BLUEPRINT FOR THE CANADIAN REGISTERED SAFETY PROFESSIONAL EXAMINATION (CRSPEX)

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PREFACE

The Board of Canadian Registered Safety Professionals (BCRSP) is pleased to present the *Blueprint for the Canadian Registered Safety Professional Examination* (CRSPEX). Administration of the first examination developed from the new Blueprint is targeted for February 2015.

The Blueprint was developed to guide those involved in the development of the *Canadian Registered Safety Professional Examination* and to provide the public (e.g., examinees, educators, administrators) with practical information about the examination.

The Blueprint has two major components: (1) the content domain to be measured and, (2) the explicit guidelines on how this content is to be measured. The content domain consists of the CRSPEX set of competencies (i.e., the competencies expected of entry-level registered safety professionals), and the guidelines are expressed as structural and contextual variables. The Blueprint also includes: a *Summary Chart* (p.11) that summarizes the examination guidelines; a *Glossary* (p. 12) that provides definitions of terms appearing in bold throughout the document.

BCRSP wishes to thank all the individuals who have contributed to the creation of this Blueprint. In particular, thanks are extended to registered safety professionals across Canada who responded to the competency validation survey.

A comprehensive review of this first edition of the *Blueprint for the Canadian Registered Safety Professional Examination* is planned for 2018. In addition, the Blueprint will be evaluated annually to reaffirm that the competencies and the guidelines for examination development continue to reflect what is expected of an entry-level registered safety professional beginning to practice.

BCRSP encourages all users of this document to provide feedback which may be useful in future revisions of the Blueprint. Please forward all such comments to:

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INTRODUCTION

The Board Canadian Registered Safety Professionals develops the Canadian Registered Safety Professional Examination (subsequently referred to as the CRSPEX) for registering purposes. It fulfills this service by working in collaboration with Canadian Registered Safety Professionals (CRSP's) from across Canada who serve as the content experts in developing and validating the examinations.

Registration/licensure/certification examinations have a well-defined purpose: to protect the public by ensuring that those who are licensed possess sufficient knowledge and skills to perform important occupational activities safely and effectively (Canadian Psychological Association, 1987). In the case of the CRSPEX, the purpose is to determine whether or not examinees are prepared to practice occupational health and safety, without risk to the public and to the environment.

The purpose of this Blueprint is to describe how the examination is to be developed.

The primary function of the Blueprint for the Canadian Registered Safety Professional Examination is to describe how the examination is to be developed. Specifically, this Blueprint provides explicit instructions and guidelines on how the **competencies**[1] (e.g., knowledge, abilities, skills, attitudes, and judgment) are to be expressed within the examination in order for accurate decisions to be made on the ability of examinees to practice safely and effectively.

Prior to producing this Blueprint, BCRSP undertook an extensive study to identify the competencies required for the safe and effective practice of registered safety professionals in Canada. Individual registered safety professionals from across the country were active participants in all phases of the investigation, which served to identify and validate a comprehensive set of 113 competencies expected of the registered safety professional. With this set of competencies, and the validation data obtained, the essential components of the CRSPEX could be clearly described.

The periodic and comprehensive review of the competencies measured by the CRSPEX assists the BCRSP in maintaining the validity of the CRSPEX, and to develop psychometrically sound and legally defensible registration examinations. Because of changes that occur in the practice of health and safety professionals, a validation study of the competencies is conducted at least every five years, or as needed. In addition to the periodic

comprehensive review and validation study, the competencies are reviewed and evaluated annually by content experts.

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[1] The terms appearing in bold are defined in the Glossary.

TECHNICAL SPECIFICATIONS

The following section presents the technical specifications that are to guide the development of the CRSPEX. In the first part, issues related to the competencies are addressed. The second part describes the guidelines to be followed in addressing the structural and contextual variables of the CRSPEX.

The CRSPEX is a **criterion-referenced examination**. That is, a fundamental component of the development of the CRSPEX is a comprehensive description of the content domain being measured. In the case of the CRSPEX, the content domain of interest consists of the competencies a registered safety professional is required to possess in order to practice safely and effectively. These competencies form the basis of the CRSPEX.

This section describes the competencies that were obtained as a result of the validation process, the way they have been grouped, and the manner in which they are to be sampled in the examination development process.

DEVELOPING THE SET OF COMPETENCIES

The competencies were evaluated by approximately 1350 Canadian Registered Safety Professionals.

As a starting point for developing a set of competencies, a Committee on Competencies was formed that was representative of all areas of practice of registered safety professionals in Canada. This committee reviewed various competency lists prepared for health and safety professionals. Using the competency lists, the committee developed a preliminary national set of competencies, and a nine-category classification to group these competencies. The competencies in this initial set were then evaluated by a sample of approximately 1350 Canadian Registered Safety Professionals (CRSP's), including practitioners, educators, and administrators, who were asked to rate each competency in terms of its applicability, importance and frequency for the registered safety professional. The Committee on Competencies reviewed the results of the survey. The CRSPEX Set of Competencies has the primary purpose of providing the content domain for the examination.

COMPETENCY CATEGORIES

The initial classification of the competencies consisted of the following nine categories defined below (the number and the percentage of competencies are indicated in parentheses following the category name):

1. Applied Safety Fundamentals (25 competencies or 22% of the set of competencies)
2. Auditing (9 competencies or 8% of the set of competencies)
3. Ergonomics (9 competencies or 8% of the set of competencies)
4. Fire Prevention and Protection (8 competencies or 7% of the set of competencies)
5. Health and Wellness (11 competencies or 10% of the set of competencies)
6. Law and Ethics (11 competencies or 10% of the set of competencies)
7. Management Systems (17 competencies or 15% of the set of competencies)
8. Occupational Hygiene (13 competencies or 11% of the set of competencies)
9. Risk Management (10 competencies or 9% of the set of competencies)

Some of the competencies lend themselves to being placed in one or more of the categories, so these nine categories should be viewed simply as an organizing framework. It should be recognized that the competency statements vary in scope, with some representing global activities and others more discrete and specific actions.

STRUCTURAL VARIABLES

There will be 190 to 210 operational multiple choice questions on the Canadian Registered Safety Professional Examination.

In addition to the specifications related to the competencies, other variables must be considered during the development of the CRSPEX. Structural variables include those characteristics that determine the general appearance and design of the examination. They define the length of the examination, the format/presentation of the examination questions (e.g., multiple-choice format). The weightings of the nine categories are also included as structural variables.

- Examination Length and Format: The examination will consist of between 190 and 210 operational multiple choice questions. With 113 competencies to measure and a sound sampling approach for these competencies, an examination of between 190 and 210 operational questions is sufficient to make both reliable and valid decisions about an examinee's readiness to practice safely and effectively.

- Question Presentation: The multiple choice questions of the CRSPEX are presented in one of two formats, case-based or independent questions

CONTEXTUAL VARIABLES

The Canadian Registered Safety Professional Examination represents the different areas of practice of registered safety professionals.

In addition to structural variables, Contextual Variables: Contextual variables qualify the content domain by specifying the contexts in which the examination questions will be set (i.e., professional context).

It is recognized that practice environment of entry-level registered safety professionals can be any setting of circumstance within which occupational health and safety can be practiced. The competencies assessed by the examination are not setting dependent. The practice environment will be specified when necessary.

In each setting, the CRSP may as a consultant or as an in-house safety professional. This will be considered in forming the context of examination items.

COMPETENCY WEIGHTINGS

To ensure that the examination accurately reflects the profile of the registered safety professional, the competencies were weighted according to their relative importance and frequency based on the survey ratings and a quantitative review by content experts.

These weightings were used to establish the relative emphasis the competencies will receive on the examination. The competencies have been weighted using the importance and frequency ratings obtained in the competency validation study.

The CRSPEX Set of Competencies presents the competencies grouped on the basis of the ratings from the validation survey.

Based on the applicability, importance and frequency data extracted from the 2013 Competency Survey, and with the guideline that the CRSPEX will consist of between 190 and 210 questions, the sampling scheme presented in the table below was developed. The distribution of weights in this sampling scheme was selected: (1) to provide differentiation on the rating variables (importance and frequency); and (2) to conform with the examination length requirement. The following table presents the percentage range of questions in each of the nine categories of competencies.

Competency Categories	Percentage of Questions on the CRSPEX
1. Applied Safety Fundamentals	21-27%
2. Auditing	6-10%
3. Ergonomics	4-8%
4. Fire Prevention and Protection	4-8%
5. Health and Wellness	4-8%
6. Law and Ethics	11-15%
7. Management Systems	11-15%
8. Occupational Hygiene	10-14%
9. Risk Management	10-14%

CONCLUSION

The *Blueprint for the Canadian Registered Safety Professional Examination* is the product of a collaborative effort between BCRSP and Canadian Registered Safety Professionals (CRSP's). Their efforts have resulted in a compilation of the competencies required of the entry level registered safety professional to practice and of the guidelines on how the competencies will be measured on the CRSPEX. A summary of these guidelines can be found in the CRSPEX Examination Development Summary Chart, on page 11.

It is recognized that the health and safety profession will continue to evolve. As this occurs, the Blueprint (i.e., the competencies and the test development guidelines) may require revision so that it accurately reflects the scope of practice, roles, and responsibilities of the entry level safety professional. CRSPEX will ensure this revision takes place in a timely manner and will communicate it in updated editions of this document.

CRSPEX Examination Development Summary Chart

Examination Length and Format	190–210 operational multiple choice questions. Three and a half (3.5) hours will be allocated for the completion of the examination.
Question Presentation	Independent questions 70-90% Case-based questions 10-30%
Competency Categories and Weightings	1. Applied Safety Fundamentals 21-27% 2. Auditing 6-10% 3. Ergonomics 4-8% 4. Fire Prevention and Protection 4-8% 5. Health and Wellness 4-8% 6. Law and Ethics 11-15% 7. Management Systems 11-15% 8. Occupational Hygiene 10-14% 9. Risk Management 10-14%
Item Taxonomy	This exam includes questions falling under three item taxonomy categories: knowledge/comprehension, application and critical thinking.

GLOSSARY

case-based questions: A set of questions associated with a brief scenario.

competencies: The behaviour statements which reflect the combined knowledge, abilities, skills, attitudes, and judgment expected of an entry level registered safety professional.

criterion-referenced (C-R) examination: A test that measures the degree of command of a specified content/skills domain or list of instructional objectives. Scores are interpreted in comparison to a predetermined performance standard, or as a degree of mastery of a defined domain (e.g., percent correct and mastery scores), independently of the results obtained by other candidates. (Brown, 1983)

independent items: Stand-alone objective examination items which contain the information necessary for responding.

operational questions: Questions appearing on the examination that have been pre-tested and that are suitable for the examination. The answer to these questions count in the candidate's score.

CRSPEX COMPETENCY PROFILE

	Applied Safety Fundamentals (ASF)
ASF1	Demonstrate an understanding of workplace inspections.
ASF2	Demonstrate an understanding of incident investigations.
ASF3	Demonstrate an understanding of statistical analysis (e.g., mean, percentage, standard deviation, time weighted average, etc.).
ASF4	Demonstrate an understanding of task analyses/job hazard analyses/job safety analyses.
ASF5	Demonstrate an understanding of material/process flow analyses.
ASF6	Demonstrate an understanding of process hazard analyses (e.g., fault tree analyses, event tree analyses, etc.).
ASF7	Demonstrate an understanding of facility safety (e.g., design, construction, maintenance, etc.).
ASF8	Demonstrate an understanding of the importance of safety in the design and procurement process for tools, equipment and materials.
ASF9	Demonstrate an understanding of the fundamentals of safe use, handling, storage, disposal and risks associated with chemicals, explosives and radioactive material in the workplace (i.e., WHMIS/GHS).
ASF10	Demonstrate an understanding of safeguarding machinery (e.g., point-of-operation, light curtains, interlocks, etc.).
ASF11	Demonstrate an understanding of personal protective equipment.
ASF12	Demonstrate an understanding of electrical safety (e.g., bonding, grounding, circuit interrupter, etc.).
ASF13	Demonstrate an understanding of safe material handling and storage.
ASF14	Demonstrate an understanding of hoisting and conveying equipment safety (e.g., ropes, chains, slings, cranes, conveyors, etc.).
ASF15	Demonstrate an understanding of powered mobile equipment and vehicle safety (e.g., forklifts, scissorlifts, bucket trucks, pickup trucks, vans, fleet safety, etc.).
ASF16	Demonstrate an understanding of hand and portable tool safety.
ASF17	Demonstrate an understanding of shop machinery safety (e.g., lathes, table saws, drill presses, etc.).
ASF18	Demonstrate an understanding of hazards and controls associated with hot work (e.g., welding, cutting, brazing, etc.).
ASF19	Demonstrate an understanding of the control of hazardous energy and harmful substances (e.g. lockout/tagout of hydraulic, pneumatic, steam, mechanical, electrical hazards, etc.).
ASF20	Demonstrate an understanding of hazards and controls associated with automated systems, equipment and processes (e.g., robotics, remote starts, computer controlled systems, nanotechnology, etc.).
ASF21	Demonstrate an understanding of process safety (e.g., chemical, manufacturing, etc.).

ASF22	Demonstrate an understanding of the hazards and controls related to confined space entry.
ASF23	Demonstrate an understanding of the hazards and controls related to elevated work (e.g., ladders, fall protection, platforms, scaffolds, etc.).
ASF24	Demonstrate an understanding of laboratory safety.
ASF25	Demonstrate an understanding of the hazards and controls associated with working alone and working remotely.
	Auditing (AUD)
AUD1	Demonstrate an understanding of auditing principles and techniques.
AUD2	Demonstrate an understanding of how an audit is used to evaluate a management system.
AUD3	Demonstrate an understanding of the role of an auditor (e.g., interviews, verifies, communicates, reports, etc.).
AUD4	Demonstrate an understanding of internal and external audits.
AUD5	Demonstrate an understanding of the audit process (e.g., preparation, pre and post meetings, communication, reporting, continuous improvement, etc.).
AUD6	Identify appropriate audit data collection techniques (e.g., interviews, records, observations, etc.).
AUD7	Demonstrate an understanding of inspections, compliance audits and management system audits.
AUD8	Demonstrate an understanding of how to develop an action plan from an audit report.
AUD9	Demonstrate an understanding of the audit requirements of management systems (e.g., CSA Z1000, OHSAS 18001, etc.).
	Ergonomics (ERG)
ERG1	Demonstrate an understanding of ergonomics (e.g., anatomical, physiological, biomechanical, etc.).
ERG2	Identify the signs and symptoms of musculoskeletal injuries.
ERG3	Apply appropriate ergonomic assessment tools (e.g., surveys, checklists, direct observation, interviews, etc.).
ERG4	Evaluate ergonomic hazards and identify appropriate control measures.
ERG5	Demonstrate an understanding of the abilities and limitations that affect human performance (i.e., cognitive, sensory, and psychomotor).
ERG6	Demonstrate an understanding of regulatory requirements related to ergonomics (e.g., regulations, guidelines, standards, etc.).
ERG7	Demonstrate an understanding of the components of an ergonomics program (e.g., CSA Z412, etc.).
ERG8	Demonstrate an understanding of the role of ergonomics in design and procurement (e.g., workspace layout, tools, equipment, materials, etc.).
ERG9	Demonstrate an understanding of the role of an ergonomist.

	Fire Prevention and Protection (FPP)
FPP1	Demonstrate an understanding of the roles and functions of standard-setting bodies (e.g., National Fire Prevention Association, Underwriters Laboratory, Factory Mutual, Canadian Standards Association, European Union, etc.).
FPP2	Demonstrate an understanding of codes and standards as applied to fire safety (e.g., National Building Code, National Fire Code, etc.).
FPP3	Demonstrate an understanding of life safety (e.g., building design, construction, location, materials, etc.).
FPP4	Demonstrate an understanding of fire chemistry and behaviour.
FPP5	Demonstrate an understanding of fire safety programs.
FPP6	Demonstrate an understanding of fire prevention.
FPP7	Demonstrate an understanding of fire detection systems and devices (e.g., design, application, maintenance, inspection, etc.).
FPP8	Demonstrate an understanding of fire control systems and devices (e.g., design, application, maintenance, inspection, etc.).
	Health and Wellness (HW)
HW1	Demonstrate an understanding of workplace health promotion.
HW2	Demonstrate an understanding of injury, illness, and disease prevention programs (e.g., immunizations, personal protective equipment, hand hygiene, medical screening, etc.).
HW3	Demonstrate an understanding of employee and family assistance programs.
HW4	Demonstrate an understanding of wellness programs (e.g., stress management, physical fitness, weight management, etc.).
HW5	Demonstrate an understanding of disability management programs (e.g., modified work, rehabilitation, return to work, etc.).
HW6	Demonstrate an understanding of addiction control programs (e.g., tobacco, alcohol, drugs, gambling, etc.).
HW7	Demonstrate an understanding of the factors that impact health and wellness (e.g., environmental, social, economic, physiological, lifestyle, etc.).
HW8	Demonstrate an understanding of how factors in the workplace impact worker well-being (e.g., culture, multiple generations, diversity, aging workforce, etc.).
HW9	Demonstrate an understanding of the effects of fatigue on worker health and performance (e.g., shift work, fitness for work, overtime, etc.).
HW10	Demonstrate an understanding of the influence of the psychosocial work environment on worker health and wellness (e.g., leadership, expectations, civility, respect, etc.).
HW11	Demonstrate an understanding of the influence of work/life balance on worker health and wellness.
	Law and Ethics (LE)
LE1	Demonstrate an understanding of the principles of law (e.g., common law, compensation law, product liability, property liability, privacy law, etc.).

LE2	Demonstrate an understanding of occupational health and safety law in Canada (e.g., Internal Response System (IRS), due diligence, criminal liability, general duty clause, etc.).
LE3	Demonstrate an understanding of environmental legislation (e.g., Canadian Environmental Protection Act, Hazardous Products Act, Transportation of Dangerous Goods Act, WHMIS/GHS, etc.).
LE4	Demonstrate an understanding of the duties of workplace parties (e.g., supervisors, workers, joint health and safety committees/representatives, etc.).
LE5	Demonstrate an understanding of the application of ethical theories (e.g., utilitarianism, Kantianism, natural law, etc.).
LE6	Demonstrate an understanding of worker rights (i.e., right to know, right to participate and right to refuse).
LE7	Demonstrate an understanding of the duties and powers of enforcement agencies (e.g., orders to comply, prosecutions, ticketing, administrative penalties, the appeal process, etc.).
LE8	Demonstrate an understanding of the obligations of a CRSP (e.g., with respect to employers, co-workers, public, fellow professionals, contractors, etc.).
LE9	Demonstrate an understanding of the CRSP's obligations with respect to *The Rules of Professional Conduct* (Code of Ethics).
LE10	Demonstrate an understanding of consequences of professional errors and omissions.
LE11	Demonstrate an understanding of the role of the CRSP and limits of professional practice (e.g., interaction with government agencies, scope of practice, boundaries of competence, etc.).
	Management Systems (MS)
MS1	Demonstrate an understanding of the influence of accident theories on the development of management systems.
MS2	Demonstrate an understanding of the integration of health and safety into organizational structure, function, culture and design.
MS3	Demonstrate an understanding of quality management (e.g. ISO 9001, total quality management, etc.).
MS4	Demonstrate an understanding of the functions of management (e.g., planning, organizing, leading, measuring performance, controlling, etc.).
MS5	Demonstrate an understanding of financial and business processes (e.g., budgeting, business case development, management by objectives, policy and procedure development, etc.).
MS6	Demonstrate an understanding of problem solving processes.
MS7	Demonstrate an understanding of conflict management.
MS8	Demonstrate an understanding of labour relations.
MS9	Demonstrate an understanding of strategic planning.
MS10	Demonstrate an understanding of leadership styles (e.g., directive, supportive, consultative, etc.).

MS11	Demonstrate an understanding of change management.
MS12	Demonstrate an understanding of motivation models.
MS13	Demonstrate an understanding of how to develop, implement, evaluate and continuously improve management systems (e.g., CSA Z1000, OHSAS 18001, ISO 14001, ISO 9001, etc.).
MS14	Demonstrate an understanding of sustainability (e.g., occupational health and safety indicators, resource conservation, resource management, etc.).
MS15	Demonstrate an understanding of training needs analyses (e.g., development, delivery and evaluation, etc.).
MS16	Demonstrate an understanding of adult learning principles.
MS17	Demonstrate an understanding of consultation, facilitation, mediation and arbitration.
	Occupational Hygiene (OH)
OH1	Demonstrate an understanding of anatomy and physiology related to occupational hygiene (e.g., lungs, ears, eyes, skin, etc.).
OH2	Demonstrate an understanding of occupational toxicology and routes of entry (i.e., inhalation, absorption, ingestion, injection).
OH3	Demonstrate an understanding of the characteristics, hazards and controls associated with gases, vapours, solvents, fumes, mists, nanomaterials and dusts.
OH4	Demonstrate an understanding of physical hazards and controls (e.g., noise, ionizing and non-ionizing radiation, thermal stress, vibration, etc.).
OH5	Demonstrate an understanding of biological hazards and controls (e.g., mold, mycotoxins, influenza, viruses, etc.).
OH6	Demonstrate an understanding of indoor air quality.
OH7	Demonstrate an understanding of occupational hygiene measurement and sampling (e.g., air, noise, radiation, chemical, etc.).
OH8	Demonstrate an understanding of ventilation (e.g., local, general, supply, exhaust, etc.).
OH9	Demonstrate an understanding of occupational hygiene prevention and protection programs (e.g., respiratory, hearing, thermal stress, medical surveillance, etc.).
OH10	Demonstrate an understanding of occupational exposure limits (e.g., Threshold Limit Values (TLVs), Biological Exposure Indices (BEIs), action levels, etc.) .
OH11	Demonstrate an understanding of hazards and controls associated with lasers.
OH12	Demonstrate an understanding of occupational illness and disease (e.g., asthma, chemical and environmental sensitivity, dermatitis, cancer, etc.).
OH13	Demonstrate an understanding of the role of an occupational hygienist.
	Risk Management (RM)
RM1	Demonstrate an understanding of risk management principles.
RM2	Demonstrate an understanding of risk assessments (e.g., inventory, risk matrix, prioritization, etc.).
RM3	Demonstrate an understanding of the risk control process (e.g., weight of evidence,

	precautionary principle, ALARA, etc.).
RM4	Demonstrate an understanding of residual risk management (e.g., monitoring, reassessment, etc.).
RM5	Demonstrate an understanding of emergency preparedness and response planning (e.g., CSA Z731, NFPA 1600, etc.).
RM6	Demonstrate an understanding of incident command systems (ICS).
RM7	Demonstrate an understanding of business continuity planning (e.g., CSA Z1600, ISO 22301, NFPA 1600, etc.).
RM8	Demonstrate an understanding of workplace violence and harassment prevention programs.
RM9	Demonstrate an understanding of the hierarchy of controls.
RM10	Demonstrate an understanding of hazard communication (e.g., symbols, safety data sheets, labeling, database research resources, hazard awareness training, etc.).