# STATISTICS AND ANALYSIS

1. Accidents can be prevented by wisely analyzing hazardous occurrence data. This analysis assists commanders and managers to eliminate defects from their systems and thereby meet their safety responsibilities. Situations having serious consequences and a high probability of recurrence are generally easy to analyze, as the preventive measures are readily apparent. Individual reports of minor and frequent hazardous occurrences may seem to supply little preventive information. However, when collectively analysed useful information to eliminate future similar type occurrences is often revealed.

2. Analysis of the information recorded on hazardous occurrence reports transforms a series of unrelated facts into coherent data on circumstances, cause factors and trends. For instance, analysis of the circumstances of hazardous occurrences for repetitive factors and trends can:

a. identify and locate the possible sources of hazardous occurrences by determining the materiel, operations and resources involved;

b. determine the nature and size of the problem by section and occupation;

c. indicate the need and priority for changes to equipment, shop layout, procedures, training, job assignments, etc.; and

d. permit objective, rather than subjective evaluation of the safety program.

3. The HRMS H&S Module provides current, readily available data for statistical use. The number of injuries, days lost, the injuries and days lost per 100 personnel per year and the dollar loss for damages give an indication of an organization's ability to achieve its goals. In addition, this data helps pinpoint areas that require attention. As the information is general in nature, comparison between units should be done with caution due to the large variance in conditions. However, comparisons do help in establishing safety priorities.

4. Trends and Program effectiveness can be determined by the use of Injury Frequency Rate (IFR) and Injury Severity Rate (ISR) for quarterly and annual periods. In addition the Modified Duty Rate (MDR) and the Light Duty Rate (LDR) are a ways of measuring the effectiveness of the organization's Return to Work Program. These four rates are useful Performance Measurement tools.

5. **Injury Frequency Rate (IFR).** The number of disabling and non-disabling injuries per 100 DND/CF personnel per year or quarter for any command, base, station, unit, etc. In order to allow for quarterly or annual calculations, the formula assumes a work year to be 2000 hours (this is a recognized Canadian and US standard used in the safety field). This is multiplied by 100 people to become 200 000 and is divided by the total number of hours worked. Most organizations will not be able to determine the total number of hours worked without great difficulty therefore an approximate value can be used which is the average number of personnel multiplied by the Time Factor (500 for each quarter and 2000 for the year).

6. **Injury Severity Rate (ISR).** The number of days off duty plus the number of days on "light duties or modified duties" per 100 DND/CF personnel per year or quarter for any command, base, station, unit, etc.

7. **Modified Duty Rate (MDR).** The number of days on modified duties per 100 DND civilian employees per year.

8. **Light Duty Rate (LDR).** The number of days on modified duties per 100 CF members per year.

9. **IFR/ ISR Equations.**

IFR = Disabling and non-disabling injuries per 100 personnel/time period (annual or quarterly)

A = No. of disabling injuries

B = No. of non-disabling injuries

C = Average number of personnel in the unit for the period multiplied by the total number of hours worked or the Time Factor

$$\mathbf{IFR = \frac{(A+B)\ x\ 200000}{C}}$$

ISR = Days off duty or days on light duty per 100 personnel/time period (annual or quarterly)

A = No. of days light duty

B = No. of days off duty

C = Average number of personnel in the unit for the period multiplied by the total number of hours worked or the Time Factor

$$\mathbf{ISR = \frac{(A+B)\ x\ 200000}{C}}$$

**NOTE**

In the event of a fatality, the number of days lost is counted as three years (600 days) for full time personnel.

**QUERY TOOL**

10. Even after methodical investigation and careful review of hazardous occurrences, there is still another means to obtain more information. By analyzing certain data, trends can be seen and problems unmasked. It can show, for instance, that large number of incidents involve the use of certain materiel or equipment, involve people with certain levels of experience, or occur at certain times of the work day.

11. More detailed information may be obtained by tabulating the data collected by the HRMS H&S Module. The data can be extracted as an Excel spreadsheet and manipulated to produce meaningful charts. This can be accomplished using the Query Tool in HRMS. By simple counting of like data elements, questions may be answered. For example, age versus the number of hazardous occurrences could be charted to determine which age group has the most hazardous occurrences. Also, locations may be compared with the type of hazardous occurrence to determine where and what hazards exist. GSOs should review their data on a regular basis to determine trends and problem areas that require special attention.

(Pages 4AI-1 and 4AI-2 inclusive are deleted by this change)