

CRSP

Examination Preparation Study Manual

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Who Should Investigate?

As with any problem-solving exercise, the people with the most interest in the problem are the obvious first choice. The first choice for investigating accidents or incidents is the first line supervisor. There are many reasons:

- They have a personal interest.
- They know the people and conditions.
- They know best, how and where, to get the information.
- They will start or take the action.
- They benefit from investigating.
 - shows concern
 - increases productivity
 - reduces operating costs
 - shows that supervisors have control.

Sometimes, middle or higher managers should do the investigation when:

- there is a major loss or high potential incident
- the circumstances cross into another supervisor's area
- the corrective actions have a broad scope or significant costs.

Occasionally, special knowledge is needed in an investigation. In these situations, technical experts should be brought into the investigation as advisors. Safety personnel are included here.

Steps in an Investigation

1. Respond to the incident promptly.
2. Gather information.
3. Analyse and evaluate causes.
4. Develop and take remedial action.
5. Review findings and recommendations.
6. Follow through.

We will look at Steps 2 and 3 in a little more detail.

Gather Information

Ask yourself some fundamental questions to determine what information needs to be gathered: What? Who? etc.

- Sketch and map site.
- Take photographs/video.
- Interview witnesses.
- Examine materials and equipment.
- Examine records.

Analyse and Evaluate Causes

There are a number of ways to analyse and evaluate the causes of an incident. One way is to apply an incident causation model or accident theory. In many models there are two types of

causes; the immediate causes which are really the hazards (the unsafe conditions/practices) that existed at the time of the incident and the underlying or root causes that contributed to the existence of those immediate causes.

Several sophisticated techniques have been developed to assist with root cause analysis such as TapRoot, Apollo or SCAT (described below), but simpler techniques such as The Five Whys Technique can be used effectively. The Five Whys Technique was developed by the Toyota Motor Co. in the early 1970s. The premise of this technique is to find root causes by repeatedly asking the question why. Begin by asking "Why did this hazard exist?" When the answer is found, ask "Why is this the case?" and continue asking why questions at least five times. Five is not a magic number; it may be necessary to continue questioning why until the root cause is discovered or until no more information is available.

CSA has developed a useful standard in this area: CAN/CSA-Z796-98 (R2008) "Accident Information".

Systematic Cause Analysis Technique (SCAT)

SCAT is a problem-solving tool based on the DNV Management Systems loss causation model. It is recommended for those accidents or incidents resulting in major loss or with the potential for major loss. It helps to systematically link losses, contacts and immediate causes to the underlying basic causes and appropriate control action needs.

Management Oversight and Risk Tree (MORT)

MORT is a derivative of system safety and fault tree analysis techniques. It is both a program and a logic diagram. The MORT diagram is a pre-designed tree consisting of three branches:

1. Specific control oversights and omissions.
2. Management system oversights and omissions.
3. Assumed-risks.

The MORT tree generally describes all phases of a safety program and it is of particular value in incident investigations. It can also be used as an evaluation tool to discover safety system/program weaknesses or errors.

Strengths:

- Easy to apply
- Useful in large-scale investigations.

Weaknesses:

- Tedious
- Time consuming

HSM18 – Surveys, Surveillance and Assessments

HSM18 Demonstrate an understanding of surveys, surveillance and assessments (e.g., health, culture/climate, etc.)

Audits and surveys can be affected by the companies' culture or climate. The management level of involvement in an audit can be correlated to their involvement in the health and safety program. In companies with little to no engagement in the health and safety program, it can be difficult to attain an interview with upper management personnel. When interviews do take place, management often demonstrates a lack of knowledge or a lack of their participation in the program.

The company culture can also be demonstrated by the direction given to an auditor. If management tries to control the audit process too closely, such as restricting the scope of the audit, who can be interviewed and what documents can be reviewed, then the auditor must still follow the requirements of the audit and not be influenced by these situations. This can show up in interviews where employees will sometimes complain and unions may speak for their members who may be hesitant to speak to auditors. Conversely in companies that have high participation rates in the health and safety program with employees, an auditor will see good participation from employees in the audit process with open interviews.

When the audit report is completed and is in a style consistent with the company culture, they are most likely to have the recommendations implemented whereas if the recommendations do not fit the companies' culture, they are most likely to be ignored.

Depending on the circumstances at the workplace, health surveillance and assessments may have to take place. Employees who are exposed to certain chemicals or biological agents may need to see occupational physicians or nurses and be placed on a monitoring or surveillance program. (e.g. worker unknowingly exposed to mercury; medical assessment shows mercury in their hair; medical surveillance is performed over time if mercury levels in their hair are shown to be positive; survey the worker until it has been excreted from the body).

Health surveys can also be performed in conjunction with the company wellness program to determine what types of programs can be offered to the workers dependant on the survey results. An example is blood pressure clinics (performed by nurses) and dependant on the results, to guide workers to their personal physician for follow-up as necessary.

HSM19 – Auditing

HSM19 Demonstrate an understanding of auditing (e.g., hazard audits, compliance audits, OHSMS audits, protocols and procedures, relevant standards, etc.)

Introduction to HSE Auditing

An audit is a review and evaluation of a system or process. The most common type of audit for most organizations is the financial audit, but many other organizational systems or processes are

Atmospheric Pressure

Atmospheric pressure may be either greater than normal - high pressure, or less than normal – low pressure. With high pressure work, such as under water diving operations and caisson/tunnelling work, oxygen narcosis and decompression sickness (the bends) are problems requiring special mixtures of gases for breathing and careful monitoring of the return to normal pressure. At high altitudes, lack of oxygen (hypoxia) can lead to reduced performance, confusion, dizziness, and blackouts. Also, at high altitudes some contaminants such as carbon monoxide have a greater effect.

Pressure Hazards

Canada has adopted the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessels Code: CSA B51-09 "Boiler, Pressure Vessel and Pressure Piping Code".

Boilers

These are defined in the code as fired, closed vessels in which water is heated by combustion of fuel or heat from other sources. The heat forms steam, hot water or high-temperature water (HTW) under pressure. Safety valves are installed on boilers to relieve excess pressure or vacuum. Fusible plugs are designed to relieve excess pressure and indicate conditions that contribute to low water. Potential safety hazards associated with boilers and other pressurized vessels include the following:

- Design, construction, or installation errors
- Poor or Insufficient training of operators
- Human error
- Mechanical breakdown or failure
- Failure or blockage of control or safety devices
- Insufficient or improper inspections
- Improper application of equipment
- Insufficient preventive maintenance

Through years of experience, a great deal has been learned about how to prevent accidents associated with boilers. Always ensure that the equipment manufacturer's specifications and maintenance schedules are followed.

High-temperature water (HTW) is water kept in a closed system under high pressure so that it remains in liquid form rather than steam.

Unfired Pressure Vessels

These are defined in the code as unfired, closed vessels used for containing, storing, distributing, transferring distilling, processing or otherwise handling gas, vapour, or liquid exceeding the service and size limits determined by the regulatory body having jurisdiction.

Included are compressed air tanks, steam-jacketed kettles and other vessels storing gases under pressure, including fire extinguishers.

3. The external environment: government regulations, norms and values of society, ethical climate of industry.

Maintaining High Ethical Standards

It is appropriate for organizations to examine ways of maintaining high ethical standards in management:

1. Ethics training
2. Whistleblower protection
3. Top management support
4. Formal codes of ethics
5. Strong ethical cultures

Corporate Social Responsibility

- Corporate social responsibility is an obligation of the organization to act in ways that serve both its interests and the interests of its many external publics, often called stakeholders.
- Criteria for evaluating corporate social performance include economic, legal, ethical and discretionary responsibilities.

EPRF2 – Obligations of a CRSP

EPRF2 Demonstrate an understanding of the obligations of a CRSP (e.g., with respect to employers, co-workers, public, fellow professionals, contractors, etc.)

As per the CRSP's Code of Ethics the general obligations and duties are well established.

The ethical relationships of CRSPs are defined in order to ensure that their conduct will:

- a) Provide sound judgement in pursuance of their professional duties;
- b) Maintain the highest standards of integrity and professional competence; and,
- c) Uphold the honour and prestige of the profession.

Practicing CRSPs have several obligations to others. These obligations fall into three major categories:

1. Employers and co-workers

When employed by an employer to provide advice and assistance in our professional practice there is an expectation that we will provide services to our employer that are: legal, to the best of our abilities and only in areas of our expertise.

Under Canadian OH&S legislation the concept of being “our brothers and sisters keeper” is well established. We are all responsible to the people at our workplaces to ensure not only our own safety but the other people present and the workplace. As a safety professional your knowledge of OH&S issues is superior to other non-safety

professionals. In this case your knowledge of hazards and their mitigation would place a high standard of care for you to exercise in warning and providing solutions to health and safety related issues.

2. The Public at large

Common Law principles and practices dictate that the practicing CRSP has a legal and moral obligation to carry out their duties as per the BCRSP Code of Ethics.

3. Fellow Professionals

“The BCRSP Code of Ethics specifically obligates the CRSP to their fellow professionals. Specifically:

- Recognize and respect the original work, integrity and ability of their peers.”
 - For example, as per the copyright notice contained at the beginning of this Study Manual, and the Workbook, copying of either of these items is a violation of the BCRSP’s Code of Ethics.

“Not use the certification in such a manner as to bring the certification body into disrepute, and not make any statement regarding the certification which the certification body may consider misleading or unauthorized.”

Employers and the public holding CRSPs in high regard needs to be established and maintained by all CRSPs. It is our obligation to our fellow professionals to practice in a manner that will enhance the reputation of our fellow professionals.

Conflict of Interest

Mentioned earlier under the heading “What is Ethical Conduct”, a conflict of interest was defined as a clash between the private interests of the individual and his or her professional responsibilities. Many examples can be brought to mind, for example the method in which a person chooses to (or chooses not to) present known problems or issues to the organization with which one is employed. A related example might be the presentation of findings of an audit or incident investigation which are likely to be received negatively by senior company officials.

The BCRSP Code of Ethics and the earlier materials under “Professional Ethics” and “Managerial Ethics” are intended to help the CRSP in both identifying issues that represent potential conflict of interest and in applying various professional practices and moral theories to evaluate and resolve such situations. In cases where a person cannot resolve such conflict they may be required to withdraw from situations or activities with which they cannot fulfil their professional obligations and duties.

Recommended reading:

OHS BoK – Search:

The Human Principles of Social Interaction

The Human: As a Biological System

The Human: Basic Psychological Principles

THSS7 – Understanding of Human Psychology Principles

THSS7 Demonstrate an understanding of human psychology principles (e.g., organisational and industrial psychology, behavioural psychology, neuropsychology, psychomotor, motivation, personality, cognitive psychology, etc.)

Psychology has been defined as the scientific study of behaviour and mental processes (the science of mind and behaviour).

In the OHS field, psychological hazards are becoming as important as physical hazards. While psychological hazards are not always tangible, they have an effect on the body and thus an effect on behaviour.

Personality Psychology – is the organization within a worker of those psychophysical systems that make up their characteristic behaviour and thoughts.

Learning Process – (cognitive psychology) – in order to understand motivation, attitudes, emotions and individual differences you must take into account the learning process involved in each workers outlook and personality. Worker memory, attention and decision making can affect work performance and safety including interaction with systems and machinery. Cognitive biases can also affect problem solving and decision making in the work process and are relevant to the workers perception of risk.

Neuropsychology – has been defined as how the brain and the rest of the nervous system influence a person's cognition and behaviors. More importantly, professionals in this branch of psychology often focus on how injuries or illnesses of the brain affect cognitive functions and behaviors. After a workplace incident, this type of assessment can be used to understand the relationship of the event at work to the worker's mental status, to identify mental health conditions, and to assist with claim management and clinical decision making. The assessments may also help determine whether a psychological functional impairment exists.

Psychomotor Psychology – these are the primary movement tasks that lead an individual to learn about their environment (e.g. how a child learns to walk). There are 3 stages

- Cognitive – is characterized by awkward movement
- Associative – movements are more automatic for individuals but not yet permanent
- Refinement – through practice at the associative stage

3. Develop premises regarding future conditions: Consider external factors that may help or hinder goal accomplishment and forecast future trends.
4. Identify and choose among alternative courses of action: List and evaluate alternatives. Choose one or more and prepare an action plan.
5. Implement the action plan and evaluate results.

Different Planning Approaches

Inside-out: Focus is on what you are already doing. Used when you want to do what you are doing, but you want to do it better. The planning objective is how to do it better.

Outside-in: Used when you want to find a unique niche and do something no one else is doing. The planning objective here is to find the available niches and select those you can best exploit.

Top-down: Top management sets broad objectives and allows lower management levels to make plans within general directions.

Bottom-up: Plans are developed at lower levels without constraints and passed up to top management.

Contingency planning: Involves identifying alternative courses of action that can be taken if and when an original plan becomes inappropriate due to changing circumstances.

Forecasting

All good plans involve forecasts. Typical forecasts include those of economic conditions, interest rates, unemployment rates, trade deficits, etc.

Qualitative forecasting uses expert opinion to predict future. A single person or groups of experts may be consulted.

Quantitative forecasting uses mathematical and statistical analysis of data banks to predict future events.

Making Plans Effective

Planning has its limits and it can fail because of poor information, lack of support, unforeseen events, etc. Informed managers who truly understand the planning process and implement it well can avoid such planning pitfalls. Important considerations in this regard are:

Participative planning, which actively includes as many of the people who will be affected by the plan and/or who will be asked to help implement it.

Benchmarking is the use of external comparisons; of what is taking place in other organizations to gain added perspective on the company's current performance and to help identify future possibilities.