"Safety sampling" technique

This technique is based on the random sampling application of probability theory which is used in production control As a result of applying the "safety sampling" technique to accident prevention, management is provided with a succinct statement of how safe a plant is operating, where trouble spots are (by areas and foremen), and the types and frequency of infractions

As indicated by the title, "safety sampling" requires that a statistical sample be determined The number of observations required to implement the "safety sampling" technique is based on a preliminary survey and the degree of accuracy desired In the preliminary survey, a member of the safety department should walk rapidly through the entire plant being studied and observe all employees *who are working* It is important in random sampling that only instantaneous impressions be recorded and that no attempt be made to correct an unsafe act during compiling time During this preliminary tour, two types of impressions are recorded (1) count each worker who is performing his task safely and (2) count each worker who is performing his task unsafely It is important that each unsafe operation be recorded, therefore, one worker's operations may be recorded several times Each unsafe task is categorized by type of infraction, thus the analysis also indicates the types and locations of unsafe operations

From these preliminary data, the percentage of unsafe operations is determined by dividing the number of unsafe operations by the total number of observations (both safe and unsafe) The percentage of unsafe operations (P) is then used in the formula

$$N = \frac{4(1-P)}{Y^2(P)}$$

to calculate the number of observations (N) required to obtain a desired accuracy (Y)

For example, assume a total of 200 observations of which 50 are unsafe observations, then $P = (50/200)(100) = 25\%$

The quantity Y is assigned a value of accuracy considered satisfactory by the safety department For most cases $Y = \pm 10$ per cent is sufficient Then by substitution into the formula

$$N = \frac{4(1-0.25)}{(0.10)^2(0.25)} = 1200 \text{ observations.}$$

What does 1200 observations mean? It means that a total of 1200 observations must be made if the safety sampling technique is to yield valid percentages of the types of unsafe practices and of how safe a plant is operating Hence, in this example, six tours of the plant are needed since each tour supplies about 200 observations (the nearness to this number depends on the number of employees working and how many unsafe acts each is performing at the instant the inspection is conducted)

Reports

In both small plants where overall observation is possible by those responsible for safety, and in large plants where a form of safety sampling is more practical, formal reports of the observations are necessary. These reports should be made on a form which is designed specifically for the organizational structure and work operations of each industry, plant, or operation Recording and reporting can be simplified by the use of forms similar to those shown in Figs 2-4 and 2-5

Written reports are prepared to point the way to necessary action, such as revision of company rules, training or retraining, changes in processes or operations, and improvement in supervisory practices Once designed, the report form can be used by safety group members, by supervisors, and by foremen for recording their observations Then the same form can be used as a summary sheet for a monthly, quarterly, or annual report to management

Inspection of Work Areas

Safety inspections are one of the principal means of locating accident causes They assist in determining what safeguarding is necessary to protect against hazards before accidents and personal injuries occur

As inspections of the manufacturing process are important functions in quality control, safety inspections are similarly of vital importance in accident control

Finding unsafe conditions by means of inspection and promptly correcting them is one of the best methods for management to demonstrate to employees its interest and sincerity in accident prevention Likewise,