Sector Labour Market Partnership: Phase Four

FINAL REPORT

PREPARED FOR

Ministry of Post-Secondary Education and Future Skills

PREPARED BY

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Final Report

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The Manufacturing Safety Alliance of BC (the Alliance) is a not-for-profit, industry driven, industry-funded health and safety association for manufacturing and food processing companies in British Columbia.

Prepared for the British Columbia Ministry of Post-Secondary Education and Future Skills

The views and opinions expressed in this report are those of the project partners and do not necessarily reflect the official policy or position of the BC government.

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Executive Summary

Occupational health and safety professionals play a central role in keeping British Columbia's manufacturing workers safe on the job. In 2015, the Manufacturing Safety Alliance of British Columbia (the Alliance) entered a Sector Labour Market Partnership (SLMP) agreement with the Ministry of Post-Secondary Education and Future Skills to assess the needs of the manufacturing sector with respect to the OHS profession. Through this, the Alliance has identified that both professionals and employers could benefit from having resources that supports the OHS profession in establishing standards of professional practice.

Beginning in 2022, the Alliance developed the following products to help standardize professional competencies within the OHS profession, align educational programs with these competencies, and provide resources and tools for OHS professional development and hiring practices:

- *The OHS Competency Framework and Profile: Second Edition* (Framework II), which provides a comprehensive guide for OHS professionals in British Columbia's manufacturing sector
- *The Curriculum Alignment Framework*, which maps OHS educational programs in British Columbia to the knowledge and skill elements listed in Framework II, revealing gaps in the coverage of certain competencies and highlighting the need for practical experience and soft skills in OHS education
- *The Competency Assessment Tool* and *Needs Assessment Tool*, which are online resources designed to help OHS professionals assess their OHS competencies and employers define the skillsets they need to support their OHS requirements

The project has received support from educators, trainers, employers, and industry professionals, who all recognize the need for standardized competencies, program accreditation, and professional certification in the OHS profession. Educators and trainers are considering incorporating Framework II into their curricula to address gaps and improve the quality of education. During an external evaluation, twenty-five OHS professionals and nine employers provided feedback on the Competency Assessment Tool and Needs Assessment Tool after a pilot period, where users expressed their satisfaction with the tools and indicated they were likely to recommend the tools to others.

The Alliance created a sustainability plan for ensuring the long-term success of Phase IV's projects and promoting the standardization of the profession. The plan includes the establishment of a technical committee for product maintenance, a communication and outreach plan to promote the availability and usefulness of the Framework and web tools to their audiences, and a proposed feasibility study that would examine pathways to achieve the standardization of the OHS profession.

By strengthening and broadening of key stakeholder partnerships to promote professionalization, this project contributes towards raising the standards of practice for the OHS profession, promoting a culture of safety and well-being, and, ultimately, making British Columbia the safest province to work in the manufacturing sector.

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Introduction

British Columbia's manufacturing sector contributed $16.3 billion to the province's economy in 2021, representing 6 percent of the British Columbian gross domestic product.[1] In the same year, the manufacturing sector employed 179,300 workers across a diverse set of subsectors, including food and beverage manufacturing, wood manufacturing, and transportation equipment. This represents a 12 percent increase in the sector's labour force since 2020, which has been forecasted to continue as BC increases its export of manufactured goods.

This growth has contributed to a need for people who are highly trained in promoting worker health and safety within manufacturing workplaces. These highly trained people, called *occupational health and safety (OHS) professionals*, are important for the sustainable and responsible growth of the manufacturing sector. The Manufacturing Alliance of British Columbia (the Alliance) is the industry-led, non-profit health and safety association that helps British Columbia's manufacturers and food processors build safety programs to protect workers and reduce costs. Founded in 2007 to address high injury rates in the food processing sector, the Alliance now offers virtual and on-site services to over 3000 member-organizations within the province, helping workers reduce their exposure to harm and organizations lower their insurance premiums by 27 percent.[2] Worker safety in British Columbia is protected by the Workers Compensation Act; however, there exists no legislation that regulates the OHS profession within a workplace. Given this, the OHS profession has historically experienced difficulties in developing or maintaining consistent standards of practice. In 2016, the Ministry of Post-Secondary Education and Future Skills (the Ministry) began supporting a multi-phase project led by the Alliance through the sector labour market partnership (SLMP) program. This project aims to foster collaboration between sector organizations, OHS professionals, and other stakeholders to support the OHS professional working within manufacturing, with the goal of making British Columbia the safest province to work in the sector. The current forth phase of the project (Phase IV or the Project) began in February 2022.

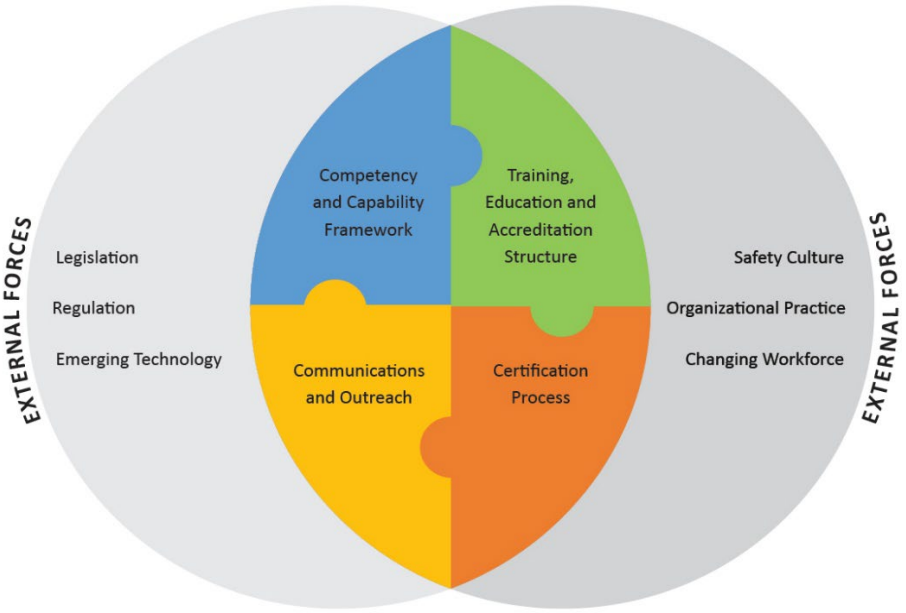
This report aims to provide all Phase IV stakeholders with a thorough understanding of the Project's progress, achievements, and challenges. The background section reviews the projects that led to Phase IV and will introduce this phase's overall strategy and objectives. The following sections then summarize the progress of this Project, introduce several evaluations of their objectives, and outline a plan for sustaining this Phase's progress beyond the completion of this current SLMP. This report provides stakeholders with an opportunity for reflection, learning, and decision-making, providing insights into this project's strengths and weaknesses and offering a roadmap for sustainable success beyond the project term.

[1] Statistics Canada. *Table: 36-10-0402-01 Gross domestic product (GDP) at basic prices, by industry, provinces and territories* (Ottawa: Statistics Canada, 2023) https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610040201
[2] The Alliance. *2022 Annual Report* (Chilliwack: The Alliance, 2022) https://safetyalliancebc.ca/download/2022-annual-report/.

BACKGROUND

Before Phase IV, the Alliance completed four other projects funded through the SLMP. The outcomes of each project led into the following which, in turn, motivated the initial proposal for Phase IV's funding. Each of these phases contributed to the strategy developed, shown in Figure 1.

FIGURE 1: STRATEGIC AREAS



Phase I: Sector Engagement

The first SLMP-funded project, completed in July 2016, represented the Alliance's first concentrated research effort in identifying and addressing the OHS needs of British Columbia's manufacturing sector. The primary focus of this phase was to unite key stakeholders and partners to understand the unique dynamics of the sector. Through these consultations, it became evident that organizations sought knowledgeable and competent OHS professionals to navigate the evolving challenges of the manufacturing context, which required a blend of technical aptitude and people-centric skills.

This initial collaboration also identified several barriers to improving safety culture within organizations, such as a rapidly growing workforce, changing workforce demographics, and higher-than-average injury rates. This allowed the Alliance to demonstrate that there was a pressing demand to foster consistent standards of practice within the OHS professionals, which established the value of conducting further in-depth labor market research focussed on designing tools for professional development and training.

Phase II: OHS Labour Market Information Study

Building on the insights gained from Phase I, Phase II, which ended in July 2017, sought to better understand the current state of the OHS profession within the manufacturing sector through a labour market information study. This involved continuing and expanding the Alliance's collaborative efforts

with manufacturing organizations, sector-relevant professional associations, labour organizations, and educational institutions.

This study established a lack of consensus on what knowledge, skills, and abilities were required for OHS professionals practicing within the province, and identified effective practices associated with improved safety culture within manufacturing organizations.

Stakeholders recognized that the rapid pace of technological change, emergence of new risk areas, evolving regulations, and persistent labour shortages complicated by an aging workforce, present manufacturers with challenges in maintaining their organizations' safety systems. Additionally, OHS professionals, higher educational institutions, and employers all recognized that Canada lacked a professional standard for its OHS professionals; this, combined with the overwhelming number of Canadian and international OHS certificate programs, has contributed to sector-wide confusion around how to determine whether a professional was indeed able to responsibly practice the OHS profession.

Through consultation, it was identified that the future of the OHS profession within the manufacturing sector required senior management teams within organizations to recognize the value of OHS management systems, and further emphasized the importance of systematically addressing potential knowledge, skill, and ability gaps within the OHS profession.

Phase III: Strategy Development and Sustainability Plan

In October 2018, the Alliance developed a plan to action the opportunities and challenges identified within the previous phases. Continued sector-wide consultations during this phase resulted in stakeholders rallying behind the development of a program that would facilitate consistent professional development for OHS professionals. It was assumed that such a program would not only address the immediate issues within the sector but would also have broader applications across other industries and regions within Canada.

The strategic plan outlines four strategic areas, shown in Figure 1: a *competency and capability framework* for OHS professionals, an *accreditation structure* for higher educational institutions, a *certificatory system* for OHS professionals, and a *communications and outreach* plan. The framework would provide a description of the individual knowledge and skill components required to work as an OHS professional. This framework would be developed with a special attention towards the manufacturing sector's needs and would also provide the foundation for future accreditation or standardization initiatives within OHS professional education. The accreditation system would establish a process for British Columbian institutions to validate their OHS professional educational programs against some set of standards, which would include the competency framework. The certificatory system would allow OHS professionals to judge their readiness to responsibly practice the OHS profession, by comparing their education and experience against some set of standards, which would also include the competency framework. These three initiatives would be targeted towards members of the OHS community through a unified communications plan. Ultimately, this plan outlined a strategic initiative that stakeholders accepted as addressing the findings from the previous phases and endorsed its potential to help position manufacturing as British Columbia's safest sector.

Phase IV-A: OHS Competency Framework

Phase IV-A focussed on the development of *The OHS Professional Competency Framework* (the Framework), which was published in October 2021. To construct this Framework, the Alliance conducted thorough research on existing frameworks from the British Institution of Occupational Safety and Health (IOSH) and the International Network of Safety & Health Professional Organizations (INSHPO). This allowed the Alliance to create a comprehensive list of competencies for OHS

professionals, which incorporated additional manufacturing-specific components and refined the terminology through consultations with industry representatives from the manufacturing sector.

This list was used to create distinct, action-oriented units that delineated various levels of competence that a professional could achieve. These units were then organized into thematically consistent areas by collaborative efforts involving OHS experts and industry representatives. The resulting Framework was meticulously designed to serve as a comprehensive guide for stakeholders within British Columbia's manufacturing sector.

Ultimately, the Framework is intended to remain relevant even as the manufacturing sector itself changes in response to an aging workforce, emerging technologies, and challenges posed by new risk areas such as the COVID-19 pandemic. The Framework's applications extend to the development of new professional development resources, the establishment of accreditation or standardization bodies, and the creation of consistent educational curricula for OHS professionals. Phase IV-A laid the groundwork for a more preventive and holistic approach to defining the OHS profession in British Columbia, meeting the challenges that were identified by the previous phases.

PHASE IV'S STRATEGIC OVERVIEW

In May 2022, the Alliance established the vision, guiding principles, goals, and objectives for Phase IV. The current project aims to support workers and employers within British Columbia's manufacturing sector by taking steps towards standardizing the practice of the OHS profession. To do this, this SLMP initiative focussed on building a standardized competency framework for the manufacturing sector OHS professional and developing free-to-use tools for assessing competency levels.

Vision

OHS professionals support the development of a culture of safety and well-being within the manufacturing sector, making it the safest place to work within British Columbia.

Guiding Principles

1. The OHS field is an integral part of the success of an organization within the manufacturing sector
2. The OHS profession continuously evolves to reflect changing OHS needs and organizational priorities
3. OHS professionals create a culture of safety and well-being across the sector
4. Professional standards for the OHS profession can foster increased understanding and agreement across the manufacturing sector on the definition and purpose of the OHS profession
5. OHS professionals, who are recognized for their practical experience, competencies, and professional capability, are sought-after and regionally accessible resources
6. Professional standards for any profession, including the OHS profession, are supported by a knowledge- and skills-based model of competencies and consistent education and training practices
7. OHS training and education can be broadly accessible within British Columbia through establishing consistency between the province's higher educational institutions

Goals

The Alliance defined four goals for the project that contribute towards fostering the standardization of the OHS profession within the manufacturing sector:

1. Build and validate a competency framework for the OHS profession that establishes the skills and knowledge that make up the scope of practice for OHS professionals
2. Build and validate a competency profile that describes the minimal levels of competence needed to responsibly practice the OHS profession
3. Establish free-to-access tools that can support OHS professionals in their professional development and help manufacturing employers in hiring competent professionals
4. Work with higher educational institutions within British Columbia to identify the degree of alignment between the educational curricula offered to prospective OHS professionals and identify pathways to establish inter-institutional consistency

Outcomes

The project aims to achieve the following outcomes:

1. Convene a project governance committee composed of representative organizations, and a representative of the Ministry as an ex-officio member, to provide effective oversight and review and validate any deliverables
2. Convene a higher education subcommittee comprised of a minimum of ten subject matter experts to help with the creation of a report and resource that provides insight into how the OHS professional education programs within British Columbia differ with regards to their curricula and how these differences could be reconciled
3. Convene an advisory committee of OHS subject matter experts to assist with the creation and validation of a competency profile for manufacturing specific OHS professionals that includes competency thresholds, a curriculum alignment framework that aligns OHS training in British Columbia with the Alliance's competency framework and online competency tools
4. Develop a communications strategy which addresses all aspects of the Project requiring communication to the Project's stakeholders. This includes establishing communication goals, target audiences, and key messages. A critical aspect of this communication strategy will be establishing a plan for gathering participants for the Project's pilot testing components
5. Develop free-to-use tools for the manufacturing sector to assess competency levels of OHS Professionals for recruitment and training purposes, and for use in assessing organizational needs and defining competency profiles when hiring OHS Professionals
6. Pilot the tools with industry stakeholders that are representative of the diversity of the manufacturing sector in British Columbia including, but not limited to, OHS professionals and manufacturing employers
7. Evaluate all project activities, including but not limited to the impact, uptake, and efficacy of the tools that are developed

By focusing on these goals, objectives, and outcomes, the current project aims to contribute towards the standardization and professionalization of the OHS profession for the manufacturing sector. Through the development of a standardized competency framework and the creation of free-to-use tools for assessing competency levels will contribute to raising standards for the application of the OHS profession within manufacturing organizations, to the benefit of both organizations and their workers.

Project Activities Summary

Throughout Phase IV, the Alliance and its collaborators have developed several products, aimed at supporting the development and training of OHS professionals within British Columbia's manufacturing sector. This section reviews the products produced throughout this phase and provides a narrative summary of the deliverables specified by the project workplan.

Summary of Products

Three products were developed during Phase IV: the *OHS Professional Competency Framework and Profile,* the Curriculum Alignment Framework, and the OHS Web Tools. The following section provides a narrative description of each product's purpose, design, and development over the course of the project's deliverable reports.

OHS Professional Competency Framework and Profile: Second Edition

This project first sought to create and validate a competency profile for manufacturing specific OHS professionals. This competency profile would help standardize professional competencies within OHS and provide a common understanding of the unique knowledge and skills that OHS professionals practicing in British Columbia should possess.

Phase IV-A of the project published the OHS Professional Competency Framework, which described the comprehensive set of knowledge and skill elements that fall within the OHS profession's scope of practice. This Framework represented the integration of competencies established by IOSH and INSHPO along with competencies specific to the manufacturing sector in BC. Originally, Phase IV-B was designed to use this Framework to build a competency profile; however, after consultation with a collective of over thirty professionals, safety science experts, and industry representatives, the Alliance performed a series of major revisions to the original OHS Competency Framework. These revisions, carried out over the course of Deliverables 3, 4, and 5, resulted in the creation of the *Occupational Health and Safety (OHS) Competency Framework and Profile: Second Edition* (Framework II).

Framework II represents a unified approach to provide the OHS profession with a competency framework and a competency profile. Framework II retains the content from the previous edition but features more focussed and consistent descriptions of competencies as specific behaviors demonstrated by OHS professionals. Competencies are sorted into eight thematic knowledge areas, such as "Hazard Identification and Risk Control" and "Physical and Psychological Health." Within each area are several units, which describe the knowledge, skills, and behaviors required to attain or demonstrate a specific competency. The Framework also includes three levels of competence within each unit, with specific observable behaviors that indicate the level of mastery over a competency and a single level endorsed as the minimally acceptable level for responsible professional practice.

The Framework represents the collaboration of OHS professionals, subject matter experts, researchers, and educators that strived to establish more consistent professional standards for OHS professionals within BC, Canada, and internationally. The Advisory Committee, who found it unacceptable to allow for the incompetent application of the OHS profession, provided guidance to the Alliance on how to revise the original competency framework into Framework II; this allowed the document to provide a rigorous definition of what it means to be a functionally adequate OHS professional. Framework II established a British Columbia-specific description of the OHS profession and its competencies, which allowed for the

design of future products and initiatives by the Alliance. Framework II has been finalized but will be professionally typeset before its publication.

Alignment Framework Matrix

In Phase IV, we also intended to develop a curriculum alignment framework that would help align OHS professional education in British Columbia with competencies contained in Framework II. Part of this involved the development of the Alignment Framework Matrix, a document that contained mappings between individual courses and programs within BC to the Framework's units. Ideally, this alignment would allow for the Alliance and its partners to identify which courses and programs were of value to specific OHS professionals, given their professional development needs.

The research team collected data from 10 programs and 139 syllabi to construct this matrix. The team conducted a computer-assisted text analysis, called text embedding, to process each syllabus and the Framework's contents. These text embeddings allow for a document's semantic contents to be represented as a fixed-length list of numbers. These lists would then allow for consistent representation of the semantic relationships between sets of words, enabling comparisons between texts.

Text embeddings are a validated approach to text analysis within the social sciences, who rely on it when working with large bodies of text that must be consistently compared against each other. The research team measured the distance between each syllabus and each unit's semantic contents, which resulted in a total of 10,964 comparisons between syllabi and Framework units. This revealed several units in the Framework as being chronically under-covered by the OHS professional education programs within British Columbia.

This analysis was later validated by the higher educational committee in both individual and group conversations with the Alliance research team. The matrix later was shared with the educational institutions involved in the matrix's creation, where representatives found the matrix to be a useful tool in identifying the strengths and weaknesses of their own programs' coverage of the competencies necessary to be an OHS professional. This information also allowed for the Alliance to develop a list of courses within British Columbia to recommend to OHS professionals who wanted to professionally develop a specific competency within the Framework. These mappings were ultimately incorporated within the web tools that were also under development throughout Phase IV-B.

OHS Web Tools

Framework II served as the basis for the development of the OHS Competency Tools (the Tools), which include a competency assessment tool (CAT) for OHS professionals and a needs assessment tool (NAT) for organizations. The CAT enables OHS professionals to self-assess their knowledge and competence against the *Framework*, providing them with a detailed competency profile that can be used for professional development planning and job postings. The NAT enables organizations to assess their OHS needs against the Framework and generate a job description to recruit OHS professionals that aligns with their specific requirements.

The goal of the Tools is to promote standardization within the OHS profession, increase understanding and agreement across the manufacturing sector on the definition of an OHS professional, and increase the use of career planning, recruitment, and professional development standards and tools in the manufacturing sector.

SUMMARY OF DELIVERABLES

At present, the project has completed seven deliverables on the initial project workplan; the two that remain are the Final Report (this current document) and a project presentation to the Ministry. This section provides a narrative summary of each deliverable, including a description of the project's activities, the involvement of participants, and the contributions of the project's steering committee.

1. Project Management Workplan and Evaluation Strategy
2. Communication Strategy and Environmental Scan
3. OHS Competency Profile Report
4. Interim Report
5. OHS Curriculum Alignment Framework
6. OHS Competency Tools, Pilot, and Report
7. Draft Final Report
8. Final Report
9. Project Presentation.

Deliverable 1: Workplan and Evaluation Strategy

Planned Submission Date: June 30, 2022

Actual Submission Date: June 30, 2022

Deliverable 1 outlined the activities and milestones that would be undertaken throughout the project, and provided an evaluation strategy that described how the project's goals will be measured and assessed.

The project set its goal to create a series of resources that would support the adoption of the Alliance's *Framework* in British Columbia's manufacturing industry. These resources include a curriculum alignment framework for OHS educational programs, a competency self-assessment tool for OHS professionals, and a tool for employers to create job postings targeting specific OHS competencies. The goal was to help stakeholders incorporate the content of the Framework into their own contexts and improve communication between OHS professionals and employers.

The project is a collaboration between the Alliance and various stakeholders, including post-secondary institutions and industry representatives. This deliverable divided responsibility for the project between these different bodies, with the Alliance holding itself accountable for coordinating the project and ensuring that the deliverables are completed within the agreed-upon timelines and to high-quality standards. Per the SLMP guidelines, the Alliance worked with a Steering Committee made up of industry, education, regulatory and government representatives based in BC. This Steering Committee would be the project's decision-making body and would be consulted throughout the project to provide input into the Alliance's developed products. The Alliance would also form an Advisory Committee of OHS experts to inform the products' developments, and a Higher Education Committee to provide recommendations in carrying out the direction provided by the Steering Committee from the perspective of higher educational institutions.

This deliverable also included an evaluation plan, which was designed by the Qatalyst Research Group to evaluate the results of this contract. This plan specified methods for assessing the relevance of the project to the needs of educators, employers and OHS professionals; the progress made toward achievement of the intended outcomes in the short-term and medium-term; and the effectiveness of the program design and delivery.

Deliverable 2: Communication Strategy and Environmental Scan

Planned Submission Date: July 29, 2022

Actual Submission Date: August 19, 2022

This deliverable focussed on preparing resources that would be later necessary to develop and launch the project's intended products. This included an environmental scan, which sought to identify opportunities for the project to strengthen the position of OHS professionals within the BC manufacturing industry, and a communication strategy to deliver the project's products to potential users.

The environmental scan explored two main questions about OHS professionals. Firstly, it examined how the knowledge and skills of OHS professionals uniquely enable them to improve the health and safety of workers in manufacturing organizations. The scan identified two primary trends within OHS practice and policy in Canadian workplaces: the shift of responsibility for safety from organizations to workers and the increasing distance in the relationship between workers and employers. OHS professionals were uniquely able to address these trends by working as system managers and information managers; the scan hypothesised that this would help distribute responsibility for workplace safety across an entire organization and would facilitate open and honest conversations about health and safety.

Secondly, the scan investigated how OHS professionals organize their profession in BC, Canada, and internationally. The scan revealed the need for a stronger organizational structure, including more robust certification and education practices, to protect and popularize the expertise of OHS professionals in the manufacturing industry. The scan provides five calls-to-action for further development and growth of the OHS profession, including: understanding OHS as both an art and a science, understanding the purpose of the OHS profession within a broader context, reframing the purpose of certification, establishing alignment between educational programs, and defining the ideal structure of the profession.

The communication plan, created by Argyle in consultation with the Alliance, outlined a communication strategy to help achieve the project goals of establishing baseline professional competencies within OHS. The communication plan offered objectives and tactics to help inform OHS professionals, their employers, and post-secondary institutions about the Framework and its associated assessment tools. Overall, this plan would contribute towards stakeholders viewing the Framework as an essential resource for improving health and safety practices in the manufacturing sector in BC.

Deliverable 3: OHS Competency Profile Report

Planned Submission Date: October 31, 2022

Actual Submission Date: November 18, 2022

This deliverable concentrated on the development of the OHS Competency Profile, which uses the Framework to establish minimally acceptable levels of competence for the OHS professionals working in the BC manufacturing sector. The initial goal of the deliverable was to convene the Advisory Committee and a larger body of manufacturing OHS subject matter experts to design and administer a process that provides recommendations on which of the Framework's elements of competence defined a functionally adequate OHS professional; these recommendations would then form a draft competency profile to be approved by the Steering Committee.

The Alliance gathered a group of thirty-five subject-matter experts and grouped them into eight jury panels that each represented a specific body of expertise over a knowledge area within the Framework. The individual competencies within each area, themselves, are organized into three levels of

competence that theoretically described three different degrees of mastery a professional could have over that competency. At each jury meeting, an Alliance-affiliated researcher would guide the group in reaching an expert-supported agreement on the most appropriate level within each unit that could be included in a competency profile. This agreement was measured in votes, with a minimum two-thirds supermajority for a given level representing agreement.

During multiple jury panels, the subject matter experts identified elements of the Framework that they believed were either too vague, too restrictive, or too confusing to vote confidently upon. The subject matter experts in some cases would refuse to vote on certain units, as they lacked confidence that they understood the overall purpose or relevance of specific Framework components. This caused some deviations from the original development plan, as the Alliance expected that the jury panels would uniformly support the current content and structure of the Framework.

The Alliance presented these results to the Advisory Committee, where it was advised that the Framework would need to undergo substantial revisions before it could be converted into a competency profile. This would represent a major departure from the initial project timeline; however, the Advisory Committee overall thought these changes would support the further sustainability of the project's products. The Steering Committee was later presented with the Advisory Committee's advice and decided that a plan to conduct these revisions should be finalized and actioned before progress on the competency profile could continue.

Deliverable 4: Interim Report

Planned Submission Date: March 31, 2023

Actual Submission Date: March 31, 2023

This interim report provided an overview of the progress made by the Alliance in attaining the goals of Phase IV. This included an overview of the previous three deliverables and emphasised the Steering Committee-supported decision to pursue systematic edits to the Framework to ensure its clarity and concision, as per the subject matter experts' recommendations.

After Deliverable 3, the Alliance conducted an analysis of the transcripts from the subject matter experts jury sessions to identify the necessary changes to improve the quality of the Framework. Through this analysis, the Alliance made several recommendations to the Advisory Committee, then to the Steering Committee, on how to proceed with turning the Framework into a competency profile. These recommendations addressed subject matter experts' concerns, such as inconsistent language, which could be resolved by creating a glossary and by restricting the Framework's use of OHS jargon to more universally accepted terms, and hard-to-read competency units, which could be addressed by rewriting the elements of competency to promote a simpler and more consistent unit structure.

This analysis also found the need to describe the levels of competence consistently across each unit of the Framework, ensuring that the highest levels on each unit described the apex of OHS professional practice. This would allow each unit to consistently explain the steps necessary to attain a specific competency within the OHS profession, which would overall simplify the Framework into a more usable document.

The report also highlighted four key lessons learned from the project's experiences thus far:

1. The Framework should be treated as a living document, that should be expected to adapt and change along with the nature of work within BC's manufacturing sector
2. The project originally assumed that the Framework would not need immediate revisions, which later led to unexpected deviations from the initial workplan

3. Stronger guidelines and mechanisms, such as style guides for the Framework's content and structure, should be developed to ensure the sustainability of project-developed products
4. The engagement of experts as partners throughout the project has brought forth novel and diverse ideas

This deliverable also outlined a process for editing the Framework and producing a competency profile from it. This process would be conducted alongside the development of web tool resources and the initial meetings of the higher education committee; this change to the project plan was ultimately supported by the Advisory Committee and approved by the Steering Committee.

Deliverable 5: Curriculum Alignment Framework Report

Planned Submission Date: July 26, 2023

Actual Submission Date: September 9, 2023

The Curriculum Alignment Framework Report sought to evaluate the alignment between post-secondary OHS educational programs in the province against the OHS Professional Competency Framework and Profile. The report was developed through a mixed research methods approach, combining quantitative and qualitative data analysis. The Alliance worked with higher educational institutions across BC, evaluating a total of 10 OHS professional education programs through their curricula materials, questionnaires, and through consult with the expertise of the ten-membered Higher Education Committee.

This work generated valuable insights into how to better design OHS education to ensure that entry-level professionals possessed the necessary knowledge, skills, and abilities to responsibly practice their profession. The research revealed that the current programs exhibit significant diversity in their duration, curricular foci, and outcome credential (e.g., degree, diploma, or certificate). These differences stem from varying levels of prior experience and education among each program's target audience, with certificate programs catering to those with existing experience as safety workers, and bachelor's programs accommodating individuals with less prior exposure. Differences in each program's entry requirements and level of experiential learning further contributed to this lack of consistency, which underscored the multifaceted needs of aspiring OHS professionals, and the challenges that higher educational institutions face in designing programs that prepare these students with the technical and soft skills essential for success in the field.

The analysis of these programs' alignment with the Framework indicated that large swaths of professional competencies were not covered by any program's curricula. This result, along with interviews with the Higher Education Committee, suggested the need for higher educational institutions to place more emphasis on offering students practical experience as OHS professionals through practicums, internships, and mentorships. It also found that OHS professional education would benefit from inserting certain elements within their current program design to cover current gaps, such as establishing soft skills and within the fundamental aspects of OHS.

The Higher Education Committee was instrumental in the development of this deliverable. Through their expertise and input, the Higher Education Committee members contributed to the comprehensive analysis of the OHS educational programs and the alignment with the Framework. The Higher Education Committee members agreed that a top-down standardized approach to establish accredited work-integrated learning programs would be the most efficient way to ensure the future health and success of the OHS profession.

Deliverable 6: OHS Competency Framework Aligned Tools and Report

Planned Submission Date: August 29, 2023

Actual Submission Date: August 29, 2023

This report reviewed progress made towards developing a series of resources to foster consistent professional standards across the OHS profession within the manufacturing sector. This included a review of the completed *OHS Competency Framework and Profile: Second Edition*, which resulted from actioning the changes included within the Interim Report.

The new edition of the Framework, or Framework II, outlines the scope of practice for OHS professionals in the manufacturing industry and serves as the basis for the development of the Tools. Its development included the rewriting of every unit within the Framework, the reorganization and elimination of several units, and the adoption of a glossary for OHS terminology. Framework II was presented to the subject matter experts and the Advisory Committee, where both bodies agreed that the new Framework was easier to understand and contained a more complete description of the OHS profession. Framework II also contained a competency profile, which detailed the minimally acceptable levels of competence necessary for functionally adequacy as an OHS professional. These changes were ultimately validated by both the subject matter experts and the Advisory Committee.

The web tools were built using the revised Framework's content. Two tools were designed, each to be contained within the same web-based application: A Competency Assessment Tool for OHS professionals, and a Needs Assessment Tool for organizations. The Competency Assessment Tool would allow for OHS professionals to self-assess their knowledge and competence against the Framework, providing them with a detailed profile that could be used for professional development planning and job applications. The Needs Assessment Tool would enable organizations to assess their OHS needs against the Framework and generate a job description to recruit OHS professionals that aligns with their specific requirements. Together, these web tools were designed to help promote standardization within the OHS profession, increase understanding and agreement across the manufacturing sector on the definition of an OHS professional, and increase the use of career planning, recruitment, and professional development standards and tools in the manufacturing sector.

At the time of delivery, a draft of the web tools had been prepared, but pilot testing had not yet begun. In consultation with the Steering Committee, the Alliance agreed that more time would be required to gather feedback and evaluate each tool's acceptance and effectiveness with its target audience. Argyle performed additional work with the Alliance's web developer, Streamline, to improve the design and functionality of the tools. In addition, the project's external evaluation firm, Qatalyst, worked with the Alliance to collect and analyze data through document reviews, surveys, and interviews.

Project Evaluation

Qatalyst Research Group was contracted by the Alliance to perform an external evaluation of the progress and effectiveness of Phase IV in meeting the needs of educators and trainers, employers, and OHS professionals in the manufacturing industry in British Columbia. Their evaluation aims to determine the relevance of the project, the progress made towards achieving the intended outcomes, and the effectiveness of the program design and delivery.

The evaluation audience—which includes the Alliance, the Ministry of Post-Secondary Education and Future Skills, the Steering Committee, and members of the OHS community—wants to know the relevance of the project to educators, employers and OHS professionals, the progress Phase IV-B made toward achievement of the intended outcomes in the short-term and medium-term, and the overall effectiveness of the program design and delivery. This section presents the evaluation framework and findings from Qatalyst's report.

Evaluation Framework

The evaluation framework details the evaluation questions Qatalyst sought out to answer, the teams responsible for contributing to the evaluation, and the methods used to collect and analyse project-relevant data.

Key Evaluation Questions

The evaluation plan outlined a series of evaluation issues to be addressed in the final evaluation report, gathered under three categories.

Relevance

1. Do academic institutions and training providers, employers and OHS professionals recognize the need to adopt a standardized framework and develop training accreditation and professional certification for OHS profession in BC manufacturing industry?
2. Was the design of this project appropriate given the intended long-term and ultimate outcomes of the project?

Effectiveness

3. What has been the level of participation in the project (e.g., use of the tools, participation of the Steering Committee and advisory groups, and review of the OHS Curriculum Alignment Framework)?
4. Are users (employers and OHS professionals) satisfied with the tools and the resulting outputs? How have the outputs of these tools been used by employers and OHS professionals (e.g., in guiding recruitment and training, and defining career paths and facilitating, and facilitating access resources to become an OHS professional)?
5. Is Framework II and thresholds supported by educators and trainers and industry? Is it increasing understanding and agreement on the definition of an OHS Professional and the required competencies?
6. Has recognition of the need for and benefits of program accreditation and professional certification increased?
7. Are educators and trainers considering or planning to incorporate Framework II and thresholds into their curricula? What further work is required to advance that?
8. What unintended outcomes, positive or negative, can be attributed to the project?

PROJECT DELIVERY

9. Has the project been delivered as planned? In what manner and to what extent have the intended outputs been produced?
10. What key factors have contributed to the success of the project? What have been the key obstacles to success? What have been the best practices and lessons learned from the project?
11. What are the recommended next steps to be taken towards achieving the intended longer-term outcomes of a standardized OHS Competency Framework for the manufacturing industry, accredited training & education programs, and an OHS professional certification program for manufacturing?

Evaluation Team

Qatalyst is recognized as one of the leading public sector consulting firms in Canada and have created an extensive network of over 150 associates located across Canada and internationally. Their mission is to deliver leading-edge consulting services in a rapidly changing world. For more than 30 years, they have undertaken nearly 1,000 assignments for businesses, government, non-profits, and regional and Indigenous organizations with a particular focus on strategy, economic development, public policy, performance measurement and evaluation, organizational development and reviews, and service delivery model development.

During the project, the public relations firm Argyle provided support in designing and piloting the OHS web tools. Argyle is one of North America's largest and most acclaimed engagement, communication, and reputation advisory firms. Their clients span many sectors, including finance, technology, health care, agri-food, travel, professional services, infrastructure, government, and non-profits. Founded in 1979, they are now supported by 140+ full-time professionals in major cities across the continent.

Evaluation Method

The evaluation plan stipulated several outputs including an interim report and final report. The interim report was submitted to the Alliance in December 2023. At that time, Qatalyst took the following evaluation steps:

- **Met with representatives of the Alliance directly involved in project management activities**
- **Participated in each meeting of the Steering Committee.** The Alliance's Steering Committee met regularly to discuss the status of the project at key milestones
- **Reviewed background documents on the project.** This included the project application, contract, and initial work plan, as well as outputs from the current and previous phases of the SLMP projects
- **Conducted a survey of employers and OHS professionals who tested the pilot tools.** Qatalyst administered a short survey with employers and OHS professionals who participated in the pilot to obtain immediate feedback on how they became aware of the tool, why they were interested in using the tools, their satisfaction, their perceived strengths and weaknesses of the tools, and their willingness to recommend the tools to others

Before submitting their final report to the Alliance in January 2024, Qatalyst took the following evaluation steps:

- **Reviewed the OHS web tools and the results of their pilot testing**
- **Reviewed the effectiveness of promotion and outreach efforts.** Qatalyst sought to gauge the level of involvement from post-secondary institutions, employers, OHS professionals, and other stakeholders

- **Conducted a follow-up survey of participating employers and OHS professionals.** Pilot test participants were sent this survey approximately one month after using the tools to learn about how users used the tool outputs, how useful these outputs were, whether users acted differently because of the tool, and expectations of the user's future actions
- **Obtained input from a sample of key informants**. This included members of the Advisory Committee, the Higher Education Committee, Subject Matter Experts, and the Steering Committee
- **Conducted interviews with representatives who have been involved with the project.** This included further discussions with the Alliance and other key stakeholders to obtain input on the project's progress, the project's degree of success, perceived impacts, and opportunities for improvement

Limitations in the methodology include the reliance on self-reported data from survey respondents and key informants, potential bias in participant selection for interviews, and the potential for limited generalizability of findings due to the specific context of the manufacturing industry in British Columbia. However, efforts have been made to mitigate these limitations through rigorous data collection and analysis techniques.

Evaluation Findings

The evaluation findings include a description of the logic model used to evaluate the project's successes and limitations, as well as structured answers to each of the evaluation questions posed in the evaluation framework.

Logic Model

A logic model is a representation of the chain between investment in a project's activities and outputs and its desired results. Qatalyst uses logic models to help in interpreting program data and developing conclusions regarding the extent of a project's effectiveness.

Phase IV-B's logic model contains its major activities and outputs associated as well as their intended outcomes. These outcomes are divided into different categories: *Immediate outcomes* result directly from the delivery of the project, *intermediate* and *long-term outcomes* are anticipated after the achievement of immediate outcomes, and *ultimate outcomes* represent the furthest reaching changes that could reasonably be attributed to the program.

In the immediate term, the project was expected to establish competency thresholds for the OHS profession, assess inter-curricular alignment between British Columbia's post-secondary institutions, conduct pilot programs for online assessment and job profiling tools, and execute a communication and outreach strategy. These activities were assumed to lead to better awareness and understanding of the competencies required to practice the OHS profession, improvements in employer recruitment processes, better-defined job profiles for OHS professionals, and increased support from both industry and academia for Framework II and need for stronger structures within the OHS profession.

In the longer-term, the project's products would contribute towards the development of training accreditation and professional certification systems that would standardize OHS education, ensuring that OHS professionals are prepared to develop and maintain OHS systems within manufacturing organizations across BC. This would contribute to the ultimate objective of allowing manufacturing OHS professionals to support the development of a culture of safety and well-being within the manufacturing sector, making it the safest place to work within British Columbia.

TABLE 1: LOGIC MODEL FOR THE 2022-24 ALLIANCE SLMP PHASE IV-B

Activities	Outputs	Intended Outcomes			
		Immediate	Intermediate	Long-Term	Ultimate
• Define thresholds for competency requirements • Develop & pilot assessment tools for employers & OHS professionals • Review alignment of curricula with Framework II • Implement communication & outreach strategy	• Resource defining thresholds for competency requirements • Free-to-use assessment tools available online • OHS Curriculum Alignment Framework • Communications and outreach	• Increased awareness and understanding of the required competencies for OHS professionals • Improvements in employer recruitment and training of OHS Professionals • Increased awareness of career paths and access to resources to become an OHS professional • Increased industry and academic support for Framework II, thresholds, tools and need for program accreditation and professional certification	• Increased understanding and agreement across the manufacturing sector on the definition of an OHS professional • Increased understanding among OHS professionals about the competencies and capabilities required to be employed in the manufacturing sector • Increased use of the career planning, recruitment, and professional development standards and tools for OHS in the manufacturing sector by employers and OHS professionals • Incorporation of Framework II and thresholds into curricula • Progress towards adoption of a standardized framework and development of training accreditation and professional certification	• Standardized OHS Competency Framework for the manufacturing industry • Relevant and accredited training & education program standards for OHS professionals in manufacturing • Recognized and adopted OHS professional certification program for manufacturing	• Manufacturing OHS professionals support the development of a culture of safety and well-being, making the BC industry the safest place to work

Evaluation Results

Question One

Do academic institutions and training providers, employers and OHS professionals recognize the need to adopt a standardized framework and develop training accreditation and professional certification for OHS profession in BC manufacturing industry?

The Higher Education Committee members expressed a strong need for standardization, accreditation, and certification of OHS education and the OHS profession in BC's manufacturing industry. Higher Education Committee members emphasize the importance of robust standards, work-integrated learning activities, and program accreditation as means to standardize learning outcomes. OHS professionals echo these sentiments, emphasizing the Framework's role in continuous professional development, recognizing sector-specific needs, and appreciating the importance of existing certifications. The proposed Framework is seen as a pivotal tool in enhancing consistency, clarity, and professionalism within the OHS field, ultimately contributing to improved worker health, safety, and wellness. These findings demonstrate a widespread recognition of the need for standardization, accreditation, and certification within British Columbia's manufacturing profession.

Relevant Findings:

- Higher Education Committee members
  - indicated that there is a strong need to adopt a standardized framework and develop training accreditation and professional certification for OHS profession in BC manufacturing industry
  - noted that robust standards, such as those by Dr. Norma McRae, exist to ensure educational programs achieve desired outcomes in workplace skills and competencies
  - stressed the importance of ensuring that programs include meaningful and robust standards for assessing students' competency during work-integrated learning
  - believe there is great value in micro-credentialing programs but stressed the importance of making sure these programs align with the overall accreditation and regulatory framework to maintain standardization
  - indicated that standards set by the Ministry of Post-Secondary Education and Future Skills and other regulatory bodies are crucial in this regard as they work to ensure minimum educational quality
  - identified accreditation as one effective strategy to standardize OHS learning outcomes
  - noted that while voluntary accreditation can be advantageous, the introduction of a regulatory accreditation mechanism is deemed the most effective for ensuring consistent educational standards
  - would like to see an accreditation system for OHS educational programs, like models used by organizations such as the Council on Education for Public Health and the Accreditation Board for Engineering and Technology established
  - said they would like to see collaboration with stakeholders so that accreditation efforts with Canadian-based standards and the OHS Competency Framework are aligned.
  - noted that importance of ensuring that accreditation includes various program types (diploma, degree, etc.) to cater to the diversity of OHS programs

  - would like to see more collaboration between educational institutions, employers, OHS professional associations, and accreditation bodies fostered to develop and maintain standardized learning outcomes
  - believe that addressing standardization challenges is important and can be achieved by defining the competencies expected from graduates of different OHS programs
  - would like to see more collaboration with certification bodies and industry associations to ensure that educational outcomes align with certification requirements
  - cited that value of regularly reviewing and updating competency standards based on industry feedback and evolving practices
  - described how graduates from different programs have varying levels of competencies in various disciplines within the broad OHS field and that varying scopes of practice/competencies are significant complications when it comes to achieving necessary standardization
  - strongly advocate for a top-down, standardized approach to build accredited work-integrated learning programs in OHS
- OHS professionals that responded to the one-month post follow-up surveys believe that there is a need for developing professional certification for those working in the industry (62%), creating an accreditation program for educators and trainers (61%), and adopting a standardized Competency Framework (54%)
- Specific needs highlighted by OHS professional are as follows:
  - Need for Standardization in OHS Industry: The industry's call for a standardized Competency Framework underscores the necessity for clarity and consistency in Occupational Health and Safety (OHS). This initiative aims to establish national standards for competencies and training, ensuring uniform qualifications and fostering a consistent career pathway in OHS. The move towards standardization is critical for verifying the effectiveness of training programs and establishing recognized competency standards, thereby elevating the overall quality and reliability of the OHS industry.
  - Continuous Professional Development and Objective Assessment: The proposed framework is integral for facilitating continuous professional development and self-assessment among OHS professionals. This is particularly vital in keeping pace with regularly updated government regulations in the field. The incorporation of objective assessment tools within the framework is crucial, as it allows for the identification of areas needing improvement and ensures that competencies remain current and relevant.
  - Balancing Diverse Sector Requirements with Industry Needs: While the push for standardization is strong, OHS professionals recognize the challenges posed by the diversity of sectors within the industry. The suggestion to introduce sector-specific certifications aims to establish relevant benchmarks tailored to different fields. There's also an awareness of the need to balance the roles of industry associations and educational institutions in claiming accreditation rights, ensuring a comprehensive and inclusive approach.
  - Recognition of Existing Certifications: OHS professionals acknowledge the existence and relevance of current health and safety certifications, such as CRST and CRSP, particularly in the manufacturing sector. These certifications serve as examples of the effectiveness of a standardized approach, highlighting their importance in the industry and reinforcing the need for a unified competency framework.

- Standardization of Knowledge and Skills: The standardization of knowledge and skills is seen as pivotal in improving baseline understanding and achieving harmonization in what constitutes an OHS Professional. It enhances industry knowledge, offers a guiding framework in a diverse industry, and ensures the delivery of relevant and valuable training. The framework is also essential in bridging the gap between educational curricula and industry requirements, offering a systematic way to assess training and competencies.
- Professional Development and Competency Assurance: The framework is recognized for its significant role in professional development. It aids OHS Professionals in identifying knowledge and skill gaps and ensures that training programs align with competency requirements. This extends to aiding organizations in making informed hiring decisions, thus enhancing the overall professionalism within the OHS field.
- Consistency and Clarity in Practice and Hiring: A major benefit of the framework is the consistency and clarity it brings to the practice of OHS Professionals. This includes standardizing approaches in hiring, service delivery, remuneration, and professional development. It also provides clear guidelines for both employers and professionals regarding qualifications, expertise, and opportunities for improvement.
- Promoting Professionalism and Setting National Standards: The development of the framework is viewed as a crucial step towards fully professionalizing OHS practitioners. It aims to establish clear and consistent national standards, which is vital for building confidence in the OHS profession among industry stakeholders, government entities, workers, and the public.
- Enhancing Worker Health, Safety, and Wellness: There is a strong belief that standardization will lead to significant improvements in worker health, safety, and wellness. By ensuring that both new entrants to the profession and employers hiring OHS Professionals are equipped with necessary, industry-specific competencies, the framework aims to elevate the effectiveness and impact of the OHS field.

Question Two

Was the design of this project appropriate given the intended long-term and ultimate outcomes of the project?

Five key outputs were delivered during this project: the environmental scan, Framework II, the Curriculum Alignment Framework Report, the Competency Assessment Tool, and the Needs Assessment Tool.

The project aimed to improve the education and training system for the manufacturing sector, by developing and implementing a Competency Framework and conducting an inter-institutional comparison of existing OHS curricula. The project involved various stakeholders from the sector and disseminated its results throughout the manufacturing sector. Overall, the project was designed to achieve the long-term and ultimate outcomes of enhancing the quality and relevance of the education and training system and meeting the needs of the sector and the labour market.

Relevant Findings

- The design of this project was appropriate given the intended long-term and ultimate outcomes of the project, as it aimed to improve the quality and relevance of the OHS education and training system for the manufacturing sector
- The project developed a Competency Framework that defined the knowledge, skills and abilities required for OHS professionals in the manufacturing sector, based on the integration of two international frameworks (IOSH and INSHPO) and the addition of specific competencies

that were essential for the OHS practitioner role. The Competency Framework was also aligned with national-level frameworks and labour market needs
- The project provided the conduit for bringing together the key parties involved in the manufacturing sector, including representatives from higher education institutions, employers, professional associations, and regulatory bodies, and facilitated their collaboration and dialogue
- The project was able to compare the existing curricula to Framework II and identify the gaps and areas for improvement. However, the project did not define a mechanism for updating curricula, as it required further research on a model that addresses accreditation oversight
- The project created momentum and commitment for the implementation of Framework II and the revised curricula, and for the continuous improvement of the education and training system for the sector

Question Three

What has been the level of stakeholder participation in the project?

This project involved the collaboration of various stakeholders within British Columbia's manufacturing, post-secondary education, regulatory, and government sectors. The Alliance led an initiative to collaboratively develop and implement their competency framework through engaging with the relevant bodies regularly. The Steering Committee provided overarching strategic direction, and the Advisory Committee contributed essential recommendations in developing Framework II. The Higher Education Committee, representing academic interests, facilitated the integration of standards into curricula and program accreditation. Financial support and strategic partnership from the Ministry of Post-Secondary Education and Future Skills further underscored the collaborative nature of the project. As a result, the evaluation affirms that this project set a precedent for effective cross-sector collaboration in enhancing OHS practices in the manufacturing sector of British Columbia.

Relevant Findings

- The Steering Committee was established in 2015 and consisted of 11 representatives from industry, education, regulatory, and government in British Columbia. It provided consistent direction and decision-making throughout the project phases
- The Advisory Committee was selected from a subject matter expert population and consisted of 12 representatives from industry and education. It provided recommendations for the thresholds of competence required to work effectively as an OHS practitioner in the manufacturing sector
- The Higher Education Committee was composed of 10 members, including five representatives from post-secondary education institutions, one Association member, two members representing OHS certification bodies (CRSP, IOSH, and INSHPO), one Executive level member, and one OHS practicing professional. The Committee provided recommendations on implementing Steering Committee directives from a higher education perspective
- Subject matter experts and members of the Steering Committee, Advisory Committee, and Higher Education Committee expressed a high level of familiarity with the work being carried out during this project
- Subject matter experts and members of the Steering Committee, Advisory Committee, and Higher Education Committee were intimately involved in the project's development and implementation contributing to the development of the competency framework, tools, and alignment reports
- 51 unique individuals created profiles to pilot test the Competency Assessment Tool and 38 of these individuals generated a report

- 18 unique individuals created profiles to pilot test the Needs Assessment Tool

Question Four

Are users satisfied with the web tools and the resulting outputs? How have the outputs of these tools been used by employers and OHS professionals?

Survey results show that the Competency Assessment Tool is a useful and relevant tool for OHS professionals who want to evaluate their skills and knowledge, identify their strengths and weaknesses, and plan their professional development. The respondents used the Competency Assessment Tool for various reasons, such as self-assessment, curiosity, and career advancement. They also suggested several ways to make further use of the report produced by the tool, such as performance benchmarking, educational planning, and talent evaluation. The respondents were mostly satisfied with their experience using the Competency Assessment Tool and expressed a need for the tool in the OHS field. They also indicated that they are likely to recommend the tool to others.

Survey results also show that the Needs Assessment Tool is a satisfactory and useful tool for employers who want to create job profiles for their OHS positions. The respondents used the tool for various purposes, such as hiring, training, and benchmarking. They also identified several factors that influenced their satisfaction levels, such as usability, errors, detail, and relevance. The respondents felt that there is a need for the tool in the OHS field and that they are likely to recommend the tool to others.

Relevant Findings: Post-Use Competency Assessment Tool Survey

- Twenty-five OHS professionals responded to the immediate post-completion survey
- Respondents commonly chose to use the Competency Assessment Tool to complete a self-assessment (44%) and because they were curious about the tool (40%)
- Two-thirds of the respondents (68%) felt that the report was useful
- Respondents indicated that the report is useful because of its ability to:
    - Highlight areas for personal and professional development
    - Offer educational resources to enhance skill sets
    - Provide a comprehensive overview of competencies, aiding in self-assessment
    - Help professionals understand the current knowledge requirements for OHS
    - Identify strengths and weaknesses, which can be used to build more capacity in certain areas
    - Offer specific insights into OHS aspects that need attention for individual professionals
    - Present a clear and easy-to-follow summary of safety skills needed for proper evaluation of OHS competency
    - Clarify the roles, responsibilities, and necessary skills and knowledge for an OHS professional through a detailed framework
- About half (55%) of the respondents felt the report was relevant to their position
- Most respondents indicated that they would (38%) or possibly would (52%) make further use of the report produced by the self-assessment tool
- Those who indicated a likelihood of using the self-assessment report again suggested several ways they might utilize the report, including:
    - Professional Advancement: Utilizing the report to identify professional development opportunities, set competency goals, and share strategies with colleagues for reaching desired levels of expertise
    - Educational Planning: Guiding future education and training decisions to address knowledge gaps and strengthen OHS expertise

    - Performance Benchmarking: Comparing successive reports to track improvement in OHS knowledge and skills over time
    - Training and Audits: Updating training matrices and preparing for important audits by highlighting areas needing development
    - Career Tools: Enhancing resumes and promoting the assessment's benefits to peers and clients, as well as clarifying how to apply the tool's recommendations
    - Talent Evaluation: Assessing competencies of current and future H&S staff to identify gaps and inform hiring decisions
- Most respondents (73%) were satisfied with their experience using the tool
- Almost all respondents (95%) see some need for the Competency Assessment Tool, with 41% deeming it important and 23% considering it a major need
- Those who expressed that the tool is of important or major need highlighted the following reasons for its necessity:
    - Self-Reflection and Professional Assessment: It offers a quick and efficient means for OHS professionals to reflect on and evaluate their current standing in their career
    - Career Development and Integration: The potential to use the tool for job applications, career advancement, and integration with professional networking platforms, enhancing visibility and opportunities
    - Continuous Improvement and Current Knowledge: The tool aids OHS professionals in staying updated and improving their skills and knowledge
    - Standardization of Skills and Practices: It addresses the need for a standardized method to assess and compare skills within the OHS field
    - Objective Hiring and Skill Evaluation: Employers can use the tool to objectively evaluate the skills of OHS professionals, moving beyond mere academic qualifications
    - Identification of Strengths and Improvement Areas: The tool helps professionals identify their strong points and areas where they need further development, aligning with organizational objectives and growth goals
- Most respondents (64%) indicated that they are likely to recommend the tool to others

Relevant Findings: One Month Follow-Up Competency Assessment Tool Survey

- Sixteen OHS professionals responded to the one-month post follow-up survey
- Respondents reported that the Competency Assessment Tool helped them better understand their areas of strengths (82%) and identify areas where they could improve their skills (73%) as well as identifying professional development opportunities (64%)
- Nearly three-quarters of respondents (73%) felt that the report was useful to them
- Respondents indicated that the report was useful in several ways:
    - Self-Assessment and Awareness: The tool was highly effective in enabling respondents to self-assess their competencies. Many highlighted its utility in making them cognizant of their weaker areas, strengths, and overall skill/knowledge levels, particularly in the field of OHS
    - Professional Development Planning: The assessment tool played a significant role in aiding respondents in planning their professional development. It helped some in crafting a professional development roadmap by identifying knowledge gaps and areas requiring enhancement
    - Understanding Scope and Learning Needs: Responses indicated that the tool was useful in expanding their understanding of the scope of safety programs. It helped highlight the extent of learning and development needed in their respective fields

    - Benchmarking and Reflective Practice: Several respondents used the tool as a benchmark to evaluate their professional competencies against standard levels. This reflective practice provided insights into their current abilities and areas for growth
- Respondents suggested several areas for improvement including:
    - Clarity and Relevance of Criteria: Some respondents felt that the criteria descriptions did not align well with actual competencies. There was a suggestion for more precise and relevant competency descriptions to enhance the tool's usefulness
    - Simplification and Conciseness: A need for a more concise format was expressed, suggesting that a streamlined and straightforward approach could improve the tool's effectiveness
    - User-Friendly Layout and Navigation: Issues were noted regarding the complexity of the layout and difficulty in navigation. Respondents suggested improvements in the design for better user experience
    - Detailed and Comprehensive Reporting: There was feedback on the inadequacy of the report generated after the assessment, with some respondents desiring more comprehensive reporting of their competencies
    - Inclusion of Practical Elements and Application Guidance: Respondents suggested the inclusion of case studies in the assessment tool to make it more practical and applicable in real-world scenarios. Additionally, there was a request for more content on how the tool could be utilized to demonstrate value to employers
    - Tailored Tool Experience: Respondents proposed a more customizable experience of the NAT, suggesting that certain tool components, such as sections on cybersecurity or mental health, might not be relevant for all employers. Some employers requested the ability to more easily customize tool's content of different Framework sections based on their organization's structure and role relevance

Relevant Findings: Post-Use Needs Assessment Tool Survey

- Nine employers responded to a post-user survey
- Most respondents (78%) produced a job profile
- Most respondents (76%) expressed satisfaction with the tool
- When asked for details about their satisfaction levels, respondents identified several factors:
    - Usability and User Experience: Respondents found the tool easy to use and detailed
    - Errors and Improvements: Some respondents pointed out errors like spelling mistakes
    - Detail and Complexity: While some appreciated the level of detail, others found it too complex or repetitive. There was also mention of a need for more definition on certain topics
    - Relevance and Applicability: Some respondents felt that the tool might be more applicable in larger organizations or highly regulated industries, while others were not sure how it would be used as a hiring tool
- Most respondents (86%) felt that there is a need for the tool
- Most respondents (86%) indicated that they are at least somewhat likely to recommend the tool to others

Relevant Findings: One Month Follow-Up Needs Assessment Tool Survey

- Four employers responded to the survey
- One employer indicated that they did not use the job profile that they generated using the Needs Assessment Tool as they were using the tool for review purposes only, while the three that did used the profile to develop a job description for an OHS position, assess prospective

OHS Professionals, inform development of a job posting, and identify gaps in current employee skillsets

- Of the three employers who used the profile, all three indicated that it was useful. When asked to elaborate, respondents found that the thoroughness of the profile clarified the necessary qualifications and roles necessary for a safety professional and how well qualified candidates would bring value to their organization
- When asked how the tool could be improved, one employer said they appreciated the tool's outline but suggested enhancing its utility by allowing users to prioritize categories for grading individual candidates according to an organization's needs. Another found the tool somewhat overwhelming due to its extensive coverage of data. Additionally, there was a concern about the tool's practicality for employers, particularly in crafting job postings or descriptions, due to the vast amount of subject matter it encompassed
- All four employers indicated a need for the Job Profiling Tool. When asked to elaborate, one employer said that the tool is a perfect outline for companies to ensure they understand the competencies of each candidate and what development needs they have; two employers who indicated there was somewhat of a need because they felt that the competencies of an OHS Professional are determined by the audit certification program, and that the current "exhaustive list of tasks" may not be necessary. They also noted that they may not need to use the tool often because of low turnover at their organization

Question Five

Is Framework II and thresholds supported by educators and trainers and industry? Is it increasing understanding and agreement on the definition of an OHS Professional and the required competencies?

The evaluation findings indicate that Framework II, designed to delineate and define the skills and knowledge of OHS professionals, enjoys support from educators, trainers, and industry stakeholders. Feedback from HEC members and the Advisory Committee suggests a generally positive reception, with acknowledgment of its utility in describing and assessing OHS-relevant job competencies. Suggestions for improvement emphasize the need for the Framework to adapt to changes in the OHS field through conducting regular reviews. The revisions made between the first- and second-edition Framework were successful in enhancing the document's clarity, eliminate inconsistencies, and improve its usability by the target audiences. Notably, the inclusion of entry-level expectations through the competency profile and the integration of physical and psychological health aspects showcases an effort to comprehensively address OHS needs. From this, the evaluation identified that the Framework could be used as a foundation for addressing curriculum gaps within OHS educational programs and for informing a top-down approach to organize the OHS profession through fostering collaboration among post-secondary institutions, employers, and professional associations.

Relevant Findings

- Higher Education Committee members firmly support Framework II but stressed that the framework should evolve to ensure that it remains relevant to OHS professionals
- Higher Education Committee members noted that the OHS field is dynamic and ever-changing so Framework II and its accompanying profile should be adaptable to changes in the field
- Higher Education Committee members believed that finalizing revisions to Framework II and its accompanying profile should be a primary focus as the project continues to advance. The original strategy envisioned an evolving certification and accreditation process, necessitating

regular reviews of the framework to stay current with evolving risks in the manufacturing industry

- Key opportunities for improvement to Framework II identified were resolving inconsistencies in key terms, eliminating organizational inconsistencies, and establishing reasonable competence levels for entry-level OHS professionals
- Feedback from the subject matter experts and Advisory Committee was incorporated into a revised version of Framework II in June 2023. These changes include the following elements:
    - Enhanced Clarity: Each unit in the framework was designed to describe a competency, list relevant knowledge and skills, and detail a path toward developing proficiency. Every unit describes a single competency, eliminating repetition, unnecessary complexity, and ensuring appropriate use of terms
    - Improved Usability: Each unit was enhanced to be usable for various applications, including recruiting OHS professionals, ongoing professional development, and curriculum design
- Overall, the subject matter experts and Advisory Committee found the updated framework to be clearer and more concise than the original version while retaining key content
- Subject matter experts believed the profile levels recommended in the new framework aligned with the expectations for entry-level OHS professionals
- Adjustments related to physical and psychological health were better aligned with the Advisory Committee's expectations
- Strong belief exists that Framework II and profile should be used as a foundation for identifying new content and addressing curriculum gaps in OHS educational programs
- Regular updates to curriculum are needed based on Framework II to ensure alignment with current industry needs
- HEC members strongly advocated for a top-down, standardized approach to build accredited work-integrated learning programs in OHS. This approach, informed by Framework II, was considered essential for fostering collaboration among educational institutions, employers, and OHS professional associations
- OHS professionals who provided input during interviews were in favour of having a standardized Competency Framework, professional certification, and training accreditation for the OHS profession in the BC manufacturing industry for the following reasons:
    - Clarity and Competency Assurance in Hiring: OHS professionals emphasized the need for clarity and confidence in the hiring process. A standardized framework helps to ensure that practitioners and industry employers have a clear understanding of the required competencies, addressing current issues of cohesion and inconsistency in professional skill levels. This leads to greater assurance in the competency of hired OHS professionals, especially regarding their industry-specific expertise
    - Professional Development and Industry Adaptability: The framework is seen as beneficial for professional development, helping practitioners identify and fill gaps in their knowledge and skills. Additionally, its adaptability to accommodate the diverse needs of different manufacturing sectors is highlighted, ensuring relevance across the industry
    - Improvement of Industry Standards and Impact: There is a strong belief that standardization will lead to an overall improvement in industry knowledge, professionalism, and the ability of OHS professionals to effect necessary changes. This includes a focus on in-depth training in areas like human and organizational behaviour, enhancing the value and impact of OHS professionals in the industry
    - Consistency and Quality Assurance in Professional Practice: Standardization is viewed as a key to creating consistency in the skills and knowledge of OHS professionals,

underpinning their professionalism and assuring quality in their work. This consistency is crucial for organizations to operate safely, healthily, and in compliance with regulations

Question Six

Has recognition of the need for and benefits of program accreditation and professional certification increased?

There is a significant amount of support and positive recognition about the benefits of program accreditation and certification processes. Setting clear standards for OHS professionals and educators in British Columbia, particularly in the manufacturing industry, was of the utmost importance to the Higher Education Committee members. The evaluation plan used the environmental scan to validate these perspectives; through this, the evaluation found that the project highlighted a pressing need for enhanced certification processes for OHS professionals in British Columbia, coupled with a necessity to redefine the purpose and value of certification for the different audiences in the OHS community. Furthermore, project stakeholders recognized the current diversity within OHS programs and certifications in the provinces, however they also brought attention to meaningful gaps in the covered knowledge and skills within existing OHS programs, indicating a need for targeted improvements. To address these challenges effectively, the project identified that collaboration between professional organizations and industry associations was imperative in aligning educational outcomes with industry expectation.

Relevant Findings

- OHS professionals who provided input during interviews expressed that significant progress has be made in increasing recognition of the benefits of program accreditation and processional certification
- Key factors contributing to this progress were identified:
    - Active solicitation of feedback from various stakeholder groups has been a beneficial factor in the development of the project
    - The use of online meetings was helpful in maintaining momentum despite the challenges posed by the COVID-19 pandemic
    - The ongoing review process and the involvement of a diversity of experts contributed positively, although there was an assumption of shared knowledge which may not have always been the case
    - Broad, consistent, and transparent discussions led by ethical professionals were seen as drivers of progress
    - There was strong consensus among committee and group members, and the quality of research from the Alliance, along with the deep experience of those involved in design and development, was highlighted
    - The staff at the Alliance was credited with having the capacity to facilitate the process effectively and to complete necessary background work
- Higher Education Committee members commented that the introduction of regulatory accreditation is seen as critical for ensuring that all educational institutions offering OHS programs meet and maintain OHS educational standards
- Evidence from the environmental scan conducted underscores the need for enhanced certification processes for OHS professionals in British Columbia, particularly in the manufacturing industry
- Evidence from the environmental scan suggests that reframing the purpose of certification processes, emphasizing the value of certification to OHS professional growth and

development, would make these process more palatable with employers, educators, and OHS professionals
- Higher Education Committee members commented about the importance of having certified OHS program instructors in place when developing the next generation of OHS professionals. Having certified educators improves the quality of the educational experience for upcoming OHS professionals and leads to the development of stronger OHS workforce
- Higher Education Committee members believed that it is important to acknowledge that there is a great deal of diversity in OHS programs and that certifications mirror the diversity of professional and practitioner certifications in OHS. Regardless, certification is crucial
- Higher Education Committee members noted that despite reasonable alignment in present OHS certifications, meaningful gaps in covered knowledge and skills are present
- Higher Education Committee members indicated that is important to collaborate with certification bodies and industry associations to align educational outcomes with certification requirements. The value of certifications in the OHS professional makes this imperative

Question Seven

Are educators and trainers considering or planning to incorporate Framework II and thresholds into their curricula? What further work is required to advance these incorporations?

The Higher Education Committee members have used Framework II as a guide to identify and address gaps in their OHS educational programs. They have also consulted peer-reviewed literature and industry feedback to design new courses that cover various skills and topics relevant to the OHS field. They have emphasized the importance of work-integrated learning, communication, technical writing, project planning, leadership, ethics, and interpersonal skills in their curriculum. They have also suggested that Framework II should be regularly reviewed and updated to reflect the changing needs of the OHS profession.

Relevant Findings

- Higher Education Committee members said that Framework II is a strong foundation to use when they are identifying new content and addressing curriculum gaps in their OHS educational programs
- Higher Education Committee members indicated that some educational institutions are in the process of designing new courses to address identified curriculum gaps
- The quantitative and qualitative curricula alignment work carried out during Framework II and profile improvement process has played a role in these educational institutions' work to design new courses
- Information from peer-reviewed literature examined during this process has also influenced educational institutions' efforts to design new courses
- Special emphasis has been on ensuring that comprehensive work-integrated learning, communication, technical writing, project planning, leadership, ethics, and various interpersonal skills (e.g., perspective taking) are part of the curriculum for these courses as they were identified to missing elements based on Framework II
- To advance this curriculum development work, Higher Education Committee members indicated that further work is needed in the following areas:
    - Enhanced Engagement and Compliance: Increase collaboration among educational institutions, industry groups, and political entities. This includes more frequent meetings with schools, ensuring industry groups recognize the value of the program, and engaging politically to guarantee certifying authorities are compliant with new standards

- Implementation and Evidence-Based Promotion: Focus on implementing the outcomes of the consultation process and commit to periodic reviews. Support these actions with targeted publicity using case studies that demonstrate the framework's benefits to both individuals and businesses
- Academic Content Revision and Stakeholder Engagement: Recognize that current academic OHS content may need updating to align with industry needs and 'fit for purpose, fit to practice' standards. Continue to engage with stakeholders to advance academic content and explore various assessment models, such as practicums and portfolios
- Regulatory Support and Professional Development: Seek political and governance support within BC Ministries to consider a statutory footing for OHS Professionals, aligned with a minimum academic degree level. Advocate for sector-specific postgraduate programs that support professional transitions between sectors
- Role of Higher Education Committee in Collaborative Improvement: Utilize the Higher Education Committee at the Alliance to foster collaboration among all OHS educational programs in the province. This committee can play a crucial role in integrating theory with practice and improving work-integrated learning opportunities through facilitated work placements

Question Eight

What unintended outcomes, positive or negative, can be attributed to the project?

The project had two positive unintended outcomes: one was the significant improvement of the competency framework, which became more comprehensive and robust; and the other was the opportunity to test the effectiveness of machine learning tools in comparing the curricula to the framework, which enabled a more efficient and accurate analysis and demonstrated the potential of artificial intelligence to support the quality assurance and enhancement of the education and training system.

Relevant Findings

- The project made significant improvements to the competency framework:
  - These improvements were made by a significant, unplanned increase in the effort and resources that were invested in its development than originally planned.
  - This additional investment was made at the recommendation of the Advisory Committee, and as approved by the Steering Committee, during the development of the competency profile
  - This resulted in a more comprehensive and robust product that reflected the current and future needs of the sector and the labour market
- This project tested the effectiveness of machine learning tools in comparing the existing and the proposed curricula to the competency framework
  - The project used a generative pre-trained transformer (GPT) to identify consistencies and differences between the contents of different course syllabi
  - This enabled a more efficient and accurate analysis of the gaps and areas for improvement and demonstrated the potential of machine learning tools to support the quality assurance and enhancement of the education and training system

Question Nine

Has the project been delivered as planned? In what manner and to what extent have the intended outputs been produced?

The project aimed to develop and validate a competency framework and profile for manufacturing specific OHS Professionals in BC, and to create free-to-use tools for assessing and improving their competency levels. The project also sought to communicate and engage with the project's stakeholders, and to pilot and evaluate the tools with industry representatives. The project achieved its expected outcomes, such as establishing the committees, developing the communications strategy, and delivering the tools. However, the project also faced some challenges and delays in developing the competency framework and the software, which affected the timeline and quality of the project. The project was unable to conduct the pilot testing in two phases and provided a limited quantity of referrals to resources for the OHS professionals. The committees formed played an instrumental role in the development and validation of the project deliverables, and in shaping the design of the communications strategy and the evaluation framework.

Relevant Findings

- The project set out to achieve the following outcomes:
    - To establish a project governance committee, a higher education subcommittee, and an advisory committee to oversee and validate the deliverables, and to assist with the creation and validation of a competency profile for manufacturing specific OHS professionals
    - To develop a communications strategy to inform and engage the project's stakeholders, and to recruit participants for the pilot testing components
    - To develop free-to-use tools for the British Columbian manufacturing sector to assess and improve the competency levels of OHS professionals and to help employers hire and train qualified OHS professionals
    - To pilot these tools with industry stakeholders that represent the diversity of the manufacturing sector in BC, and evaluate the tools' impact, uptake, and efficacy
- Each project goal was achieved prior to the development of this final evaluation report
- However, the project team faced some challenges and delays in developing the competency framework and the software, which affected the timeline and quality of the project
- The project team was unable to conduct the pilot testing in two phases as originally planned, and instead conducted one late phase in November, which limited the feedback and evaluation of the project
- The project team provided a limited number of referrals to resources that could help the OHS professionals improve their skills, as they felt it was not feasible given the current OHS courses available for this sector. Additionally, the project identified that the development of a micro-credentialling system may be initially helpful in popularizing the Framework across the target audiences, but the Higher Education Committee voiced concerns on whether a micro credentialling system could foster genuine alignment between different post-secondary institutions and sector employers
- The committees formed played an instrumental role in the development of the Competency Framework and profile as well as the Competency Assessment Tool and Needs Assessment Tool. Further these committees shaped the design of the communications strategy and the evaluation framework

Question Ten

What key factors have contributed to the success of the project? What have been the key obstacles to success? What have been the best practices and lessons learned from the project?

The success of the project can be attributed to effective governance, a comprehensive communications strategy, inclusive stakeholder engagement, a rigorous implementation process, and the development of valuable, free-to-use tools. On the other hand, obstacles such as personnel changes, delays, and challenges in stakeholder engagement sequence highlight areas for improvement in future projects.

Key Findings

- Key factors contributing to project success:
    - The formation of project governance, higher education subcommittee, and advisory committees helped provide oversight and/or validation of deliverables
    - The development of a robust communications strategy facilitated effective stakeholder engagement and successful recruitment for pilot testing components
    - Engaging a diverse audience of OHS professionals, employers, educational institutions, and regulatory bodies ensured a comprehensive and inclusive approach to project development
    - The team demonstrated a rigorous implementation process, collecting information steadily and incorporating evidence from peer-reviewed sources and stakeholder feedback to strengthen deliverables
    - The development of free-to-use tools for assessing and improving competency levels of OHS professionals addressed a specific need in the BC manufacturing sector
    - The team's commitment to building durable, sustainable, and flexible products, adaptable to changes, contributed to the project's overall success
- Despite challenges, the overall project process was positive, indicating effective problem-solving and resilience in overcoming obstacles
- One factor that slowed or prevented project success was unexpected challenges in the development of software for the web tools
- Another factor that slowed or prevented project success was refinements to Framework II which delayed the start of other project activities

Question Eleven

What are the recommended next steps to be taken towards achieving the intended longer-term outcomes of a standardized OHS Competency Framework for the manufacturing industry, accredited education programs, and an OHS professional certification program for manufacturing?

To ensure the long-term success of the developed Competency Framework and the integration of OHS professional certification into educational curriculum, the evaluation report recommends the following actions:

- Foster long-term relationships with key industry stakeholders, including manufacturing associations, regulatory bodies, and employers to ensure ongoing support and integration of Framework II within the manufacturing sector
- Continue to work with the relevant regulatory bodies and professional organizations towards supporting the OHS profession within British Columbia through establishing new organizational structures for ensuring the profession is practiced consistently and responsibly
- Establish long-term partnerships with educational institutions to embed Framework II into their curricula permanently and establish standards for OHS professional education
- Launch advocacy campaigns to raise public awareness about the importance of OHS standards and the value of Framework II. Engage in outreach efforts to ensure that these standards are recognized and endorsed by a broader audience

Sustainability Plan

Sustainability refers to an organization's ability to maintain or support some process or product continuously over time while working towards the long-term objectives of supporting the OHS profession. Within the context of this project, sustainability in the short-term seeks to ensure that the products developed throughout Phase IV-B can continue to exist and thrive beyond the expiration of the Alliance's current agreement with the SLMP. The medium- and long-term objectives will also be included in the plan that considers the further professionalization of the OHS profession through the development of a regulatory body.

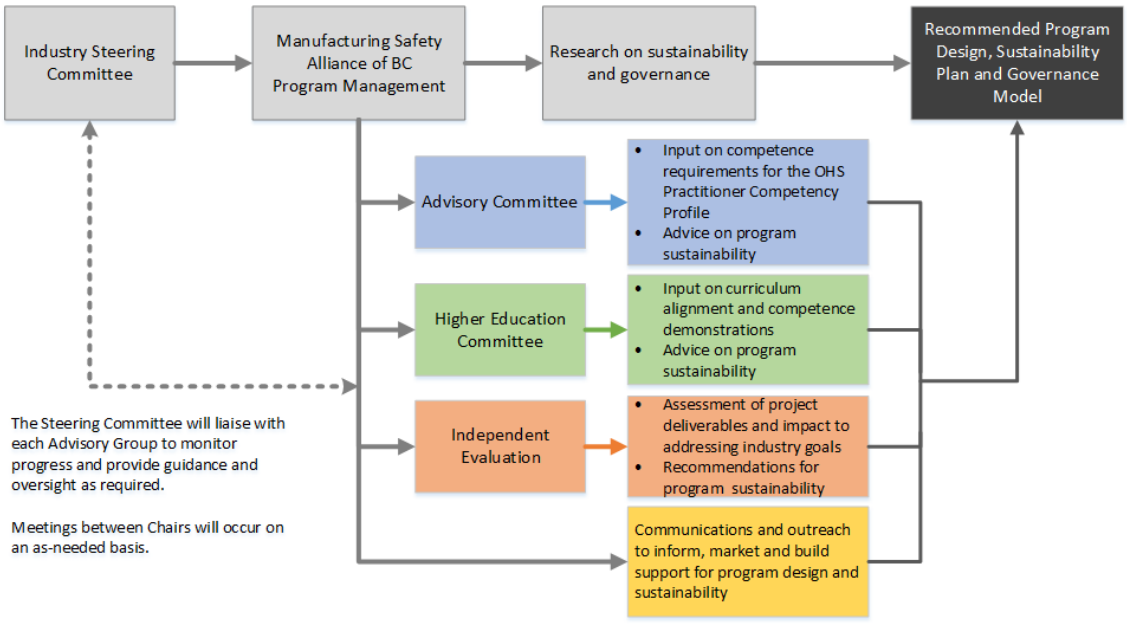
The Alliance maintains an organization-wide commitment to developing a sustainable approach towards helping its member organizations in their efforts to create a healthy and safe work environment. This includes a focus on promoting stakeholder engagement, developing new health and safety services and programs, and championing the ongoing development of the OHS profession for a healthier manufacturing future.

As Phase IV-B enters continued program status, the Alliance has worked to develop a path forward for the phase's products beyond the conclusion of this SLMP initiative. The Alliance regularly met with stakeholder groups throughout the initiative to discuss feedback from stakeholders, and in combination with the preliminary evaluation results. In December 2023, Steering Committee members endorsed a sustainability plan that would ensure the ongoing delivery of Phase IV's successful elements, ensuring that the Framework and related web tools be prepared for broad release in 2024.

CONSULTATION

Several stakeholders, shown in Figure 1, were involved in establishing this sustainability plan for Phase IV-B. This section explores each of their contributions.

FIGURE 2: PROGRAM DESIGN ORGANIZATIONAL CHART



Industry Steering Committee

The Industry Steering Committee serves as the primary approval and decision-making body for this project. Comprising of representatives from the manufacturing industry and experts in OHS, the Steering Committee played a crucial role in the development of the sustainability plan by regularly offering valuable input and direction on various aspects of product design and implementation. Their expertise provided unique insights into manufacturing-centered concerns related the OHS profession, guiding Phase IV in identifying objectives and opportunities for the program's future. Responsible for endorsing a sustainability plan aligned with the project's mission and communication strategy, the Steering Committee promoted continual quality assurance through regular meetings with the Alliance, where members provided valuable comments on each deliverable and its short- and long-term viability.

Sustainability Functions:

1. Offer consistent feedback and leadership, supporting the ongoing development and refinement of the sustainability plan
2. Promote quality assurance, ensuring that the program design accurately reflects industry needs and aligns with the vision, goals, and objectives outlined in the Strategic Plan
3. Provide strategic oversight through regular meetings and by assessing the progress of program and its ability to address key labor market issues related to OHS professionals in the manufacturing sector
4. Collaboratively engaging with other project bodies helped facilitate collaborative engagement to ensure a cohesive approach to sustainability planning and program development

Manufacturing Safety Alliance of BC

The Alliance was responsible for overseeing Phase IV-B through providing project management and research services. As the contract holder, the Alliance was the primary entity directing project resources, aligning deliverables with industry needs, and collaborating with the Ministry and the Steering Committee. The sustainability functions of the Alliance are multifaceted, including overall accountability to funding partners, oversight of program design and implementation, and promoting alignment with the manufacturing sector. To promote the ongoing success of the project, the Alliance also managed deliverable timelines, costs, and risks while leveraging its communication systems to build industry awareness and support for the program.

Sustainability Functions:

1. Provide overall project management and coordination.
2. Report and be accountable to funding partners and the Steering Committee.
3. Monitor and maintain deliverable timelines, budgets, and risk controls.
4. Provide oversight on the communications and outreach strategy.
5. Leverage funding sources to support program design and strategy implementation.
6. Finalize an organizational model to successfully implement and manage the program on an ongoing basis.

Advisory Groups

Advisory Committee and Subject Matter Experts

The Advisory Committee focussed primarily on ensuring the continued success of the OHS Competency Framework and Profile, and its associated web tools. The Advisory Committee represented a subset of the 35 subject matter experts (see Appendix B) that were engaged throughout the development of the

Framework and its web tools. The experts represented an impressive body of knowledge and decades of experiences with working inside the OHS profession as professionals, or as researchers in safety science. The Advisory Committee guided the subject matter experts' feedback into focussed advice on the necessary revisions and additions to the Framework that would ensure that industry-specific needs were addressed by the products. The committee met regularly with the Alliance throughout the project, and joined other non-member OHS experts to contribute to the creation of products that would be easy to maintain throughout changes to both the OHS profession and to manufacturing work within British Columbia.

Sustainability Functions:

1. Ensure industry-specific needs are addressed in the design of the OHS Competency Framework and Profile
2. Provide input on sustainability requirements across each domain of the OHS profession
3. Offer regular updates and status reports to the Alliance and Steering Committee
4. Recommend sustainability management methods to ensure the ongoing viability of the Framework and web tools

Higher Education Committee

The Higher Education Committee (see Appendix C) played a vital role in incorporating education-specific insight into the sustainability planning for this project. Through group meetings and individual sessions, the committee members provided input on how to best align OHS educational program curricula across the province, and how to promote the Framework's uptake across different educational institutions. The committee composition included representatives from higher educational institutions, industry representation, and several members from national and international OHS professional organizations.

Sustainability Functions:

1. Integrate education-specific concerns into sustainability planning for Phase IV's products
2. Gather input on the merits and methods for promoting alignment across OHS educational program curricula
3. Provide regular comments on the methods and results of the curriculum alignment framework
4. Make recommendations on how to promote the Framework's uptake across education institutions

Vision for Ongoing Product Delivery

The OHS Competency Framework and Profile (Framework II) and its accompanying web tools will help prepare the OHS profession for standardization through the following actions:

- The Alliance will be responsible for maintenance of the OHS Competency Framework and Profile through forming a technical committee responsible for ensuring the Framework remains up to date with modern OHS practice
- The Alliance will continue to work with its contractors to address the results of the web tools' evaluation before their release to the public, and will maintain these relationships to ensure the continual maintenance of their web infrastructure
- The Alliance will engage with its member-organizations, higher educational institutions, and OHS professionals to ensure all audiences are aware of the Framework's and the web tools' availability and purpose
- The Alliance will engage with the Province of British Columbia and with OHS professional bodies to champion the development of a professional governance structure for the OHS profession

SUCCESSFUL ELEMENTS TO BE MAINTAINED

The following are the successful elements of the project that were identified and approved by the Steering Committee to be maintained beyond the end of this SLMP initiative.

The OHS Competency Framework and Profile

The Steering Committee were provided regular updates on the development of the OHS Framework and Profile, which included feedback from the Advisory Committee and the subject matter experts. When presented with the completed Framework II, the committee agreed that the new document provided a full picture of the range of competencies that are required for an OHS professional practicing within British Columbia. Acknowledging the Advisory Committee's recommendation that the document be adopted as a standardized description of the OHS profession, the Steering Committee agreed that the continual monitoring and maintenance of the Framework would allow it to serve as an effective resource for OHS professionals, employers, and higher educational institutions.

SUSTAINABILITY CONSIDERATIONS

These considerations were found to be relevant to the Alliance's ability to ensure the sustained success of Framework II.

1. **Risk of Obsolescence.** The OHS profession is not static; it constantly responds to shifts in regulations, workplace dynamics, and societal expectations. The dynamic nature of the OHS profession necessitates professionals to concurrently navigate evolving regulatory landscapes, harness experiential knowledge, and employ creativity to proactively address emerging challenges, thereby reinforcing their pivotal role in enhancing workplace safety and health. It follows, then, that a competency framework for the OHS profession would need to adapt to these emerging changes. If Framework II were to fall out of pace with modern OHS practice, the document would likely lose relevance and, eventually, be abandoned by its target audiences.
2. **Presence of Competitive Forces.** Phase III identified several market forces that could inhibit the uptake of Phase IV-B's products. One key force is the existence of many different products released by other institutions that purport to perform the same function as Framework II. Nationally, this includes the Board of Canadian Registered Safety Professionals' (BCRSPs) competency profiles, which they use to build their examinations. At the international level, the British Institution of Occupational Safety and Health (IOSH) maintains its own competency framework, along with the International Network of Safety and Health Professional Organisation's (INSHPO) capability framework. Similar products that purport to describe the scope of the OHS profession and the level of competence required to practice the profession responsibly have been under development by both national and international organizations for several years. The success of the OHS Competency Framework and Profile depends on the Alliance establishing a mechanism to apply the Framework's unique and comprehensive approach to ensure OHS professionals possess the competencies necessary to practice the profession within British Columbia.

Web Tools for OHS Professionals and OHS Employers

Throughout the development of web tools catering to OHS professionals, the Steering Committee actively contributed insights on optimizing their utility for both professionals and employers. During the internal beta test and pilot launch phases, the Alliance collaborated closely with contractors to gather, present, and act on user feedback. The Steering Committee emphasized the tools' significance for

advancing the OHS profession and urged the Alliance to establish processes for regular integration of user feedback.

Sustainability Considerations

These factors significantly impact the Alliance's ability to ensure the prolonged success of the web tools:

1. **Continuous Improvement**: Feedback underscored the necessity for ongoing development, including simplifying assessment tools, clarifying scoring criteria, and reducing assessment length. Regular updates, informed by present and future user feedback, will maintain alignment with the evolving OHS landscape, ensuring ongoing significance and effectiveness. Establishing mechanisms for continuous integration of user feedback is crucial for sustained success
2. **Maintenance Requirements**: Proactive website maintenance is imperative to ensure continued success. Regular checks, updates, and patches must be applied to address vulnerabilities, prevent downtime, and enhance overall system reliability. Integrating the web tools within the Alliance's existing web infrastructure will mitigate user impact during potential outages or malfunctions

Engagement and Outreach

The successes of Phase IV underscore the importance of effectively promoting the project to the targeted audiences. The Alliance recognizes that sustainable success relies not only on the quality of its programs but also on the engagement and support of key stakeholders. As such, the Steering Committee were adamant that the Alliance should continue to foster continued participation of the manufacturing sector, OHS professionals, higher educational institutions, and other stakeholders in the maintenance of Phase IV's products. The Steering Committee also advised continuing engagement with other health and safety certifying organizations, such as BCRSP and IOSH, to explore opportunities for product expansion beyond the manufacturing sector.

Sustainability Considerations

1. **Risk of Stakeholder Apathy.** The Curriculum Alignment Report highlighted that several higher educational institutions may be overwhelmed by the number of competing competency frameworks within the OHS profession. The Higher Education Committee recognizes that the Framework presents an opportunity to help post-secondary institutions identify curricular gaps in their OHS programs. However, given the non-negligible resource and time investment associated with aligning an educational program with an accreditation structure, it is likely that future initiatives to develop an accreditation system for OHS programs would encounter some institutional resistance. Similarly, employers and OHS professionals have expressed fatigue at the number of certification programmes available for the OHS profession. To avoid apathy within the stakeholders involved within this initiative, the Alliance should work to promote the unique value of this initiative for the OHS profession and plan to establish the Framework as a key document within its future projects with the OHS community.
2. **Opportunity for Intra-Sector Outreach.** Framework II contains sections that were designed to be relevant to all British Columbian OHS professionals regardless of what sectors they work within. Through effective communication, this can allow the Alliance to transparently convey the benefits and value of this project to OHS professionals and employers outside of the manufacturing sector. By adopting messaging that can be used across sectors, such as by stressing the value of professional development tools and standardization for the profession, the Alliance can garner widespread support for the long-term success and sustainability of the project's products beyond Phase IV.

Professionalization of the OHS Profession

Professionalization is the process by which an occupation or field evolves from being a collection of individuals with varied backgrounds to a recognized and organized profession. It involves the establishment of specific knowledge, skills, ethical standards, and accreditation criteria unique to that profession. Across the Steering Committee, the Advisory Committee, and the Higher Education Committee, it was agreed upon that the professionalization of the OHS profession is a strategic imperative for fostering a culture of safety and well-being in workplaces. Given this, the Alliance is confident that the development of stronger structures and systems into the OHS profession would help make British Columbia a safer place to work.

SUSTAINABILITY CONSIDERATIONS

1. **Risk of Poor Professional Practice.** The primary function of the OHS profession is to reduce harm to workers. OHS professionals do this through the careful application of knowledge elements, such as knowing models of incident causation, and skill elements, such as performing an inspection of safety equipment. The Alliance's Phase II Labour Market Information Research Report demonstrated that 74% of organizations who employ OHS professionals experienced an increase in safety performance; however, this research also demonstrated that organizations were reluctant to hire professionals who were not obviously qualified and experienced. The responsible practice of the OHS profession can, at minimum, mitigate the risks of damage to their property and injury or death to workers. From this, the Steering Committee believes that poor OHS professional practice presents an unacceptable hazard to everyone within a workplace.
2. **Opportunity to Address Stakeholder Need.** Across all committees and project activities, OHS professionals and sector employers expressed a desire for clear and consistent professional standards. The strongest method to address this need would be to establish a regulatory body for the OHS profession: Such bodies are granted the authority to set and maintain standards of practice and to oversee investigation and disciplinary procedures. In British Columbia, a profession can petition the Minister of Post-Secondary Education and Future Skills to form its own regulatory body under the *Professional Governance Act* (the Act). The Steering Committee has found that this legislation presents a vital opportunity to ensure the continued success of the OHS profession.

SUSTAINABILITY ACTION PLAN

In identifying the successful elements of Phase IV-B, the Alliance and the Steering Committee have formed the following sustainability objectives and activities.

Ensure that Framework II Remains Relevant to Modern OHS Practice

The OHS profession operates in a dynamic environment characterized by evolving regulations, changing workplace dynamics, and shifting societal expectations. Framework II, developed with input from the Advisory Committee and subject matter experts, serves as a comprehensive description of the competencies required for OHS professionals in British Columbia. However, the dynamic nature of the profession necessitates ongoing monitoring and maintenance to adapt to emerging changes. Failure to keep pace with modern OHS practices poses the risk of obsolescence, diminishing the document's relevance and effectiveness. Recognizing the need for continual adaptation, the Steering Committee intends to designate a technical committee responsible for performing regular updates to the Framework to ensure the long-term adoption of the document.

This involves the following activities:

- **Establish the Technical Committee for the OHS Professional Competency Framework and Profile.** The Standards Council of Canada (SCC) advises that the development, approval, and maintenance of a standards documents should be performed by a technical committee with standard-relevant technical expertise. Given this, the Alliance will form a Technical Committee responsible for ensuring Framework II remains up to date with modern OHS practice. Per SCC guidance, this committee will be comprised of the following members:
    - A Chair, who reports to the CEO of the Alliance
    - Five "General Interest" members, with expertise in the technical contents of Framework II
    - At minimum three "Educational Interest" members, representing educational institutions offering OHS programs within British Columbia
    - Two "Organizational Interest" members, representing employers in the British Columbian manufacturing sector
    - One "Regulatory Interest" member, representing a national OHS professional organization
    - One "International Interest" member, representing an international OHS professional organization
    - Two "Professional Interest" members, representing currently practicing OHS professionals within BC
- **Implement a Consensus-Based Approach for Framework Revisions.** After the Technical Committee is formed, standing rules will be discussed and adopted to guide the committee's work. Following SCC recommendations, these rules will address the following points:
    - A schedule for when the Framework will be subject to a technical committee review
    - Procedures for the technical committee review, so that technical changes to the Framework are adopted through voting-based consensus
    - Procedures for leveraging the Alliance's marketing resources to ensure that the Framework's users are informed of changes

The Alliance is Committed to Evolving OHS Web Tools Based on User Feedback

As the Alliance prepares to launch its OHS Web Tools, a dedicated team is being assembled to guarantee their relevance and functionality in the future. Recognizing the Steering Committee's confidence in the tools' potential impact on the OHS profession, the Alliance, in collaboration with subcontractors, will incorporate user feedback from the pilot testing period into the tools. Beyond this initial feedback, integration within the Alliance's mature web infrastructure becomes pivotal for regular maintenance and leveraging existing connections to technical support resources. These aspects are not just technical requirements but strategic imperatives to adapt to the dynamic nature of the OHS profession.

This commitment involves specific activities:

- **Establishing a Continuous Improvement Mechanism**. The Alliance, alongside subcontractors, will address edits suggested by the pilot test survey throughout 2024 Q1-2. Simultaneously, procedures for gathering feedback from future users will be developed in collaboration with the marketing team and IT support contractors. The responsibility for regularly reviewing and implementing necessary edits to the Framework or the tools rests with the Chair of the Framework's technical committee and the Alliance's marketing team.

- **Implementing Proactive Web Tool Maintenance**. In 2024, the Alliance will integrate the web tools into its existing web infrastructure, benefiting from established procedures that include regular maintenance schedules, contingencies for preventing downtime, and overall enhancement of system reliability. This integration ensures increased reliability and availability for users.

The Alliance is Committed to Promoting the Availability and Usefulness of Framework II and the OHS Web Tools to All Stakeholders

Phase IV-B highlights the value of effective engagement and support from key stakeholders. Participation from the manufacturing sector, OHS professionals, educational institutions, and other stakeholders has underscored the need for the Alliance to continue to maintain and expand the reach of Phase IV's products. A consistent approach to communication and outreach, sensitive to competitive forces from other organizations and to insights from previous phases, is essential to ensure continued relevance and impact beyond Phase IV.

This involves the following activity:

- **Establish the Framework's uniqueness.** To counter competitive forces from other OHS professional competency frameworks, the Alliance will engage its marketing team to develop future messaging that establishes the uniqueness of Framework II. This campaign will strategically communicate the distinctive features of the Framework to key audiences, emphasizing these key elements that make the Alliance's Framework of value to OHS professionals, employers, and OHS educators:
    - **Framework II was built using input from OHS professionals, experts in safety science, and manufacturing employers.** This makes the Framework the most complete description of the scope of the OHS profession within BC's manufacturing sector, making it uniquely useful to professionals seeking to enter or improve their position within manufacturing organizations.
    - **Framework II establishes a unified collection of terminology and concepts for the OHS profession.** This allows the Framework to provide descriptions of OHS job activities with a consistent and approachable vocabulary, making the Framework more accessible to OHS employers that may be overwhelmed by inconsistent labels and definitions used across the profession.
    - **Framework II exceeds the international standards set by INSHPO's Capability Framework.** This allows Framework II to fully represent the set of competencies that are contained within an internationally validated outline of the knowledge and skills relevant to the OHS profession, so that OHS educators can use the Framework to align themselves with international expectations.

The Alliance is Committed to Contributing to the Development of a Regulatory Body for the OHS Profession

While British Columbia has established legislation that protects workers at the worksite, there exists no such regulatory structure for members of the OHS profession. This presents a challenge for the profession in establishing its acceptable levels of competency and in setting professional standards. The absence of a regulatory framework poses risks of inconsistent practices, potentially compromising worker safety and well-being. Recognizing this, the Alliance aims to champion the professionalization of the OHS field by helping to establish a regulatory body and through continuing to work with educational

programs to align with industry expectations. This initiative is not only crucial for OHS professionals but also benefits employers by ensuring a standardized skill set, facilitating effective communication, and creating safer workplaces. Educational institutions, too, stand to gain from clearer program structures, attracting individuals aspiring to join a recognized and respected profession. Through establishing the OHS Framework as a key document in defining the scope and breadth of the OHS profession, the Alliance is uniquely positioned to contribute to future professionalization efforts.

This involves the following activities:

- **Explore the Feasibility of Designation under the Act.** The Alliance will seek to conduct a feasibility study into whether the OHS profession would benefit from designation under the Professional Governance Act. Through working with the Office of the Superintendent of Professional Governance, and through leveraging existing connections to OHS professional organizations, this study will set the groundwork for the subsequent steps in the designation process through answering the following questions:
    - Determine whether a new organization or an existing organization (e.g., BCRSP, CSSE) would best serve as a regulatory body for the OHS profession
    - Specify the ideal structure and membership of the regulatory body's governance board
    - Draft sustainable policies for the regulatory body's admission requirements, standards of professional practice, competency standards, and disciplinary
    - Demonstrate how the malpractice of the OHS profession is contrary to the public interest through conducting a risk
    - Determine how to ensure the financial stability of the regulating body, including whether to implement an annual fee structure for registrants
- **Champion Professionalization for OHS.** Through its communication and outreach programs for the Framework and the Web Tools, the Alliance will continue to promote the value of professionalization to the OHS profession. The Alliance will continue to network with its regional and national partners, like BCRSP and CSSE, to ensure that accreditation and certification functions for the OHS profession are performed by mature and separate organizations. Future conversations with post-secondary institutions will also continue to promote curriculum standardization across the province for OHS professionals, advocating for the value of establishing OHS curricula that is aligned educational programs with professional expectations. By maintaining the connections established during Phase IV-B, the Alliance intends to remain in a central position to administer support and leadership to professionalization efforts within British Columbia and nationally.

Conclusion

The collaborative efforts of the Manufacturing Safety Alliance of British Columbia (the Alliance) and its partners have led to the successful development and implementation of key initiatives. Through the development of the OHS Competency Framework and Profile: Second Edition, the Curriculum Alignment Framework, the Competency Assessment Tool, and the Needs Assessment Tool, the completion of the current project marks a significant milestone in the professionalization of the OHS profession within British Columbia's manufacturing sector.

These products lay the foundation for further efforts to improve standards of practice within the OHS profession, such as through the establishment of a new regulatory body or through continued partnerships with higher educational institutions. The engagement of industry stakeholders, subject matter experts, educators, trainers, and other key players reflects a broad consensus on the need for standardized practices and the enhancement of professional standards within the sector.

The Alliance is committed to the long-term success of these products. The establishment of a technical committee for product maintenance will ensure that the OHS Competency Framework and web tools will evolve in response to emerging industry trends and practices, and the continued communication and outreach will allow for the Alliance to carve a unique space for the Framework to exist within British Columbia’s OHS community. The integration of these tools into the Alliance's web infrastructure, coupled with a proactive maintenance strategy based on user feedback, reinforces the commitment to continuous improvement and adaptability.

Overall, this project exemplifies a concentrated effort to address the lack of standardization and consistency within the OHS profession in British Columbia's manufacturing sector. The Alliance’s commitment to ongoing engagement, collaboration, and continuous improvement will ensure that these positive impacts will endure. Through this, this project will continue to make a lasting contribution towards fostering a culture of safety, well-being, and professionalism within the OHS profession and the manufacturing sector.

Appendices

APPENDIX A: STEERING COMMITTEE MEMBERS

Organization Name	Represented By	Title	Representation Type	Region(s) Represented	Business Contact Information
Andrew Peller	Daneen Skilling (Chair)	National Environmental Health and Safety Manager	Employer	Okanagan	1125 Richter Street, Kelowna BC E: daneen.skilling@andrewpeller.com
BC Food & Beverage	James Donaldson	CEO	Association	BC-wide	9440 202 St #310, Langley City, BC E: james@bcfb.ca
BCIT	Jennifer Elliott	Associate Dean	Education	BC-wide	3700 Willingdon Ave, Burnaby, BC E: jelliott77@bcit.ca
BlueTriton Brands	Kevin Thorburn	Director, Engineering – I&R	Employer	Fraser Valley	66700 Othello Rd, Hope, BC E: Kevin.Thorburn@bluetriton.com
Canadian Manufacturers and Exporters	Andrew Wynn-Williams	Divisional Vice President – BC	Association	BC-wide	2163 – 13353 Commerce Pkwy, Richmond BC E: andrew.wynnwilliams@cme-mec.ca
Kwantlen Polytechnic University	Wayne Tebb	Special Advisor, Strategic Innovation	Education	BC-wide	20901 Langley Bypass, Langley City, BC E: wayne.tebb@kpu.ca
Manufacturing Safety Alliance of BC	Lisa McGuire	CEO	Association	BC-wide	101-44981 Commercial Crt, Chilliwack BC E: l.mcguire@safetyalliancebc.ca
Peak Renewables Ltd.	Scott Bax	CEO	Employer	BC-wide	#1400 – 1199 West Hastings St. Vancouver, BC E: scott.bax@peakrenewables.ca
Teamsters Union	Paul Barton	Secretary-Treasurer	Union	BC-wide	490 E Broadway, Vancouver, BC E: pcbarton@shaw.ca
WorkSafeBC	Megan Martin	Manager, OHS Consultation & Education Services	Regulator	BC-wide	6951 Westminster Hwy, Richmond, BC E: megan.martin@worksafebc.com
Ex-officio: Ministry of Post-Secondary Education and Skills Training	Matthew Boddy	Senior Program Manager	Government	BC-wide	2nd Floor, 800 Johnson Street Victoria, BC E: Matthew.Boddy@gov.bc.ca

APPENDIX B: ADVISORY COMMITTEE MEMBERS

Organization Name	Represented By	Title	Representation Type	Region(s) Represented	Business Contact Information
Manufacturing Safety Alliance of BC	Lisa McGuire	CEO	Association	BC	101-44981 Commercial Crt, Chilliwack BC E: l.mcguire@safetyalliancebc.ca
University of Waterloo	Phil Bigelow	Associate Professor	Academic	Canada	E: pbigelow@uwaterloo.ca
Advocate Workplace Safety Services	Bruce Jackson	Principal	Industry	BC	E: advocateohs@gmail.com>
Institute for Work and Health	Lynda Robson	Scientist	Academic	Canada	E: lrobson@iwh.on.ca
Manufacturing Safety Alliance of BC	Steve Conway	Mental Health and Wellness Director	Academic/Industry	BC	E: s.conway@safetyalliancebc.ca
Vancouver Psych Health and Safety	Merv Gilbert	Director	Academic/Industry	BC	E: merv@psychsafety.org
Public Service Alliance of Canada	Paul Carolan	Regional Representative	Industry	Canada	E: paul.carolan1@gmail.com
WorkSafe BC	Frank Hamade	Occupational Hygiene Officer	Industry	BC	E: Frank.Hamade@worksafebc.com
BC Ferries	David Fagen	Executive Director, Safety, Health, Environment & Security	Industry	BC	E: David.Fagen@bcferries.com
Institute for Work & Health	Emile Tompa	Senior Scientist	Academic	Canada	E: etompa@iwh.on.ca
President and CEO	Steve Horvath	Radiation Safety Institute of Canada	Industry	BC	E: steve_horvath@sympatico.ca
Unifor	Sari Sairanen	National Director of Health Safety and Environment	Industry	BC	E: Sari.Sairanen@unifor.org

APPENDIX C: HIGHER EDUCATION COMMITTEE MEMBERS

Organization Name	Represented By	Title	Representation Type	Region(s) Represented	Business Contact Information
Manufacturing Safety Alliance of BC	Lisa McGuire	CEO	Association	BC	l.mcguire@safetyalliancebc.ca
British Columbia Institute of Technology	Gurleen Bhatia	Faculty	Academia	BC	gbhatia1@bcit.ca
The University of British Columbia	Chris McLeod	Associate Professor and Head, Occupational and Environmental Health Division	Academia	BC	chris.mcleod@ubc.ca
Pacific Coast University	Wolfgang Zimmermann	President	Academia	BC	wolfgang@nidmar.ca
University of Victoria	Jaclyn Davidson	Associate Director OHSE	Academia	BC	jaclynd@uvic.ca
Simon Fraser University	Anne-Kristina Arnold	Sr. Lecturer, Epidemiology	Academia	BC	anne_kristina_arnold@sfu.ca
Institution of Occupational Safety and Health	Duncan Spencer	Head of Advice and Practice	Professional	International	duncan.spencer@iosh.com
Board of Canadian Registered Safety Professionals/INSHPO	Robin Angel	Chair, BCRSP; Secretary/Treasurer, INSHPO	Professional	National/ International	robin.t.angel@gmail.com
BC Tree Fruit	Craig Ogilvie	Vice President of Supply Chain	Industry	BC	cogilvie@bctree.com
Agropur	Mark Reilly	West Region Prevention Manager	Industry	BC	mark.reilly@agropur.com

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