



QUORUM
MINING & RELINING
SERVICES

HEALTH AND SAFETY MANAGEMENT

RISK MANAGEMENT MANUAL

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Hazard & Risk Assessment Manual

Hazard Assessment & Job Safety Analysis

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Hazard and Risk Assessment Manual

1. Introduction & Purpose

1.1. QUORUM is committed to ensuring a safe and healthy workplace. In order for this to occur, hazards must be controlled. The first step in controlling hazards is identification and risk assessment. This manual provides guidelines on risk assessment and conducting a job hazard analysis.

2. Scope/Application

2.1. This manual applies to all QUORUM employees and to all areas where QUORUM employees work.

Definitions

- ⊙ **Exposure Assessment** - The qualitative and/or quantitative evaluation of the likely intake of biological, chemical, and physical agents via food as well as exposures from other sources if relevant.
- ⊙ **Hazard** - A biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect.
- ⊙ **Hazard Characterization** - Qualitative and/or quantitative evaluation of nature of adverse health effects associated with the hazard. For the purpose of microbiological risk assessment the concerns relate to microorganisms and/or their toxins.
- ⊙ **Hazard Identification** - The identification of biological, chemical, and physical agents capable of causing adverse health effects and which may be present in a particular food or group of foods.
- ⊙ **Quantitative Risk Assessment** - A risk assessment that provides numerical expressions of risk and indication of the attendant uncertainties (stated in the 1995 Expert Consultation definition on Risk Analysis).
- ⊙ **Qualitative Risk Assessment** - A risk assessment based on data which, while forming an inadequate basis for numerical risk estimations, nonetheless, when conditioned by prior expert knowledge and identification of attendant uncertainties permits risk ranking or separation into descriptive categories of risk.
- ⊙ **Risk** - A function of the probability of an adverse health effect and the severity of that effect, consequential to a hazard(s) in food.
- ⊙ **Risk Analysis** - A process consisting of three components: Risk assessment, risk management and risk communication.
- ⊙ **Risk Assessment** - A scientifically based process consisting of the following steps: (i) hazard identification, (ii) hazard characterization, (iii) exposure assessment, and (iv) risk characterization.
- ⊙ **Risk Characterization** - The process of determining the qualitative and/or quantitative estimation, including attendant uncertainties, of the probability of occurrence and severity of known or potential adverse health effects in a given population based on hazard identification, hazard characterization and exposure assessment.



- ⊙ **Risk Communication** - The interactive exchange of information and opinions concerning risk and risk management among risk assessors, risk managers, consumers and other interested parties.
- ⊙ **Risk Estimate** - Output of risk characterization.
- ⊙ **Risk Management** - The process of weighing policy alternatives in the light of the results of risk assessment and, if required, selecting and implementing appropriate control options, including regulatory measures.
- ⊙ **Sensitivity analysis** - A method used to examine the behavior of a model by measuring the variation in its outputs resulting from changes to its inputs.
- ⊙ **Transparent** - Characteristics of a process where the rationale, the logic of development, constraints, assumptions, value judgments, decisions, limitations and uncertainties of the expressed determination are fully and systematically stated, documented, and accessible for review.
- ⊙ **Uncertainty analysis** - A method used to estimate the uncertainty associated with model inputs, assumptions and structure/form.

3. Responsibilities

- 3.1. The Safety Manager is responsible for the overall management of risk assessment and job hazard analysis within QUORUM.
- 3.2. Department/Regional Managers are responsible for working with the Safety Manager to select areas to conduct a risk assessment and job hazard analysis, and to provide adequate resources to ensure assessments and analysis can be completed effectively.

4. Implementation

Work Environment Monitoring

- 4.1.1. **Definition:** *Work Environment monitoring in the context of QUORUM's occupational health and management system refers to "those activities involving observation, testing and monitoring of the work environment in order to detect and assess if there are hazards present, to which employees and others may be exposed which have a potential to cause occupational health problems to those present in the workplace."*
- 4.1.2. Work environment monitoring could include, but is not limited to, activities for monitoring for the presence of :
 - Hazardous Substances
 - Noise
 - Fumes or Vapors
 - Radiation
 - Ergonomic Hazards
 - Fall Hazards
- 4.1.3. Air monitoring may be required as part of the risk assessment (where it is necessary to obtain a quantitative estimate of exposure), or to determine the effectiveness of engineering controls.



4.1.4. See the Respiratory Protection Policy and the QUORUM Respiratory Protection Manual for details on work environment monitoring.

How to Conduct a Job Hazard Analysis

4.1.5. **Job Hazard Analysis**

4.1.6. Job Hazard Analysis is a procedure used to review work methods and uncover hazards that may result in accidents. It is one of the first steps in hazard prevention and safety training because a hazard must be recognized before it can be eliminated. Performance of a Job Hazard Analysis also assists in the determination of the cause(s) of an accident. The Job Hazard Analysis must be performed:

- On all accidents causing death or major injuries
- On tasks or procedures which field management or the QUORUM Safety Manager believe may pose uncontrolled hazards
- On tasks or procedures that have a history of resulting in personal injury or property damage and
- When new machines and potentially hazardous materials which can cause injury are introduced.

4.2. **Uses of the Job Hazard Analysis**

4.2.1. The Job Hazard Analysis provides a learning opportunity for the supervisor/manager and employee. Copies of the Job Hazard Analysis should be made available to all employees who perform that job. The supervisor should explain the analysis to the employees and if necessary, provide additional training.

4.2.2. New employees or employees asked to perform new tasks must be trained to use the safe and efficient procedures developed in the Job Hazard Analysis. The new employee should be taught the correct method to perform a task before dangerous habits develop. The employee should also be instructed on how to recognize the hazards associated with each job step and to use the necessary precautions to avoid injury or accidents.

4.2.3. Jobs that are performed infrequently require additional effort to minimize accident potential. Pre-job instruction addressing the points listed on the Job Hazard Analysis will serve as a refresher to employees who may have forgotten some of the hazards in performing the task and the proper procedure to be used to avoid these hazards.

4.2.4. Finally, the Job Hazard Analysis is an accident investigation tool. When accidents occur involving a job for which a Job Hazard Analysis has been performed, the analysis should be reviewed to determine if proper procedures were followed or if the procedures should be revised.

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5. Additional Information or Process Details/Steps

Job Hazard Analysis Procedure

5.1.1. Supervisors are expected to perform Job Hazard Analysis to evaluate jobs and work methods and to eliminate hazards. Before conducting a Job Hazard Analysis.

Step 1: Select the Job

In selecting jobs to be analyzed and in establishing the order of analysis, the following factors should be considered. They are listed in order of importance.

1. **Production of Injuries.** Every job that has produced a medical treatment or disabling injury during the past three years should be analyzed.
2. **Frequency of Accidents.** Jobs that repeatedly produce accidents are candidates for a Job Hazard Analysis. The greater number of accidents associated with the job, the greater its priority for a Job Hazard Analysis. Subsequent injuries indicate that preventive action taken prior to their occurrence was not successful.
3. **Potential Severity.** Some jobs may not have a history of accidents but may have the potential for severe injury or property damage. The greater the potential severity, the greater its priority for a Job Hazard Analysis.
4. **New Jobs.** New operations created by changes in equipment, potentially hazardous materials or processes obviously have no history of accidents, but their accident potential should be fully appreciated. A Job Hazard Analysis should be made on every new job created. Analysis should not be delayed until an accident or "near miss" occurs.

Step 2: Perform the Analysis

The supervisor responsible for the task should perform the JHA using the Job Hazard Analysis Work Sheet. This worksheet should be used as a reference as the notes taken on it can be used when determining hazards and recommendations. A reliable list will be developed through observation and discussion. The supervisor should conduct the JHA with the assistance of employees who regularly perform the task.

The job being analyzed should be broken down into a sequence of steps that describes the process in detail. Avoid two common errors: 1) making the breakdown too detailed so that an unnecessarily large number of steps results or 2) making the job breakdown too general so that the basic steps are not distinguishable. As a rule, the Job Hazard Analysis should contain less than 12 steps. If more steps are needed, the job should be broken into separate tasks. Job Hazard Analysis involves the following:

1. Selecting a qualified person to perform the task.
2. Briefing the employee demonstrating the task on the purpose of the analysis.
3. Observing the performance of the job and breaking it into basic steps.



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4. Recording and describing each step in the breakdown.
5. Reviewing the breakdown and description with the person who performed the task.

Select an experienced, capable and cooperative person who is willing to share ideas. He/She should be familiar with the purpose and method of a Job Hazard Analysis. Sometimes it is difficult for someone who is intimately familiar with a job to describe it in detail, therefore, reviewing a completed Job Hazard Analysis before conducting one will help illustrate the terminology and procedure to be followed.

Review the breakdown and analysis with the person who performed the job to ensure agreement of the sequence and description of the steps. Variations of routine procedures should be analyzed also.

The wording for each step should begin with an action word such as "remove," "open, or" "lift".

Step 3: Identify Hazards

Hazards associated with each step are identified. To ensure a thorough analysis, answer the following questions about each step of the operation:

1. Is there a danger of striking against, being struck by, or otherwise making injurious contact with an object?
2. Can the employee be caught in, by, or between the objects?
3. Is there a potential for a slip or trip? Can someone fall on the same level or to another?
4. Can an employee strain himself or herself by pulling, pushing, lifting, bending or twisting?
5. Is the environment hazardous to one's health (toxic gas, vapor, mist, fumes, dust, heat, chemicals or radiation)?

Step 4: Develop Solutions

The final step in Job Hazard Analysis is to develop a safe, efficient job procedure to prevent accidents. The principal solutions for minimizing hazards that are identified in the analysis are as follows:

1. **Find a new way to do a job.** To find an entirely new way to perform a task, determine the goal of the operation and analyze the various ways of reaching this goal. Select the safest method. Consider work saving tools and equipment.
2. **Change the physical conditions that create the hazard.** If a new way to perform the job cannot be developed, change the physical condition (such as tools, materials, equipment, layout, location) to eliminate or control the hazard.
3. **Reduce the frequency of its performance.** Often a repair or service job has to be repeated frequently because of another condition that needs correction. This



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is particularly true in maintenance and material handling. To reduce the frequency of a repetitive job, eliminate the condition or practice that results in excessive repairs or service. If the condition cannot be eliminated, attempt to minimize the effect of the condition. Reducing the number of times a job is performed contributes to safer operations only because the frequency of exposure to the hazard is reduced. It is, of course, preferable to eliminate hazards and prevent exposure by changing physical conditions or revising the job procedure or both.

In developing solutions, general precautions such as “be alert”, “use caution,” or “be careful” are useless. Solutions should precisely state what to do and how to do it. For example, “make certain the wrench does not slip or cause loss of balance” does not tell how to prevent the wrench from slipping. A good recommendation explains both “what” and “how.” For example, “Set wrench jaws securely on the bolt. Test its grip by exerting slight pressure on it.”

Step 5: Conduct a Follow-up Analysis

No less than once per month, each supervisor should observe employees as they perform at least one job for which a Job Hazard Analysis has been developed. The purpose of these observations is to determine whether or not the employees are doing the jobs in accordance with the safety procedures developed. The supervisor should review the Job Hazard Analysis before doing the follow-up review to reinforce the proper procedures that are to be followed.

6. Record Keeping

6.1. A directory of Job Hazard Analysis’s is maintained on the [Company Name]Web and is readily accessible to employees.

7. Review and Evaluation

- 7.1. Follow-up analysis is conducted per Step 5 above.
- 7.2. A Job Hazard Analysis should be reviewed annually and anytime there is a modification to the equipment or a change to a procedure.



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