used as a criterion of management and supervisory efficiency. All levels of plant management were held accountable for their respective groups' safety as well as production performance. All plants were self-insured for Workers' Compensation and thus benefited directly from their own safety performances.

(c) Industrial and Human Relations: All plants had extensive and comprehensive employee relations programs, e.g., personnel functions, counseling programs, affirmative action and training programs. Three of the five plants had sophisticated means of new employee selection and employee upgrading and advancement programs. Interaction between management and workers was, in three of the plants, open and informal. Four of the plants used a straight hourly pay system. Only one plant paid some workers piecework incentive. Pay scales were generally quite high in relation to others in the surrounding community, and fringe benefits were typically quite good. There was little union activity. Four plants had no unions while the fifth had only partial, nominal unionization. Apparently, attempts at unionization had failed because employees presently seemed to be content with the way the company treated them.

(d) Workforce Characteristics: Turnover was negligible and absenteeism rates were quite low. Work group stability ratings were excellent. No plant had a very high turnover, and three plants had no turnover in a year. All five plants had very low absence rates (2 to 4% per week).

(e) Plant Physical Characteristics: Plant walk-throughs, as a rule, revealed very good to excellent housekeeping practices, clean work areas and aisles. All five plants were built between the mid 1940's

and the late 1960's. Environmental qualities were typically very good to excellent. Most work areas were well lighted and well ventilated; noise and dust were kept to a minimum. Layout of the plant, condition of the equipment, and work procedures were all rated high. Only one plant showed any signs of crowding. Four plants had good aisle space and adequate space between machines and operations. Four plants had very sophisticated, highly specialized production equipment. Four designed and built much of their own production equipment. All five plants appeared to have very good preventive maintenance programs.

(4) Safety Program Characteristics:

(a) Safety Staff: Three of the plants had at least one full-time safety professional, while two of the plants had part-time safety staff. In four plants, line supervisors were considered to be part-time safety staff with at least 5% of their time devoted to safety matters. In all cases, safety was administered as a personnel/industrial relations function, rather than production/engineering function. Safety directors either had personnel as well as safety responsibilities or reported to personnel managers in the larger plants. All safety directors were typically mid- or top-level managers at the plant level. The two plants in the chemical industry had industrial hygiene support staff. All had staff trained in first-aid and fire protection. One of the large plants in the chemical industry had its own central fire department complete with the latest fire-fighting equipment, trucks, and a 13-man crew on 24-hour alert, reporting to the safety director.

All but one of the plants had full-time nurses on staff. Three plants had either full-time or part-time physicians on-site. First-aid facilities were extensive in three plants, offering a wide variety of in-plant medical care from first-aid to x-rays.

(b) Safety Committee: Safety committees were vital functioning parts of the safety program in all plants. Some of the larger plants had several safety committees operating within different levels in the organization, such as department and plant. In four cases, employees and management worked cooperatively in the planning and execution of safety activities. The function of each committee was slightly different. However, they all involved some combination of the following elements: 1) hazard review; 2) injury review; 3) physical inspection; 4) training and education; and 5) hazard correction suggestions. They ranged in responsibility and authority from being able to issue correction orders to being purely advisory to line plant management.

(c) Safety Training: In all plants, first line supervisors, rather than lead workers, were responsible for safety training. Most worker training was on-the-job. Some formal classroom training by training specialists was offered for certain jobs in four plants, e.g. sewing machine operators, machine tenders or fork-lift truck operators. In most cases, new worker training involved understanding safety work

rules developed from job hazard analyses. Refresher safety training was available on a continuing basis.

(d) Inspections and Hazard Identification: Inspections took a variety of forms. Two plants had daily, informal inspections of work areas by area supervisors. Line management was responsible for routine production, housekeeping, and hazard management. In addition, periodic, formal inspections utilizing checklists and inspection guides were made by safety staff, management, and worker representative teams in all plants. Such detailed area inspections were typically scheduled monthly or quarterly. Sometimes, management and workers from different areas performed the formal inspections in order to obtain a fresh and objective viewpoint. In four plants, management and workers were cooperatively involved in plant inspection and hazard identification programs. In all cases, hazard identification was quickly followed up by hazard correction and reinspection. Line management was typically responsible for hazard correction within a period of time designated by the inspection teams. In some of the plants, a third level of safety inspection was performed on an annual basis. Such plant-wide safety audits examined all facets of the organization's safety program. Everything from management goal-setting to adequacy of specific job safety procedures was evaluated. Consultative support was typically available from corporate headquarters for all five plants.

Most of the plants had some sort of job hazard analysis program. The purpose of these programs was to determine individual job hazards and develop suitable control measures. Emerging from these analyses were specific safe job procedures which serve as a basis for job safety training. In three plants, both workers and line management participated in the development, periodic updating, and execution of the job hazard analysis programs.

(e) Accident Investigations: Since all of the five plants had worked several years without a disabling injury, there were no recent lost-time accidents to be investigated. However, all plants investigated most mishaps requiring unusual medical attention and known near-miss accidents whether there was property damage or not. Investigations were typically performed by worker/management teams. Safety staff were always involved, and other plant specialists were called in as needed. An investigation was made shortly after the incident occurred, within 24 hours, if possible.

(f) Personal Protective Equipment: Extensive use of personal protective equipment was prevalent in all plants visited. In addition to mandatory eye and foot protection, a variety of devices from aprons to respirators was required and used in specific areas of the plants. Workers were especially well protected when working around potential chemical hazards. Elaborate protective measures were taken in one plant in which radioactive materials were used. Employee acceptance and use of personal protective equipment was unusually good. It appeared that when

management decided that equipment was necessary, and it was supplied; employees were educated, and convinced that it was necessary. Its use was mandatory and rigidly enforced. On several occasions, members of the NIOSH research team were provided with proper protective equipment which met the plant requirements. On one occasion, the team was outfitted literally from head to foot with personal protective equipment, including the fitting of respirators in testing chambers to check for fit and leakage.

(g) Safety Incentives: The majority of plants preferred use of the informational materials for maintaining worker safety awareness. Recognition awards were used more frequently at the management and corporate levels, e.g., a plaque or publicity of outstanding plant records in a corporate newsletter. Safety behavior feedback to workers—performance ratings, area tallies of acident-free man-hours, posting recommendations for future prevention of incidents on bulletin boards—, was generally regarded as the most effective incentive. In all plants, a system of immediate feedback on employee performance was used by supervisors as much as possible. When an employee did a good job, he was immediately recognized for his work by his supervisors. Those who did good work were rewarded. If the employee did a poor job or violated safety rules, he was immediately corrected by his supervisor. One company had an extensive formal training program for supervisors which was designed to develop the supervisor's ability to immediately communicate either good or poor performance to an employee.

DISCUSSION

Two previous related studies (Cohen et al., 1975, and Smith et al., 1978) looked at safety program effectiveness through a mail-out questionnaire and site-visit survey of matched pairs of high-and low-accident rate-plants in one state. Some differences emerged, and appeared to account, in part, for the differential safety performance of low-and high-accident-rate plants. The present study similarly surveyed five plants selected as industry leaders in number of man-hours worked without a disabling injury (using ANSI Z16.1 definitions) in order to characterize more definitively the factors distinguishing successful safety program practices. In general, the findings corroborated those of the previous studies. However, the companies with exemplary safety performance typically did more things better than the companies comprising the previous two studies. In this study, certain program features emerged as being strongly associated with superior plant safety performance. These are discussed below.

A. Management Commitment to Safety

Management ordinarily has a written statement of commitment to occupational safety within their plants. All of the five National Safety Council no-lost-workday plants likewise had written corporate and plant safety policies. The difference between success and failure in occupational safety, however, appears to be real commitment, i.e., active management involvement, rather than mere lip service. The evidence to support this conclusion is found by reviewing a range of findings from this survey.

In four plants, the plant safety director had direct contact with the plant manager on a daily basis. All five plants required that safety personnel always approve changes in the design of work facilities before the changes were made. All plants required that new equipment purchases include safety specifications. Four of the five required safety approval of any changes in production procedures before the changes were put into operation. Resources for safety, both money and people, were typically abundant. Special emphasis programs were likewise prevalent, e.g., plant-wide safety audits, job hazard analyses, medical examinations and tests, employee counseling, and community action to promote safety off the job. In four of the five plants, the plant and line managers held some of the direct responsibility for safety. In none of the plants was a safety decision made without the involvement of plant or line management. Finally, the extent to which two of the corporations evaluate their manager's safety performance, i.e., safety accountability, can be seen in the statements of two plant managers. One manager related how he came to his present status as a plant manger when a predecessor had been fired because of the plant's poor safety performance, even though the production performance of the plant had been better than average. Another told about yearly corporate safety meetings in which the Chairman of the Board gave recognition and monetary awards for good safety performance and public "dressings down" for bad performance. He stated that "I am glad that I have always had a good safety record, because I've seen what happens to people with poor records."

B. Management Efficiency with Respect to Safety

Managment efficiency is a concept which is given many different meanings in many different contexts. For this discussion, efficiency is defined as anticipation of potential safety problems, adequate pre-planning to overcome these problems and evaluation of effectiveness of management and employee efforts in following the plan devised to overcome these problems. In managing occupational safety and health, this means the development of some form of hazard identification program, implementation of hazard prevention through engineering control, preventive maintenance, safety training, a protective equipment program, and utilization of evaluation programs for judging management and employee effectiveness in hazard control.

All five National Safety Council award winning plants encouraged some form of employee hazard identification. Regardless of what the technique was called-- Job Safety Analysis, Critical Incident Reporting, Hazard Survey, etc.-- the employees of all five plants had some system for communicating hazard information to management. The methods used for hazard communication in each plant were quite different: some plants required written notifica-- tion while others required only verbal notification; some plants had hazards reported to line supervisors, while others had hazards reported directly to safety personnel. Despite these procedural differences, all plants encouraged employees to report hazards to management.

The results of this site-visit survey confirm the findings of the previous site-visit survey which showed that the plants which were superior in safety performance were also typically cleaner, more efficiently designed and had generally better plant environmental qualities (control over noise, heat, dust, fumes, lighting). Work areas and aisles were typically uncluttered. Process layout was efficient and smooth. All five plants required some form of safety approval by the safety director for equipment design, plant layout, and operations. All plants had very good preventive maintenance programs for their production equipment. Use of personal protective equipment was prevalent in areas where there were physical and chemical hazards. Such equipment was made accessible to workers, and its use was promoted by teaching workers about exposure to on-the-job hazards.

With regard to safety and housekeeping inspections, the results of the previous two studies were somewhat unclear. The questionnaire survey indicated that low-accident rate plants had less formal but more frequent plant inspections, while the site visit findings indicated the reverse -low-accident rate plants had more formal inspections with frequency being about equal. The results of the present study may clarify this apparent discrepancy. Most of the five plants surveyed had both daily, informal inspection of work areas by line supervision, and periodic (typically monthly or quarterly), formal inspections by worker/management teams which utilized checklists, etc. and were considerably more thorough. Some of the larger plants had yearly plant-wide safety audits in which all aspects of the plants' safety programs were critically evaluated. In other words, "inspection" in the best plants was a continuous and pervasive set of program activities designed to encourage all employees to be consciously critical observers and safe performers.

Four of the five plants had some formal program of safety training for their employees. All five plants had some informal supervisor-conducted safety orientation for new and transferred employees. Techniques and materials used for safety training varied greatly from plant to plant. One company had safety training only for employees involved in "hazardous" occupations such as machine tending. Another had no specific safety training course, but used specific hazard information gained from its job safety analyses of specific jobs to develop safety checklists which were discussed with the employees periodically. One company had an extremely detailed two-week safety training program for new employees. This program is derived from job safety analyses and devotes 50% of the course to proper machine operation and care and 50% to safety hazards.

The previous site-visit study indicated that while the high-accident-rate plants more often used supervisors to train new employees, the low-accident-rate plants more often used lead workers. This finding was somewhat contrary to most recommended safety training programs, including that of the National Safety Council. These typically stress the use of the first-line supervisor for training of new employees. This matter was discussed somewhat equivocally in the prior study. The present survey helps to clarify this apparent contradiction. It shows that all five plants used the supervisor for new employee training. Such training typically involved an orientation and trial performance period until the worker was able to perform adequately on his own. Orientation included introduction to the plant's safety policy and general safety work rules. In addition, supervisors thoroughly discussed with the new employee specific safety work rules developed from plant-wide job hazard analyses. Refresher safety training through speakers, films, videotapes of unsafe practices or conditions, information handouts, updates of work rules, etc., were generally available to all employees, including supervisors, on a continuing basis.

Four plants had formal safety training sessions for supervisors. Most plants offered organizational development courses to all managers and supervisors in order to promote better employee communication and organizational effectiveness.

Finally, all five plants had evaluations of safety performance as an integral part of regular performance ratings at all levels, from the plant manager down to the individual production worker. Indeed, safety was used as a performance criterion of operational efficiency. While the techniques for evaluation were different from plant to plant, the evaluation was done regularly and the results of the evaluation were generally fed back to all employees.

In the previous site-visit study, it became apparent that the majority of the low-incidence rate companies had reasonably good profitability in their products. All five National Safety Council no-lost-time companies had a strong share of very stable markets and had good profit margins. An example of this was the 18.1% of total net sales which one company had as

net income. None of the companies with good safety records was found to be losing money. All five no-lost-time companies were large national or international, publicly held companies with good standings in the investment market. They all had excellent capital investment potential. Of the seven high-incidence rate companies in the earlier Wisconsin study, five were family-owned, one was a closely held stock company and one was an international corporation. It is difficult to spend a great deal of time and money managing safety when a company is financially limited and more involved in basic financial survival management. Management of safety is obviously easier if there are adequate resources available with which to work.

C. Employee Relations and Safety Motivation

Employee relations (and motivation) involve a complex set of problems. However, on an operational level there are several very useful concepts which seem to be supported by this survey and the previous surveys:

(1) People work more safely when they are involved in decision-making processes. This does not mean that they must personally make the decisions. It means that they have to be given a channel to communicate their thoughts to management and receive positive feedback from management.

(2) People work more safely when they have specific and reasonable responsibilities, authority, and goals. They like to know what is expected of them, the resources available, and the standards by which their work will be evaluated.

(3) People are more highly motivated and work more safely when they have immediate feedback on their work. They like to know where they stand.

(4) People like to feel important, needed, and wanted. They need to know that the organization cares about their well-being as individuals. They perform more safely on the job when they are secure.

All five plants had good relations with their employees because they attempted to communicate with their employees in positive "humanistic" ways. All plants had a means for workers to communicate hazards. Four out of the five involved their employees and management together in plant inspection, hazard identification programs, and safety committee activities. They provided direct and immediate channels of communication and positive employee/management interaction. All five used publicity of their accident-free record as feedback. Four plants preferred immediate worker performance feedback as an incentive. Management in five plants felt verbal discipline was the most effective and direct punishment, while three felt firing was the least effective punishment. Thus, all plants used some form of immediate feedback to motivate their employees.

All five plants had higher than average area pay and fringe benefit plans. Three plants had employee alcohol and drug programs. Three plants had actively initiated or aided community safety efforts. Thus, the plants were demonstrating through action programs their concern for employee well-being.

The Cohen et al. (1975) study showed that the low-accident rate plants were to use a variety of monetary incentives to promote safe work behavior. The present study, however, showed that among the industry leaders in accident-free man-hours, use of monetary safety incentives was played down. Management frequently expressed the opinion that safety contests, give-away prizes, and once-a-year dinners simply do not work. Both the questionnaire and site visits showed that the best plants preferred informational materials to safety contests or recognition awards for eliciting worker safety awareness. Feedback on individual and group safety performance was regarded as particularly effective in this regard. Job safety information appears to be effective because it not only stimulates safety awareness, but unlike tangible rewards, it has instructional value as well.

The site visits showed that a very effective way to promote plant safety was to involve the workers in safety program planning and implementation. Through active participation, workers are more likely to be continually reminded about safety in general and specific safe work procedures in particular. Active worker participation also stimulates better communication and relations with management. Workers are a valuable source of safety information, particularly operations about which they are most familiar. They can play a significant role in hazard identification. In addition, worker participation brings safety issues to light before they become problems or grievances and promotes worker acceptance of needed countermeasures, e.g., use of ear protection in hazardous areas.

Successful safety programs in all three studies were typified by a "humanistic" approach to employee management. This factor, which is very much related to management commitment to safety, was expressed in a variety of ways. The first study showed that low-accident-rate plants were more tolerant in disciplining safety rule violators and perceived harsh discipline (termination) as less effective than other courses of punitive action (verbal reprimand). The second study amplified this finding by showing that in the low-accident-rate plants, there was better communication between workers and management in a generally more congenial atmosphere. The present study expanded this finding still further. In all aspects of employee relations, management showed deep concern for all workers' well-being. It is significant, for example, that in all five plants safety was administered as a personnel/human relations function. Strong employee relations were fostered by good benefits and pay, opportunities for upgrading and advancement, existence of individual counseling, and community involvement programs. Workers and management freely communicated on a first-name basis. Worker/management teams worked cooperatively on a number of safety program activities. It is generally believed, in the psychological literature, that a "humanistic" management climate acts as a powerful employee motivator. It is no accident, therefore, that such factors were found to be associated with successful plant safety performance.

Although similar safety program organizational structures and techniques were used by the five record-holding companies. No safety program was quite like any other. However, all had one major thing in common, safety in each instance was a real priority in corporate policy and action. Organizational safety practices were thus intrinsic to ongoing production and management goals. New employee training and orientation, ongoing safety training, worker promotion criteria involving safe behavior ratings, safety considerations for new equipment purchases and process redesign, etc.—all exemplify safety program features which have a direct, continuous and vital role in corporate activities. Whenever meetings were held, goals set, decisions made, or performances evaluated, safety was an integral, not an isolated part, of the organizational decision-making process. Thus, in order to be most effective, safety must be integrated into the total management system——not tacked on as a legal necessity, band-aid fix, or afterthought of corporate design.

The five plants involved in this survey shared some general characteristics which appear to represent basic elements in successful safety programs. First, the programs set safety goals, assigned safety responsibilities, provided adequate resources, and evaluated safety performance. Second, they identified problems, pre-planned solutions, and evaluated management and employee effectiveness. Finally, the programs motivated and included employees.

CONCLUSIONS

The findings of this survey corroborated and extended findings of previous studies which also sought to identify characteristics associated with superior safety performance. Among these were the following:

(1) A strong management commitment to safety expressed not only through stated policy and adequate financial support, but through active involvement in program implementation and demonstrated concern for worker well-being.

(2) Efficient hazard identification, engineering control, job safety training, and safety evaluation programs designed to anticipate and manage hazards, not just to count and investigate accidents (after the fact).

(3) An effective employee communication, feedback and involvement program designed to motivate management and employees to deal with one another and safety problems in positive "humanistic" ways.

(4) A safety program which is "integrated" into the larger management system and is designed to deal with safety as an intrinsic part of plant operations.

REFERENCES

Anon. Work Injury Rates. National Safety Council, Chicago, IL. 1975.

Cohen. A., Smith, M.J. and Cohen, H.H. Safety Program Practices in High Versus Low Accident Rate Companies - An Interim Report (Questionnaire Phase). HEW Publication No. (NIOSH) 75-185, June 1975.

Smith, J.J., Cohen, H.H., Cohen, A., and Cleveland, R.J. Characteristics of Successful Safety Programs. J. Safety Research. 10 (1):5-15, Spring 1978.

The questions used in the mail-out questionnaire and tables summarizing the responses.

QUESTION NO. 1

Code #_____

1. What training is required for persons who have responsibility for designing or directing safety programs in your plant?

   a. No special training

   b. Experience gained by coming up through the ranks

   c. Specific college or training courses related to safety

   d. Satisfactory completion of training programs offering certificate in industrial safety

   e. Bachelor's degree in a field related to safety, e.g., industrial or safety engineering, industrial hygiene, etc.

   f. Master's degree in a field related to safety

   g. Other (specify)_____

ANSWERS TO QUESTION NO. 1

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A		1											
PLANT B							1						
PLANT C	1												
PLANT D		1	1										
PLANT E		1	1		1								
OVERALL	1	3	2		1		1						

QUESTION NO. 2

Code #_____

2. From whom do workers directly receive safety training and safety information?

   a. Worker's Supervisor

   b. Safety Personnel

   c. Fellow Workers

   d. Plant Management

   e. Plant Medical Personnel

   f. Union Representatives

   g. Other (specify)_____

ANSWERS TO QUESTION NO. 2

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1	1	1	1								
PLANT B	1	1		1									
PLANT C	1												
PLANT D	1	1	1										
PLANT E	1	1	1	1	1								
OVERALL	5	4	3	3	2								

QUESTION NO. 3

Code #_____

3. Does your company have its own safety manual or code of safety rules?

   a. Yes

   b. No

ANSWERS TO QUESTION NO. 3

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5	0											

QUESTION NO. 4

Code #_____

4. In your plant, who is considered to be primarily responsible for safety of employees?

   a. Employee himself

   b. Employee's supervisor

   c. Plant management

   d. Safety personnel

   e. Union

   f. Other (specify)_____

ANSWERS TO QUESTION NO. 4

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A			1										
PLANT B			1										
PLANT C	1		1										
PLANT D	1												
PLANT E						1							
OVERALL	2		3			1							

OUESTION NO. 5

Code #_____

5. How many persons at your plant have full or part-time responsibility for designing or directing safety programs?

Full-time (number)

Part-time (number)

Average percentage of time devoted to safety (for those with part-time responsibility)

ANSWERS TO QUESTION NO. 5

	Full	Part	% of Duties	d	e	f	g	h	i	j	k	l	m
	a	b	c										
PLANT A	3	895*	5-10%										
PLANT B	.5	28											
PLANT C		2	15%										
PLANT D	1												
PLANT E	5	2	40%										
OVERALL	9.5	927											

*All plant supervisors

QUESTION NO. 6

Code #_____

6. At what organization level is the highest ranking person in your plant with full or part-time responsibility for designing or directing safety programs?

   a. Top level plant management (individual reporting directly to top official of your plant)

   b. Middle level plant management (individual reporting directly to top level plant management)

   c. Lower level plant management (individual reporting directly to middle level plant management)

   d. No one in our plant has full-time responsibility for safety

ANSWERS TO QUESTION NO. 6

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C			1										
PLANT D		1											
PLANT E		1											
OVERALL	2	2	1										

QUESTION NO. 7

Code #_____

7. Are safety figures, reports, achievements included on the agenda of plant management meetings?

   a. Yes, on a regularly scheduled basis

   b. Yes, on an occasional basis

   c. Yes, only as needed

   d. No

   e. Other (specify)_____

ANSWERS TO QUESTION NO. 7

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C			1										
PLANT D	1												
PLANT E	1												
OVERALL	4		1										

QUESTION NO. 8

Code #_____

Question 8 may be difficult to answer. If no objective data are available, please provide your best guess.

8. Has your safety program had a beneficial effect on reducing overall operational costs?

   a. Yes, based on objective data (If yes, complete question 9 and omit question 10)

   b. Yes, based on best guess (If yes, complete question 9 and omit question 10

   c. No, based on objective data (If no, omit question 9 and complete question 10)

   d. No, based on best guess (If no, omit question 9 and complete question 10)

ANSWERS TO QUESTION NO. 8

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A		1											
PLANT B		1											
PLANT C				1									
PLANT D		1											
PLANT E	1												
OVERALL	1	3		1									

QUESTION NO. 9

Code #_____

9. What has been the approximate percentage savings?

   a. Less than one percent

   b. Between one and three percent

   c. More than three percent but less than five percent

   d. Between five and ten percent

   e. More than ten percent

ANSWERS TO QUESTION NO. 9

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A					1								
PLANT B			1										
PLANT C	NO	RESP	ONSE										
PLANT D					1								
PLANT E		1											
OVERALL		1	1		2								

QUESTION NO. 10

Code #_____

10. Do you believe that operational costs can be reduced by an effective safety program?

    a. Yes

    b. No

ANSWERS TO QUESTION NO. 10

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C		1											
PLANT D	1												
PLANT E	NO RESPONSE												
OVERALL	3	1											

OUESTION NO. 11

Code #_____

11. Which of the following groups participate formally in the development of safety programs and practices?

a. Workers

b. Supervisors

c. Union representatives

d. Management

e. Other (specify)_____

ANSWERS TO QUESTION NO. 11

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1		1									
PLANT B	1	1		1									
PLANT C				1									
PLANT D	1	1		1									
PLANT E	1	1		1	1	(Safety Personnel)							
OVERALL	4	4		5	1								

QUESTION NO. 12

Code #_____

12. Which of the following do you use as incentives to worker safety:

a. Safety attitude and behavior included in worker performance evaluation

b. Running tally of accident free man-hours

c. Recognition awards, e.g., certificates, medals, dinners, etc.

d. Cash awards or prizes

e. Publicity of outstanding safety performance

f. Other (specify)_____

ANSWERS TO QUESTION NO. 12

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1	1	1	1								
PLANT B	1	1	1	1	1	1							
PLANT C		1											
PLANT D	1	1	1		1								
PLANT E	1	1	1	1	1								
OVERALL	4	5	4	3	4	1							

QUESTION NO. 13

13. Which of those incentives marked in question 12 do you consider most effective? Place a "1" after the most effective, a "2" after the second most effective, and a "3" after the third most effective.

ANSWERS TO QUESTION NO. 13

	a	b	c	d	e	f	g	h	i
Plant A	1		3		2				
Plant B		1	3		2				
Plant C		1*							

*No other incentives are used

Plant D	1	2	3						
Plant E	1		3		2				

OUESTION NO. 14

Code #_____

14. Which of the following is used in promoting job safety:

a. Posters/signs/slogans

b. Pamphlets/circulars

c. Displays/exhibits

d. Safety contests between departments or work groups

e. Safety contests between plants

f. Other (specify) _____

ANSWERS TO QUESTION NO. 14

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1	1	1									
PLANT B	1	1	1		1								
PLANT C	1												
PLANT D	1	1	1			1*							
PLANT E	1	1	1	1	1								
OVERALL	5	4	4	2	2	1							

*Continually making improvements in process and equipment

QUESTION NO. 15

15. Which of those means marked in question 14 do you consider most effective? Place a "1" after the most effective, a "2" after the second most effective, and a "3" after the third most effective.

ANSWERS TO QUESTION NO. 15

	a	b	c	d	e	f	g	h	i
Plant A	1	3	2						
Plant B	1		2		3				
Plant C	1*								
Plant D	3			2		1			
Plant E	2	3		1					

*This is the only information source used

QUESTION NO. 16

Code #_____

16. Does your plant have an occupational alcoholism program?

a. Yes

b. No (If no, omit question 17)

ANSWERS TO QUESTION NO. 16

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B		1											
PLANT C		1											
PLANT D	1												
PLANT E	1												
OVERALL	3	2											

QUESTION NO. 17

Code #_____

17. Do you feel this program has had a beneficial effect on plant safety?

a. Yes

b. No

c. Too early to assess

ANSWERS TO QUESTION NO. 17

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	NO	RESPONSE											
PLANT C	NO	RESPONSE											
PLANT D	1												
PLANT E	1												
OVERALL	3												

QUESTION NO. 18

Code #_____

18. Does your plant have an occupational drug abuse program?

a. Yes

b. No (If no, omit question 19)

ANSWERS TO QUESTION NO. 18

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B		1											
PLANT C		1											
PLANT D		1											
PLANT E	1												
OVERALL	2	3											

QUESTION NO. 19

Code #_____

19. Do you feel this program has had a beneficial effect on plant safety?

a. Yes

b. No

c. To early to assess

ANSWERS TO QUESTION NO. 19

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A			1										
PLANT B	NO RESPONSE												
PLANT C	NO RESPONSE												
PLANT D	NO RESPONSE												
PLANT E	1												
OVERALL	1		1										

QUESTION NO. 20

Code #_____

20. Do you feel that the worker's family and/or the outside community can have a beneficial effect on worker safety performance?

a. Yes

b. No

ANSWERS TO QUESTION NO. 20

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5	0											

QUESTION NO. 21

Code #_____

21. Has your plant initiated or aided family or community efforts to instill worker safety consciousness?

a. Yes

b. No

ANSWERS TO QUESTION NO. 21

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C		1											
PLANT D		1											
PLANT E	1												
OVERALL	3	2											

QUESTION NO. 22

Code #_____

22. Do you have a formal safety training program, i.e., written procedures describing how the safety training is to be carried out?

a. Yes

b. No

ANSWERS TO QUESTION NO. 22

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C		1											
PLANT D	1												
PLANT E	1												
OVERALL	4	1											

QUESTION NO. 23

Code #_____

23. Do supervisors receive training in overseeing the safety of their work group?

a. Yes

b. No

ANSWERS TO QUESTION NO. 23

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C		1											
PLANT D	1												
PLANT E	~~1~~												
OVERALL	4	1											

OUESTION NO. 24

Code #_____

24. Which of the following techniques of safety training do you employ?

a. Lecture
b. Demonstration
c. Group discussions
d. Literature/Manuals
e. Movies/Slides
f. Instruction by supervisors
g. Instruction by fellow workers
h. Instruction by safety personnel
i. Other (specify)_____

ANSWERS TO QUESTION NO. 24

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1	1	1	1	1	1	1					
PLANT B			1	1	1	1		1					
PLANT C									1*				

*Safety course

PLANT D	1	1	1	1	1	1		1	1*				

*Supervisors attend safety training programs conducted by local safety council, ASSE meetings, corporate training programs and Red Cross first-aid training programs

PLANT E	1	1	1	1	1	1	1	1					
OVERALL	3	3	4	4	4	4	2	4	2				

QUESTION NO. 25

25. Which of those techniques marked in question 24 do you consider most effective? Place a "1" after the most effective, a "2" after the second most effective, and a "3" after the third most effective.

ANSWERS TO QUESTION NO. 25

	a	b	c	d	e	f	g	h	i
Plant A			3	2			1		
Plant B			3			1		2	
Plant C									1
Plant D		2						3	1
Plant E						1	2	3	

OUESTION NO. 26

Code #_____

Safety training may be offered to employees one or more times. In question 26, the term initial safety training refers to training offered before the worker begins a job or work task.

26. To whom is initial safety training made available?

a. To all new employees
b. To all new production employees
c. To new employees in particularly dangerous jobs
d. To production employees reassigned to new jobs
e. To production employees using new machinery or whose work procedures have changed
f. Other (specify)_____

ANSWERS TO QUESTION NO. 26

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1	1	1	1								
PLANT B	1												
PLANT C		1											
PLANT D	1	1	1	1	1	1*							
PLANT E	1	1	1	1	1								
OVERALL	4	4	3	3	3	1							

*New technical personnel

OUESTION NO. 27

Code #_____

In question 27, continuing safety training refers to training given to workers who have been performing the same job for some time.

27. Who receives continuing safety training in your plant?

a. All employees
b. Employees in jobs where accidents can occur
c. Employees in high accident risk jobs
d. Employees in jobs where accidents have occurred recently
e. Employees who have had accidents or near accidents recently
f. No continuing training is offered

ANSWERS TO QUESTION NO. 27

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1	1	1	1								
PLANT B	1												
PLANT C						1*							
PLANT D	1												
PLANT E	1	1	1	1	1								
OVERALL	4	2	2	2	2	1							

*No continuous training is offered other than a safety course

QUESTION NO. 28

Code #_____

28. Are specific safety training procedures tailored for specific jobs?

a. Yes

b. No

ANSWERS TO QUESTION NO. 28

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5	0											

OUESTION NO. 29

Code #_____

29. In your training program do you make use of information on safety available from:

a. National Safety Council?
b. Local Safety Council?
c. Professional associations?
d. Trade associations?
e. Unions?
f. Insurance carrier?
g. Governmental agency?
h. Other (specify)_____

ANSWERS TO QUESTION NO. 29

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1		1	1			1						
PLANT B	1	1						1*					
PLANT C	1												
PLANT D	1	1	1			1	1	1*					
PLANT E	1	1	1	1		1	1	1*					
OVERALL	5	3	3	2		2	3	3					

*Corporate safety information department

*Corporate safety department

*Corporate safety

OUESTION NO. 30

Code #_____

30. Indicate those sources of information marked in question 29 that you feel are particularly useful in accident control in your plant.

ANSWERS TO QUESTION NO. 30

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1		1				1						
PLANT B								1*					
PLANT C	1												
PLANT D	1	1	1				1						
PLANT E	1		1			1	1						
OVERALL	4	1	3			1	3	1					

*Corporate safety information department

QUESTION NO. 31

Code #_____

31. Are design plans for new work facilities or proposed renovations of existing installations subject to the approval of safety personnel before construction is started?

    a. Always

    b. Often

    c. Occasionally

    d. Never

ANSWERS TO QUESTION NO. 31

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5												

QUESTION NO. 32

Code #_____

32. Do safety personnel have to approve new or modified work processes before they are put in operation?

a. Always

b. Often

c. Occasionally

d. Never

ANSWERS TO QUESTION NO. 32

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A		1											
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E		1											
OVERALL	3	2											

QUESTION NO. 33

Code #_____

33. Are safety features included in the specifications for new equipment purchases?

a. Always

b. Often

c. Occasionally

d. Never

ANSWERS TO QUESTION NO. 33

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5												

QUESTION NO. 34

Code #_____

34. Do safety personnel have to approve newly installed equipment before it is used?

a. Always

b. Often

c. Occasionally

d. Never

ANSWERS TO QUESTION NO. 34

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E		1											
OVERALL	4	1											

QUESTION NO. 35

Code #_____

35. Do safety personnel ever inspect to insure that safe practices are being followed?

a. Yes

b. No (If no, omit questions 36, 37, and 38)

ANSWERS TO QUESTION NO. 35

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5	0											

QUESTION NO. 36

Code #_____

36. How often are most areas inspected?

a. Everyday

b. At least once a week

c. At least once a month

d. At least every three months

e. At least every six months

f. At least once a year

g. Less than once a year

ANSWERS TO QUESTION NO. 36

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B			1										
PLANT C					1								
PLANT D	1												
PLANT E		1											
OVERALL	2	1	1		1								

QUESTION NO. 37

Code #_____

7. Do these inspections make use of a written checklist?

   a. Always

   b. Often

   c. Occasionally

   d. Never

ANSWERS TO QUESTION NO. 37

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A		1											
PLANT B	1												
PLANT C	1												
PLANT D			1										
PLANT E	1												
OVERALL	3	1	1										

OUESTION NO. 38

Code #_____

38. Who makes safety inspections?

a. Plant Management
b. Safety Personnel
c. Medical Personnel
d. Supervisors
e. Union Representatives
f. Workers
g. Other (specify)_____

ANSWERS TO QUESTION NO. 38

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1		1		1	1*						
PLANT B	1	1	1	1		1							
PLANT C		1											
PLANT D	1	1		1		1	1*						
PLANT E	1	1	1	1		1							
OVERALL	4	5	2	4		4	2						

*Corporate safety

*Corporate safety

QUESTION NO. 39

Code #_____

9. What is the approximate percentage of the total operational budget in your plant that is specifically ear-marked for safety?

   a. No money specifically ear-marked for safety

   b. Less than one percent

   c. Between one and three percent

   d. More than three percent but less than five percent

   e. Between five percent and ten percent

   f. More than ten percent

ANSWERS TO QUESTION NO. 39

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A		1											
PLANT B	1												
PLANT C		1											
PLANT D			1										
PLANT E		1											
OVERALL	1	3	1										

QUESTION NO. 40

Code #_____

40. Are any personal protective devices used by workers in your plant?

a. Yes

b. No (If no, omit questions 41,42,43,44, and 45)

ANSWERS TO QUESTION NO. 40

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5	0											

QUESTION NO. 41

Code #_____

41. Please mark each of the following devices used by personnel in your plants.

a. Safety shoes

b. Boots

c. Hard hats

d. Gloves

e. Leggings

f. Face protectors

g. Eye protectors

h. Protective creams

i. Ear protectors

j. Aprons

k. Respirators

l. Protective suits

m. Other (specify)

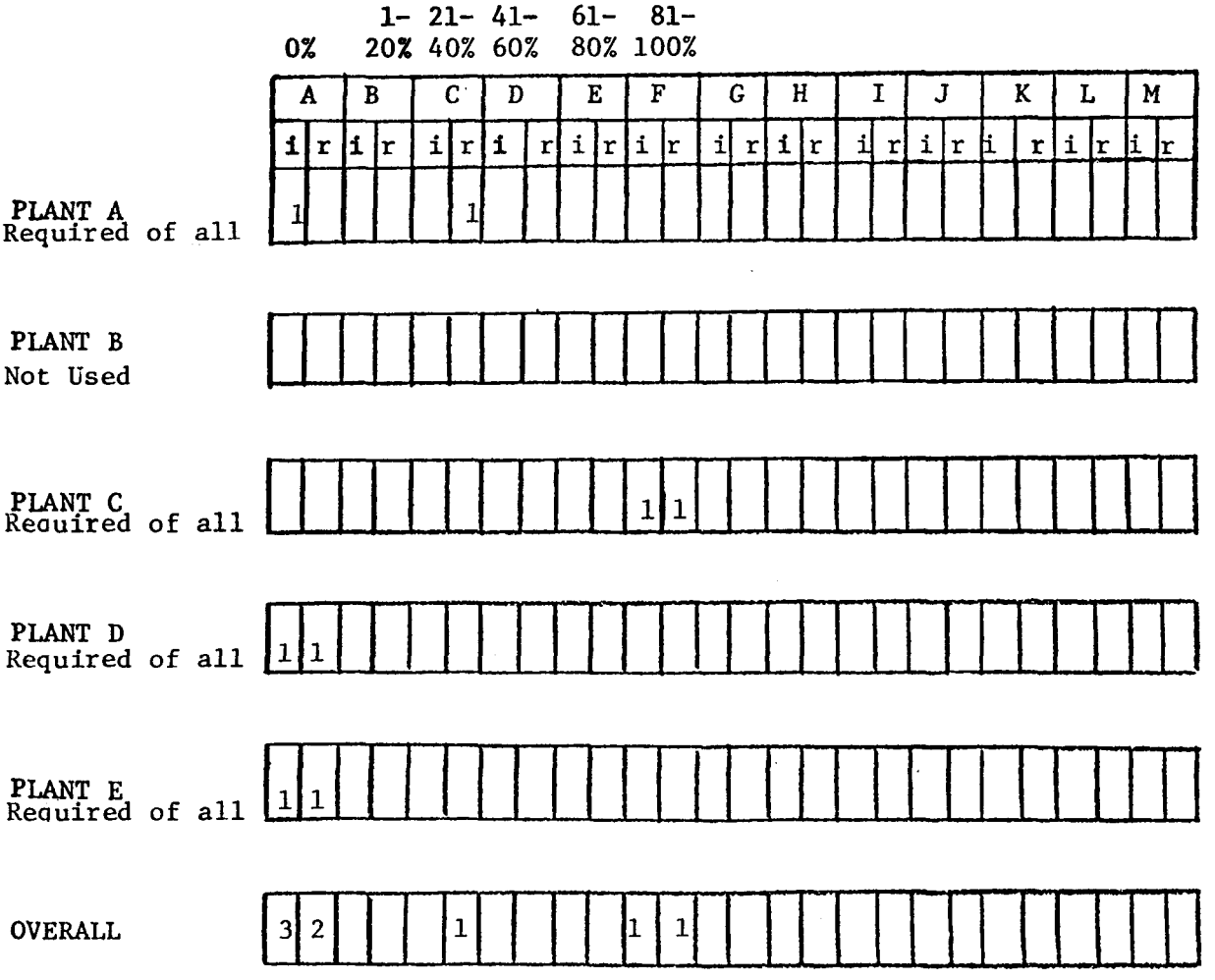
ANSWERS TO QUESTION NO. 41

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1	1	1	1	1	1	1	1	1	1	1	
PLANT B				1			1				1		
PLANT C	1		1	1		1	1	1	1	1	1	1	
PLANT D	1	1	1	1		1	1	1	1	1	1	1	1
PLANT E	1	1	1	1		1	1	1	1	1	1	1	
OVERALL	4	3	4	5	1	4	5	4	4	4	5	4	1

QUESTION NO. 41A

Code #_____

41A. Give percentage of the SAFETY SHOES initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)



i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41B

Code #_____

41B. Give percentage of BOOTS initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)

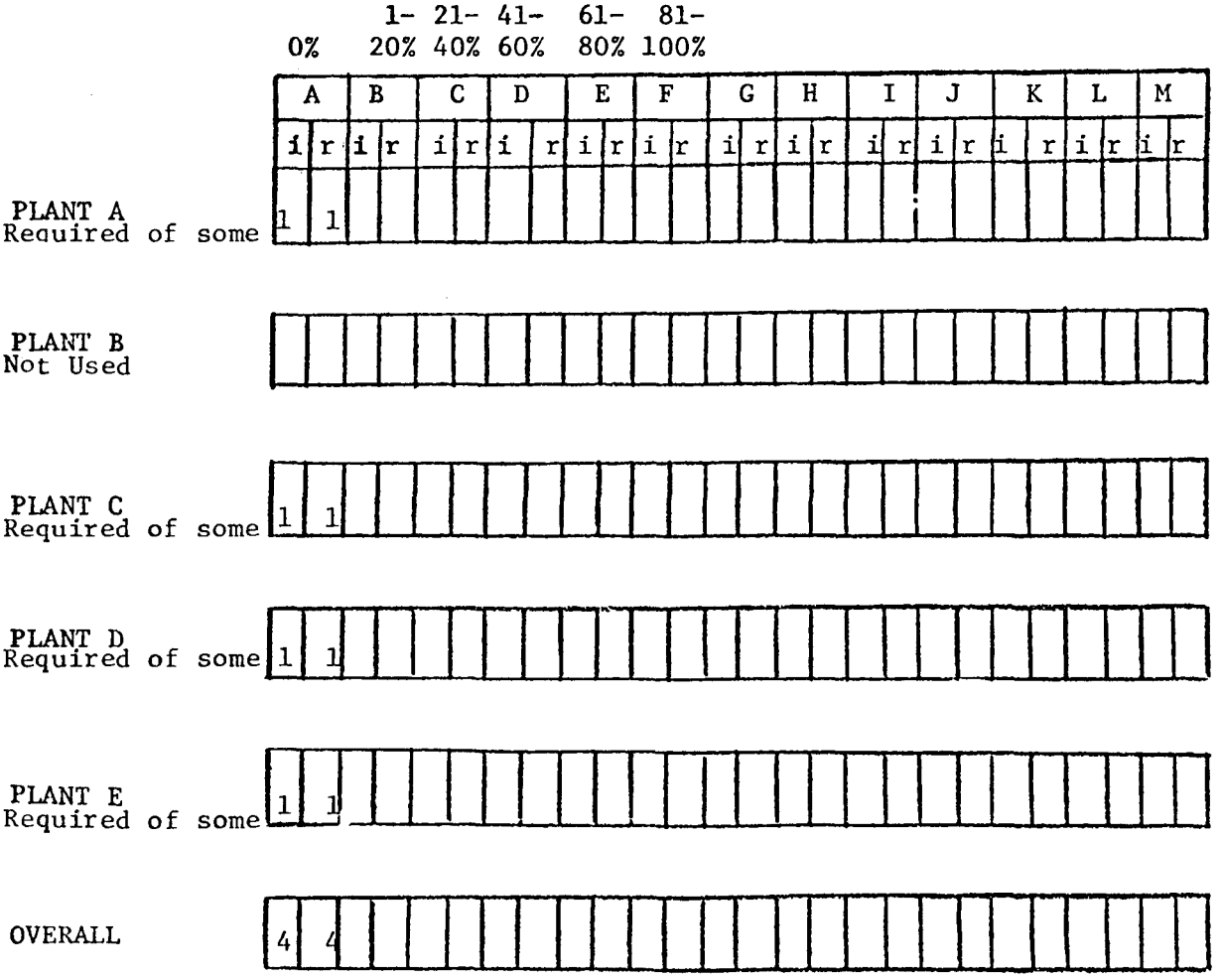
	0%	1-20%	21-40%	41-60%	61-80%	81-100%
	A	B	C	D	E	F	G	H	I	J	K	L	M
	i r	i r	i r	i r	i r	i r	i r	i r	i r	i r	i r	i r	i r
PLANT A Required of some	1 1												
PLANT B Not Used													
PLANT C Not Used													
PLANT D Required of some	1 1												
PLANT E Required of some	1 1												
OVERALL	3 3												

i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41C

Code #_____

41C. Give percentage of the HARD HATS initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)



i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41D

Code #_____

41D. Give percentage of GLOVES initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)

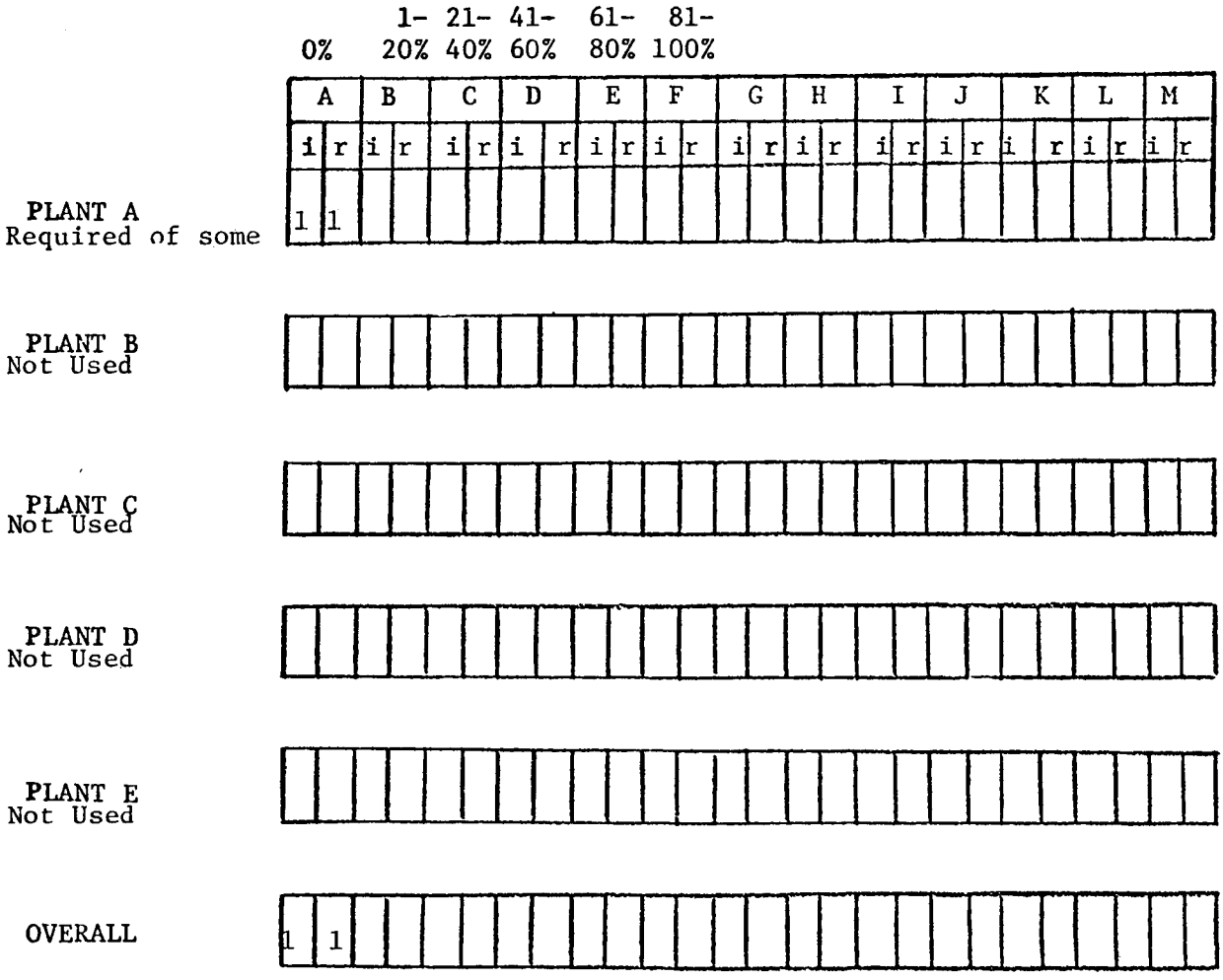
	0%	1-20%	21-40%	41-60%	61-80%	81-100%
	A	B	C	D	E	F	G	H	I	J	K	L	M
	i r	i r	i r	i r	i r	i r	i r	i r	i r	i r	i r	i r	i r
PLANT A Required of some	1 1												
PLANT B Required of some	1 1												
PLANT C Required of some	1 1												
PLANT D Required of some	1 1												
PLANT E Required of some	1 1												
OVERALL	5 5												

i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41E

Code #_____

41E. Give percentage of the LEGGINGS initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)

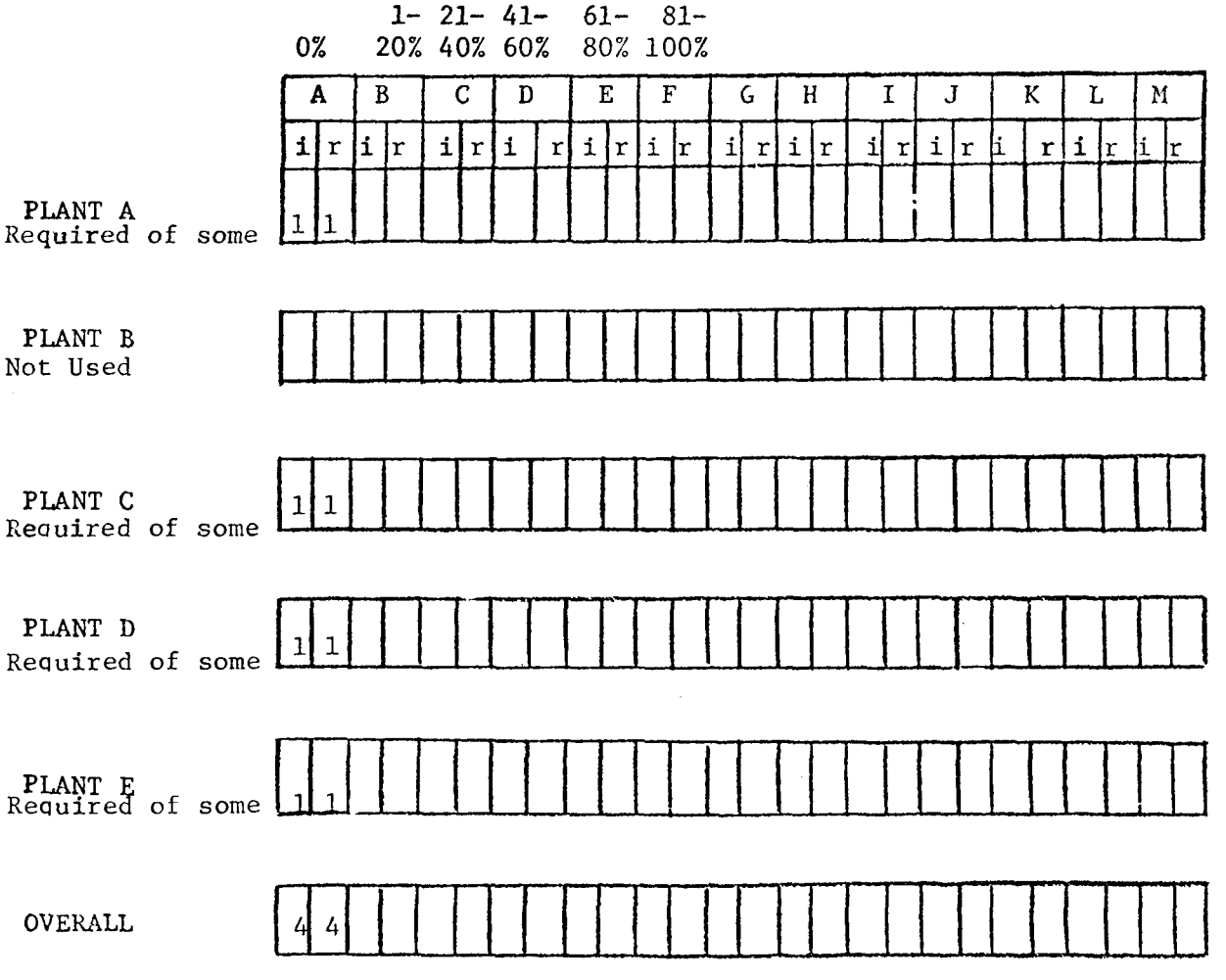


i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41F

Code #_____

41F. Give percentage of the FACE PROTECTORS initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)

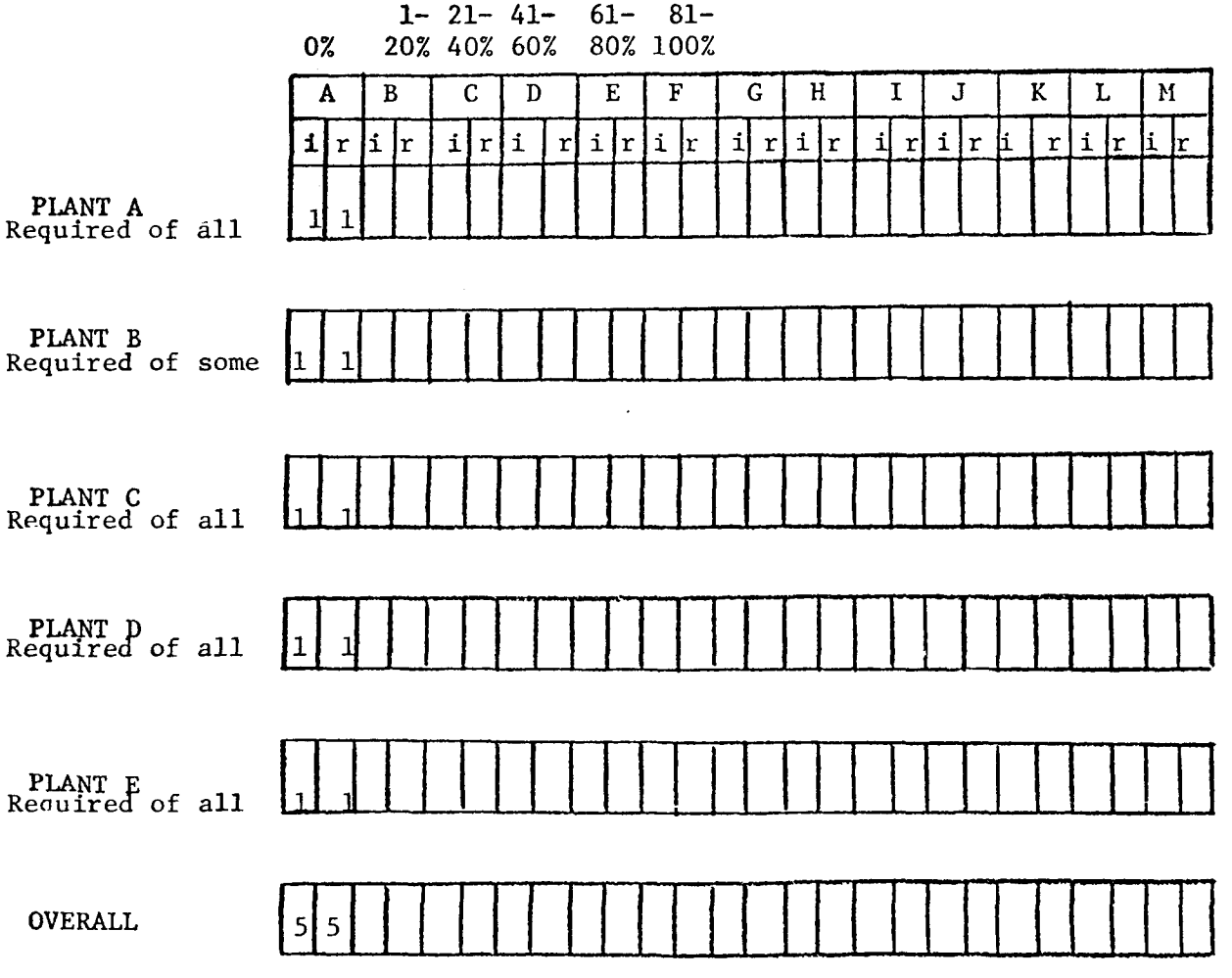


i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41G

Code #_____

41G. Give percentage of the EYE PROTECTORS initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)

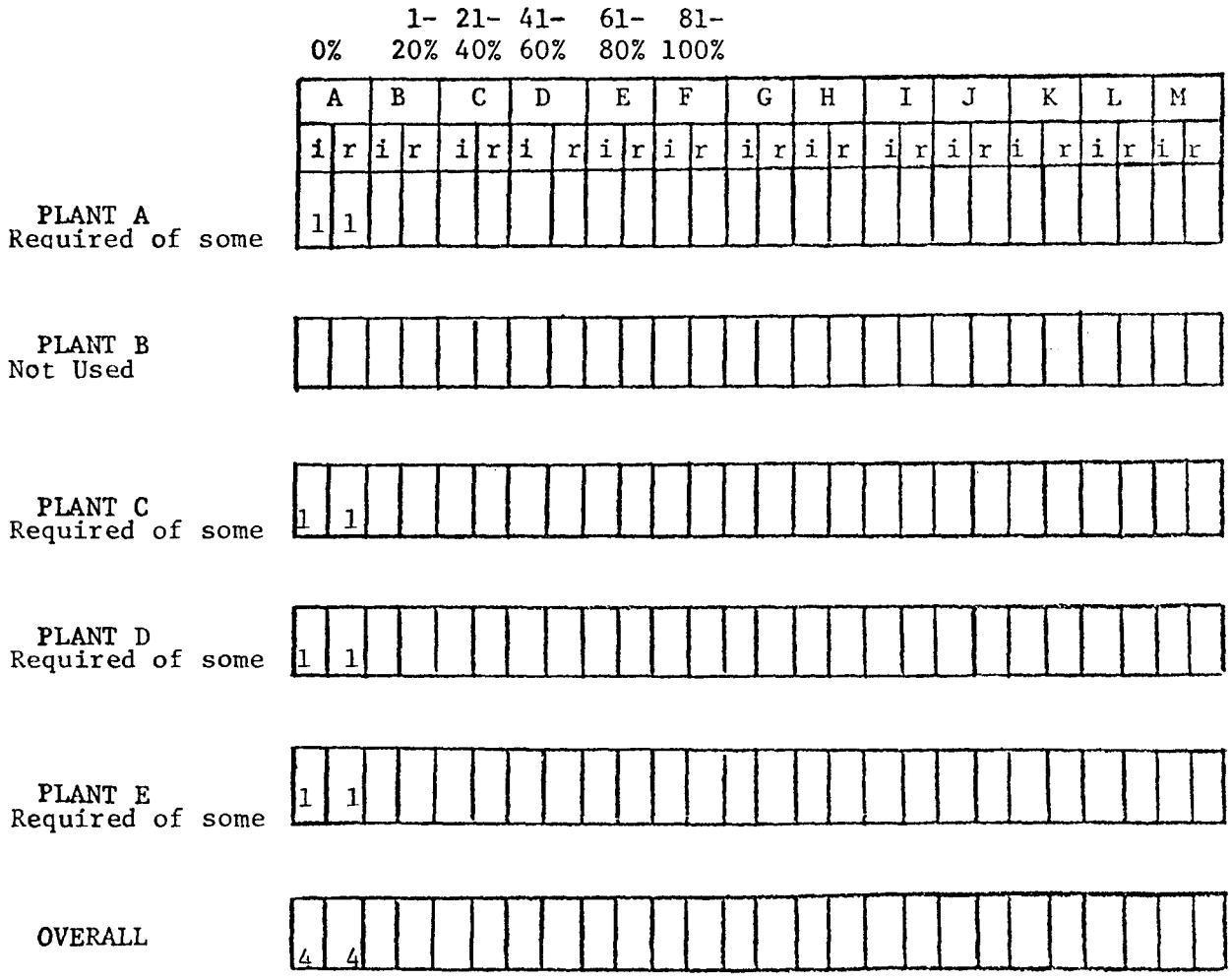


i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41H

Code #_____

41H. Give percentage of the PROTECTIVE CREAMS initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)

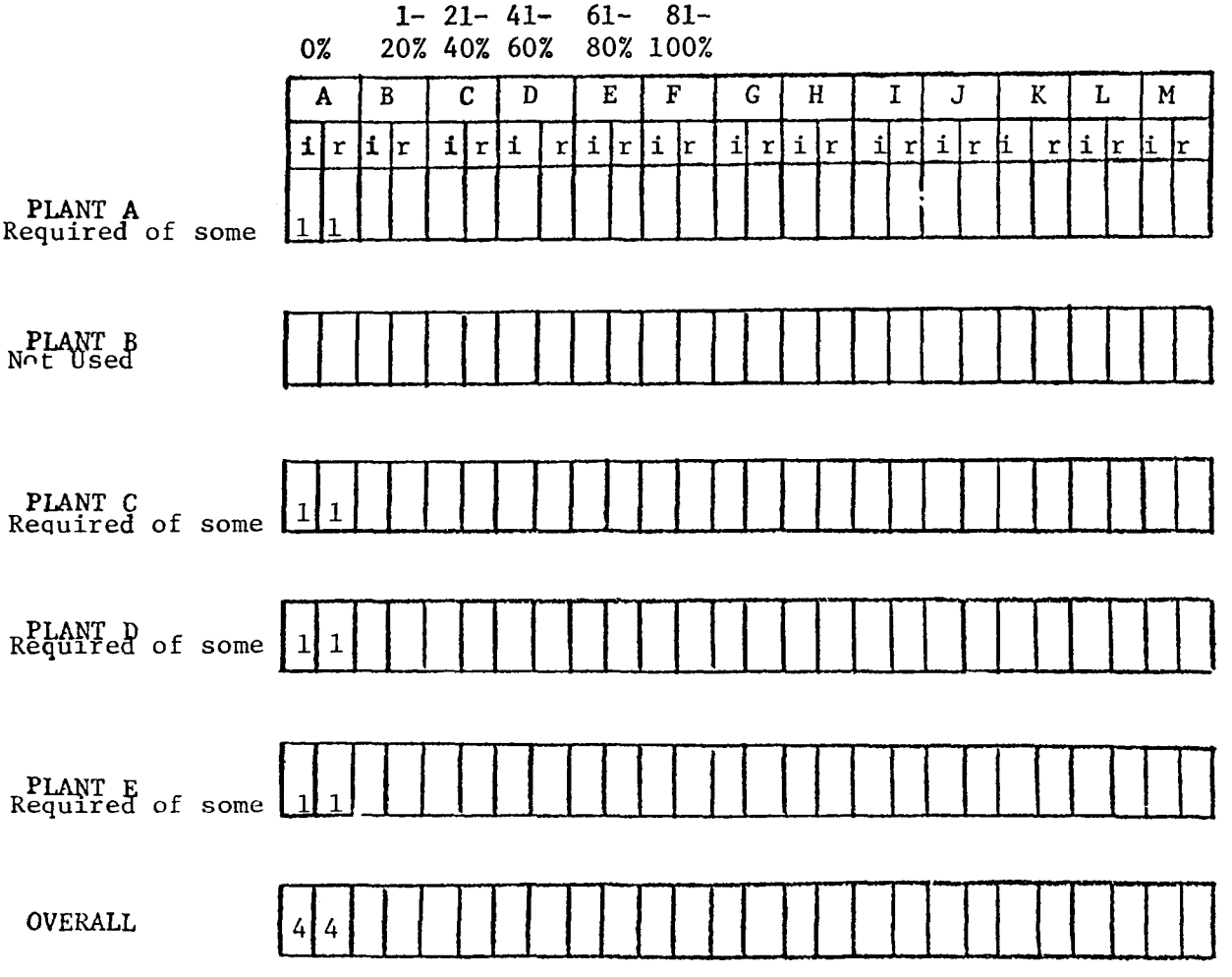


i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41I

Code #_____

41I. Give percentage of the EAR PROTECTORS initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)

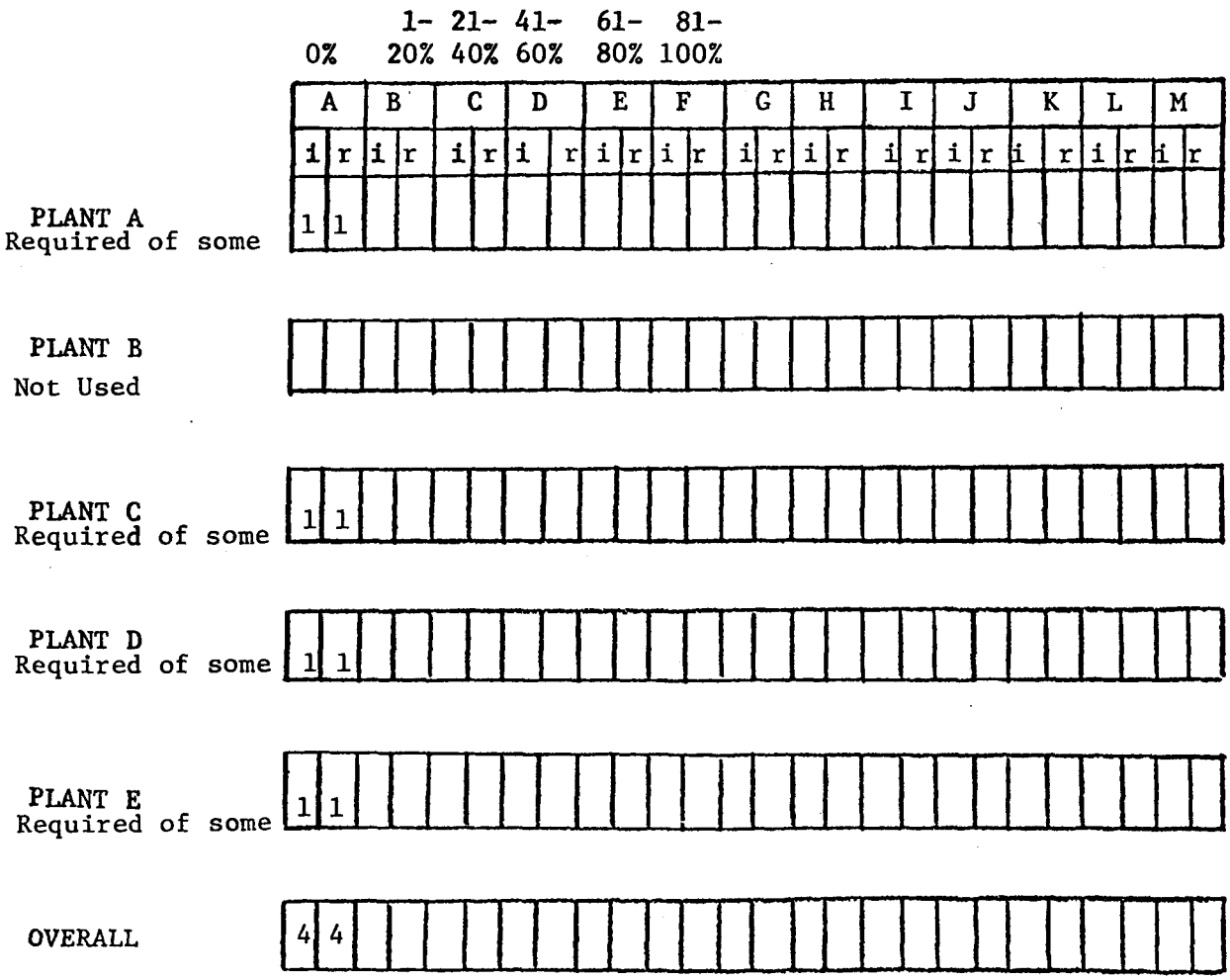


i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41J

Code #_____

41J. Give percentage of the APRONS initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)

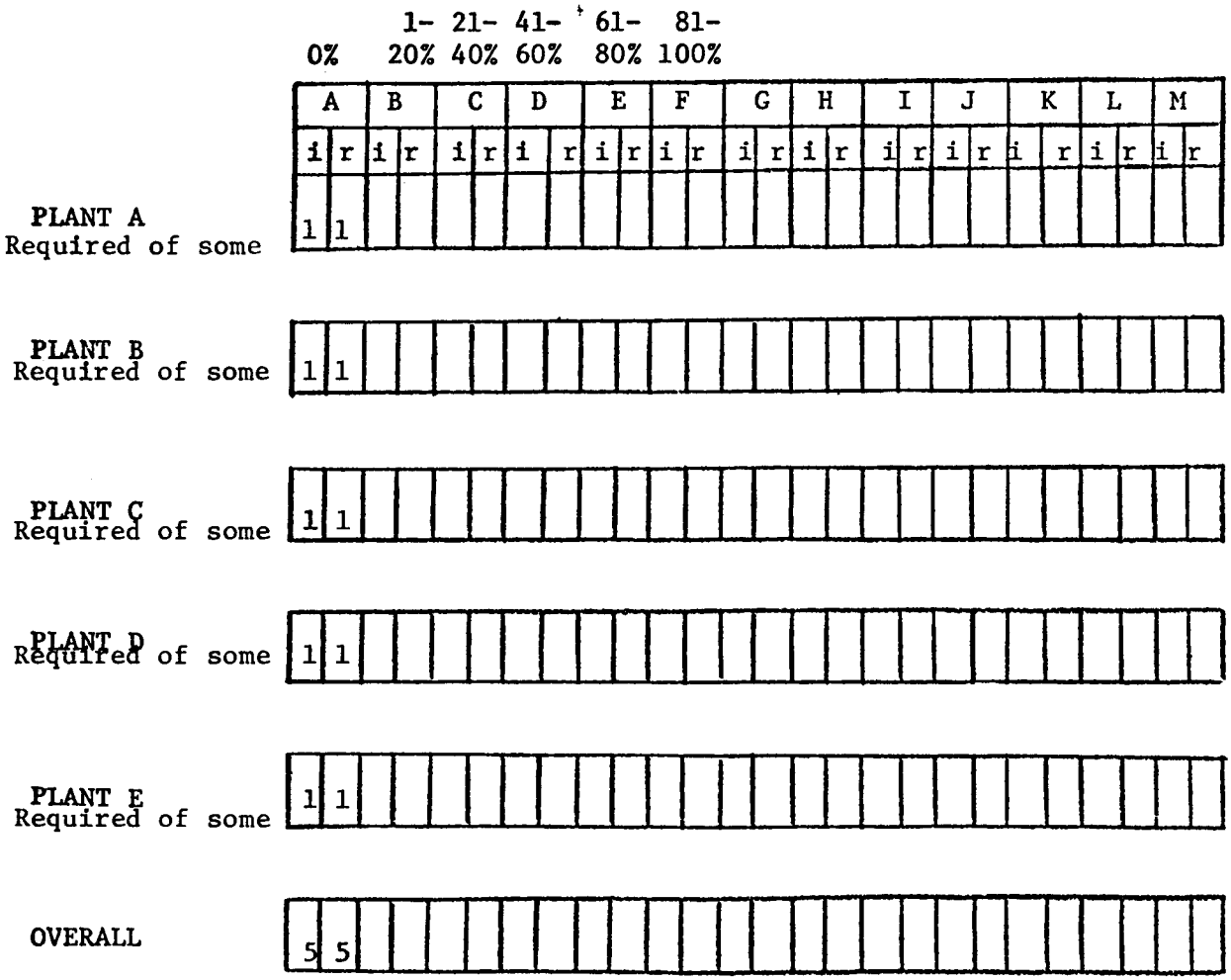


i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41K

Code #_____

41K. Give percentage of the RESPIRATORS initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)

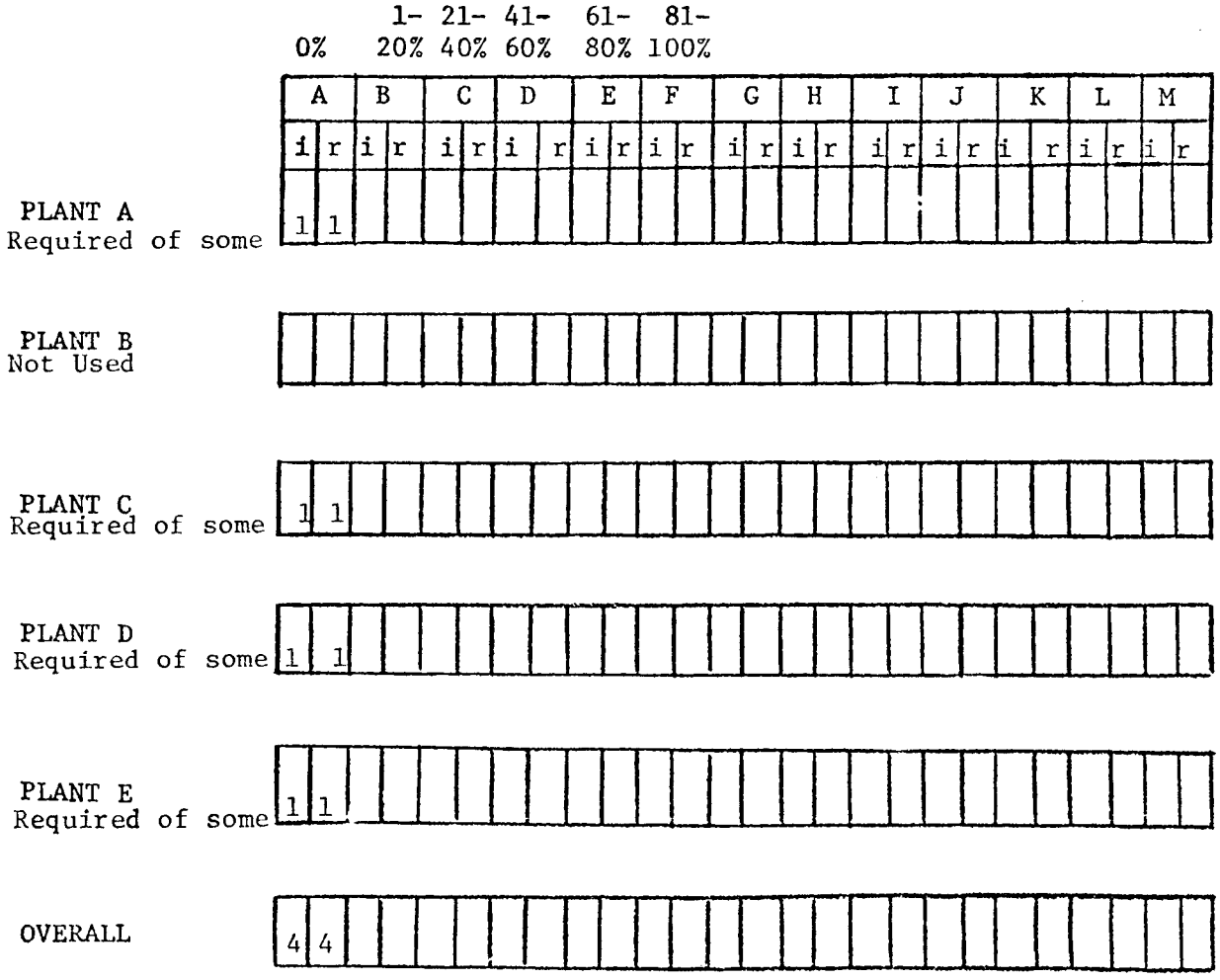


i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41L

Code #_____

41L. Give percentage of the PROTECTIVE SUITS initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)

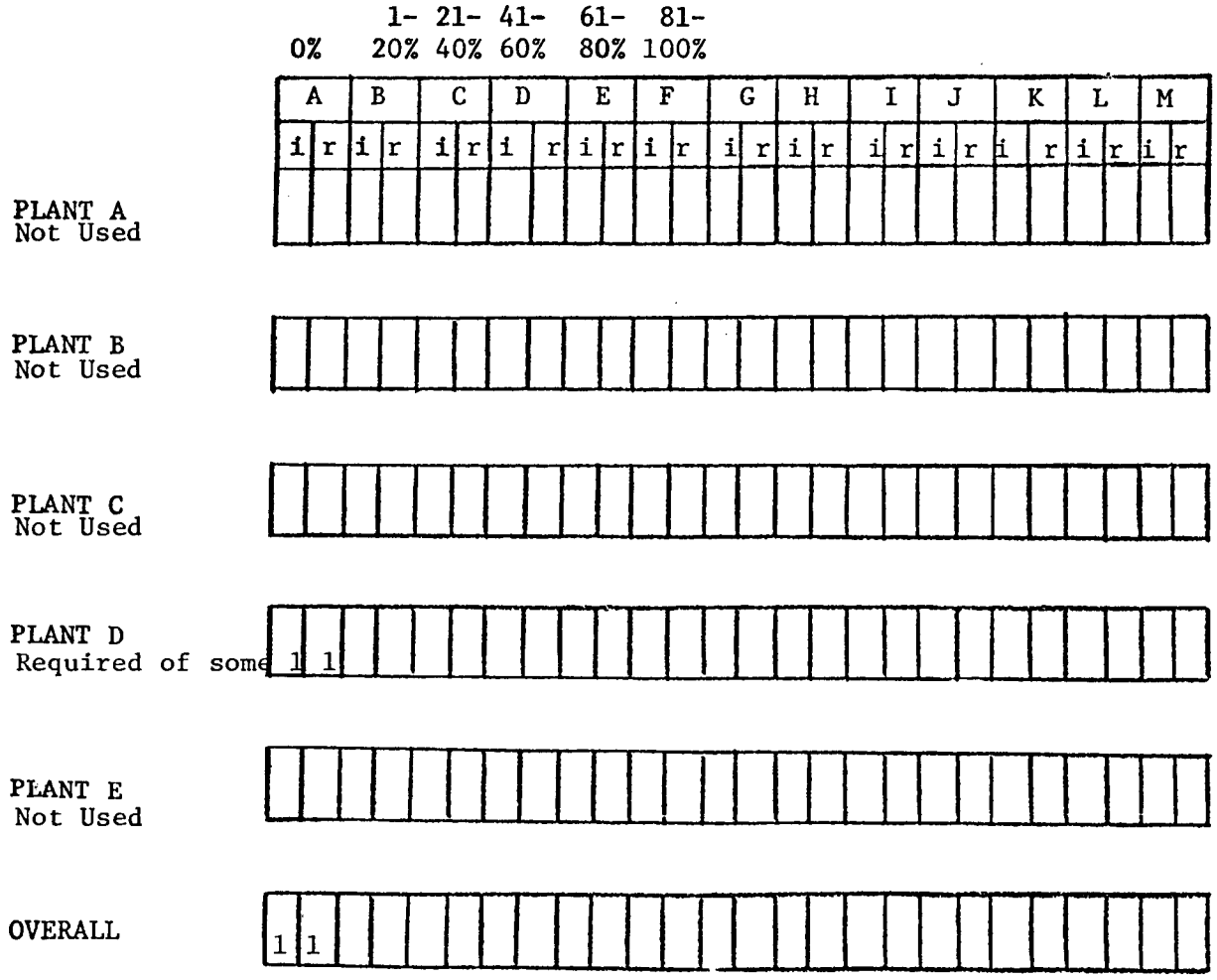


i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 41M

Code #_____

41M. Give percentage of OTHER initial and replacement cost paid for by the worker (100% means worker pays entire cost; 0% means plant pays entire cost)



i = % initial cost paid by worker
r = % replacement cost paid by worker

QUESTION NO. 42

Code #_____

42. Indicate devices marked in question 41 which are required to be used by all production workers in your plant. Also, indicate those devices which are required to be used by only some production workers. (Those devices not indicated are used on strictly a voluntary basis).

	A		B		C		D		E		F		G		H		I		J		K		L		M	
	a	s	a	s	a	s	a	s	a	s	a	s	a	s	a	s	a	s	a	s	a	s	a	s	a	s
PLANT A	1			1		1		1		1		1	1			1		1		1		1		1		
PLANT B							1							1												
PLANT C		1				1		1				1	1			1		1		1		1		1		
PLANT D	1			1		1		1				1	1			1		1		1		1		1		1
PLANT E	1			1		1		1				1	1			1		1		1		1		1		
OVERALL	3	1		3		4		5		1		4	4	1		4		4		4		4		4		1

a = required of all workers
s = required of some workers

OUESTION NO. 43

Code #_____

43. What disciplinary actions are taken against workers who do not use required protective devices?

a. Verbal reprimand
b. Written reprimand
c. Fines
d. "Demerits" which can be applied toward dismissal
e. "Demerits" which will hinder raises
f. "Demerits" leading to denial of rewards
g. Reassignment to a less desirable job
h. Other (specify)_____
i. None

ANSWERS TO QUESTION NO. 43

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1						1*					
PLANT B	1	1											
PLANT C	1	1											
PLANT D	1	1						1*					
PLANT E	1	1						1*					
OVERALL	5	5						3					

*Dismissal

*Dismissal

*Disciplinary layoff

QUESTION NO. 44

44. Which of those disciplinary actions marked in question 43 have you found most effective? Place a "1" after the most effective, a "2" after the second most effective, and a "3" after the third most effective.

ANSWERS TO QUESTION NO. 44

	a	b	c	d	e	f	g	h	i
Plant A	1	2						3*	

*Dismissal

	a	b	c	d	e	f	g	h	i
Plant B	1	2							

	a	b	c	d	e	f	g	h	i
Plant C	1	2							

	a	b	c	d	e	f	g	h	i
Plant D	1	2						3*	

*Dismissal

	a	b	c	d	e	f	g	h	i
Plant E	1	2						3*	

*Disciplinary layoff

OUESTION NO. 45

Code #_____

45. In general, is the condition of personal protective devices in your plant checked?

a. No

b. Ocasionally

c. At specified intervals

d. At worker's request

e. Other (specify)_____

ANSWERS TO QUESTION NO. 45

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A			1										
PLANT B		1											
PLANT C				1									
PLANT D					1*								
PLANT E					1*								
OVERALL		1	1	1	2								

*routinely by workers

*routinely by workers

OUESTION NO. 46

Code #_____

6. What disciplinary actions are imposed against workers who habitually fail to follow safe work practices or who are known risk-takers?

a. Verbal reprimand
b. Written reprimand
c. Transfer to less hazardous job
d. Fines
e. Required to participate in special safety training
f. Suspension
g. Dismissal
h. Other_____
i. None

ANSWERS TO QUESTION NO. 46

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1					1						
PLANT B	1	1					1						
PLANT C	1	1											
PLANT D	1	1					1	1*					
PLANT E	1	1			1	1	1						
OVERALL	5	5			1	1	4	1					

*we don't allow bad habits to develop

QUESTION NO. 47

47. Which of the disciplinary actions marked in question 46 have you found most effective? Place a "1" after the most effective, a "2" after the second most effective, and a "3" after the third most effective.

ANSWERS TO QUESTION NO. 47

	a	b	c	d	e	f	g	h	i
Plant A	1	2					3		
Plant B	1	2					3		
Plant C	1	2							
Plant D	2	3						1*	

*Don't allow bad habits to develop

Plant E	1	2				3			

QUESTION NO. 48

Code #_____

48. Is there a system established for workers in your plant to report suspected accident hazards?

a. Yes

b. No (If no, omit question 49)

ANSWERS TO QUESTION NO. 48

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5												

QUESTION NO. 49

Code #_____

49. In general, how does the worker report accident hazards?

a. In writing

b. By informing one's supervisor

c. By telling maintenance personnel

d. By telling safety personnel

e. Other (specify)_____

ANSWERS TO QUESTION NO. 49

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A		1											
PLANT B	1												
PLANT C		1		1									
PLANT D		1											
PLANT E		1											
OVERALL		4		1									

QUESTION NO. 50

Code #_____

50. Other than required forms, e.g., OSHA, Insurance Carriers, State Agencies, etc., does your plant use an additional accident recording form?

a. Yes (If more than one additional form is used, questions 51 and 52 refer to the one used most frequently)

b. No (Omit questions 51 and 52)

ANSWERS TO QUESTION NO. 50

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5	0											

QUESTION NO. 51

Code #_____

51. This accident recording form is unique:

a. To your industry

b. To your company

c. To your plant

d. Other (specify)_____

ANSWERS TO QUESTION NO. 51

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A			1										
PLANT B		1											
PLANT C			1										
PLANT D		1	1										
PLANT E		1											
OVERALL		3	3										

QUESTION NO. 52

Code #_____

52. This form gathers information on:

a. Major Injuries (those involving lost time or requiring medical treatment)

b. Minor Injuries (those not involving lost time or requiring medical treatment)

c. Near accidents

d. Other (specify)_____

ANSWERS TO QUESTION NO. 52

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1	1										
PLANT B	1	1											
PLANT C	1	1											
PLANT D		1	1	1									
PLANT E	1	1		1									
OVERALL	4	5	2	2									

QUESTION NO. 53

Code #_____

53. How often are accidents resulting in lost time investigated?

a. Always

b. Often

c. Occasionally

d. Never

ANSWERS TO QUESTION NO. 53

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5												

QUESTION NO. 54

Code #_____

54. How often are accidents resulting in minor injuries investigated? (those not involving lost time or requiring medical treatment)

a. Always

b. Often

c. Occasionally

d. Never

ANSWERS TO QUESTION NO. 54

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C				1									
PLANT D		1											
PLANT E	1												
OVERALL	3	1		1									

QUESTION NO. 55

Code #_____

55. How often are narrow escapes from accidents investigated?

a. Always

b. Often

c. Occasionally

d. Never

ANSWERS TO QUESTION NO. 55

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C		1											
PLANT D	1												
PLANT E		1											
OVERALL	3	2											

QUESTION NO. 56

Code #_____

56. If an investigation is made of an accident or narrow escape, how soon after the incident does the investigation usually take place:

LOST TIME ACCIDENT OR ACCIDENT REQUIRING MEDICAL TREATMENT

a. Within one day of the incident

b. Within three days of the incident

c. Within one week of the incident

d. Within two weeks of the incident

e. Within one month of the incident

f. Greater than one month after the incident

ANSWERS TO QUESTION NO. 56

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5												

QUESTION NO. 56A

Code #_____

56A. If an investigation is made of an accident or narrow escape, how soon after the incident does the investigation usually take place:

MINOR INJURY (INJURY NOT INVOLVING LOST TIME OR REQUIRING MEDICAL TREATMENT)

a. Within one day of the incident

b. Within three days of the incident

c. Within one week of the incident

d. Within two weeks of the incident

e. Within one month of the incident

f. Greater than one month after the incident

ANSWERS TO QUESTION NO. 56A

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B		1											
PLANT C	NO	RESPONSE											
PLANT D		1											
PLANT E		1											
OVERALL	1	3											

QUESTION NO. 56B

Code #_____

56B. If an investigation is made of an accident or a narrow escape, how soon after the incident does the investigation usually take place?

NARROW ESCAPE

a. Within one day of the incident

b. Within three days of the incident

c. Within one week of the incident

d. Within two weeks of the incident

e. Within one month of the incident

f. Greater than one month after the incident

ANSWERS TO QUESTION NO. 56B

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B		1											
PLANT C		1											
PLANT D	1												
PLANT E		1											
OVERALL	2	3											

QUESTION NO. 57

Code #_____

57. Who investigates accidents or near accidents?

a. Medical Personnel

b. Safety Personnel

c. Management Personnel

d. Union Officials

e. Worker representative(s)

f. Involved employee(s)

g. Worker supervisor(s)

h. Other (specify)_____

ANSWERS TO QUESTION NO. 57

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A		1	1		1	1	1						
PLANT B	1	1	1			1	1						
PLANT C	1	1											
PLANT D		1	1		1	1	1						
PLANT E	1	1	1		1	1	1	1					
OVERALL	3	5	4		3	4	4	1					

QUESTION NO. 58

Code #_____

58. Are the results of the investigation publicized within the plant, e.g., printed in plant newletters, posted on bulletin boards, etc.?

a. Yes

b. No (Omit question 59)

ANSWERS TO QUESTION NO. 58

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B		1											
PLANT C		1											
PLANT D	1												
PLANT E	1												
OVERALL	3	2											

QUESTION NO. 59

Code #_____

59. Who sees the results of the investigation?

a. Upper Management

b. Middle Management

c. Medical Personnel

d. Safety Personnel

e. Union Officials

f. Clerical Staff

g. Worker Supervisors

h. Workers

i. Other (specify)_____

ANSWERS TO QUESTION NO. 59

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1	1	1	1		1	1	1					
PLANT B	1	1	1	1			1						
PLANT C	1		1	1		1							
PLANT D	1	1	1	1		1	1	1	1				
PLANT E	1	1	1	1		1	1	1					
OVERALL	5	4	5	5		4	4	3	1				

QUESTION NO. 60

Code #_____

60. Are the accident statistics of your plant used as an index of when to make changes in your safety program?

a. Yes

b. No

ANSWERS TO QUESTION NO. 60

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5	0											

QUESTION NO. 61

Code #_____

61. Does your plant try to obtain accident experience data on other plants using similar industrial processes?

a. Yes

b. No (omit question 62)

ANSWERS TO QUESTION NO. 61

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C	1												
PLANT D	1												
PLANT E	1												
OVERALL	5	0											

QUESTION NO. 62

Code #_____

62. Do you use this information as an indicator of the effectiveness of your safety program?

a. Yes

b. No

ANSWERS TO QUESTION NO. 62

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A	1												
PLANT B	1												
PLANT C		1											
PLANT D	1												
PLANT E	1												
OVERALL	4	1											

QUESTION NO. 63

Code #_____

The following questions are being asked for statistical purposes only as is the request for information on plant accident experience. Please provide all available data.

63. What is the average number of production workers (non-office personnel) employed in your plant?

ANSWERS TO QUESTION NO. 63

	EMPLOYEES
PLANT A	2300
PLANT B	525
PLANT C	1400
PLANT D	580
PLANT E	900

QUESTION NO. 64

Code #_____

64. What is the average number of years spent with th plant by your production employees?

a. 1-3 years

b. 4-6 years

c. 7-9 years

d. 10-12 years

e. 13-15 years

f. 16 or more years

ANSWERS TO QUESTION NO. 64

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A				1									
PLANT B		1											
PLANT C			1										
PLANT D			1										
PLANT E				1									
OVERALL		1	2	2									

QUESTION NO. 65

Code #_____

65. What is the average age of your production workers?

a. 18-22 years

b. 23-27 years

c. 28-32 years

d. 33-37 years

e. 38-42 years

f. 43-47 years

g. 48 or more years

ANSWERS TO QUESTION NO. 65

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A			1										
PLANT B			1										
PLANT C			1										
PLANT D				1									
PLANT E					1								
OVERALL			3	1	1								

QUESTION NO. 66

Code #_____

66. What percent of the production workers in your plant are married?

a. 0-19%

b. 20-39%

c. 40-59%

d. 60-79%

e. 80% or more

ANSWERS TO QUESTION NO. 66

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A				1									
PLANT B					1								
PLANT C					1								
PLANT D				1									
PLANT E					1								
OVERALL				2	3								

QUESTION NO. 67

Code #_____

67. Which of the following choices best describes the educational level of the production workers in your plant?

a. 8th grade or less

b. Some high school or vocational school training

c. High school or vocational school graduates

d. Some college or technical school training

e. Two year college or technical school graduates

f. College graduates

ANSWERS TO QUESTION NO. 67

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A			1										
PLANT B		1											
PLANT C			1										
PLANT D			1										
PLANT E			1										
OVERALL		1	4										

QUESTION NO. 68

Code #_____

68. What is the average number of production workers under the direction of one first-line supervisor?

a. 1-5 workers

b. 6-10 workers

c. 11-15 workers

d. 16-20 workers

e. 21-25 workers

f. 26-30 workers

g. 31-35 workers

h. 36-40 workers

i. 41 or more workers

ANSWERS TO QUESTION NO. 68

	a	b	c	d	e	f	g	h	i	j	k	l	m
PLANT A				1									
PLANT B									1				
PLANT C									1				
PLANT D			1										
PLANT E		1											
OVERALL		1	1	1					2				

69. Please enclose with this questionnaire a copy of your completed OSHA Form 103 for 1973. Also, should you have recorded before 1971 your accident frequency rate in terms of number of disabling injuries for all employees per million-man hours of work in your plant, please indicate such rates for the following years:

1970_____

1969_____

70. If there are any answers to questions you would like to explain further or any particularly innovative ideas you would care to elaborate on, please use this page to do so.

71. Please indicate the position and/or title of the person who contributed most to the filling out of this questionnaire.

_____

_____

72. Please indicate by circling "yes" below if you would be receptive to a site-visit as described in the cover letter of this questionnaire.

a. Yes (If yes, in the spaces below give the name and business number of the person who should be contacted when arranging the visit.)

b. No

_____

_____

_____

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