



Professional Engineers
Ontario

Pre-Start Health and Safety Review Guideline

June 2022



CONTRIBUTORS
Nino Balbaa, P.Eng.
Grant Elligsen, P.Eng.
Renee Frigault, P.Eng.
James Lowe, P.Eng.
Raj Nellore, P.Eng.
Tom Norton, P.Eng.
José Vera, P.Eng.
Sherin Khalil, P.Eng.

REVIEWERS
Andrew Buczakowski, P.Eng.
Peter Rusch, P.Eng.
Neil Kennedy, P.Eng.
Roger Jeffreys, P.Eng. (MOL)
Al Lightstone, P.Eng.



Pre-Start Health and Safety Review Guideline

CONTENTS

1. PEO MANDATE AND CRITERIA FOR GUIDELINES	4
2. PREFACE	4
3. PURPOSE AND SCOPE OF GUIDELINE	5
4. INTRODUCTION	5
4.1 The PSR report	5
4.2 PSR applicability	5
5. ROLES AND RESPONSIBILITIES	5
5.1 Professional responsibility	5
5.1.1 Responsibilities of the practitioner	5
5.1.2 Responsibilities of the client	6
5.2 Scope of work	6
5.3 Liability	6
5.4 Competency and disclosure	7
5.5 Conflict of interest	7
5.6 Duty to report	7
6. PRE-START HEALTH AND SAFETY REVIEW PROGRAM	8
6.1 Data collection	8
6.2 Review of information	8
6.3 Evaluation	8
6.4 Report	8
6.5 Enhanced practice	8
7. RECOMMENDATION ON SAFETY CONTROL SYSTEMS	8
8. LOCKOUT/TAG-OUT PROCEDURE	9
9. HAZARDOUS AREA CLASSIFICATION	9
10. RISK ASSESSMENT	10
11. EQUIVALENCY	10

Notice: The Professional Standards Committee periodically reviews guidelines to determine if the guideline is still viable and adequate. However, practice bulletins may be issued from time to time to clarify statements made herein or to add information useful to those engineers engaged in this area of practice.

12. CAUTIONARY ADVICE	11
12.1 Evaluation as to whether a PSR is required.....	11
12.1.1 Exemptions.....	12
12.2 Other compliance issues.....	14
13. REFERENCES	14
14. DEFINITIONS AND ABBREVIATIONS	14

1.

PEO MANDATE AND CRITERIA FOR GUIDELINES

For more information on the purpose of practice guidelines, the guideline development and maintenance processes, including the Professional Engineers Ontario (PEO) standard form for proposing revisions to guidelines, please read our [document](#).

To view a list of the PEO guidelines, please visit the Knowledge Centre section of the PEO [website](#).

2.

PREFACE

In June 2019, the Professional Standards Committee (PSC) formed a subcommittee of engineers experienced with providing services in Pre-Start Health and Safety Review to revise the previous *Professional Engineers Providing Reports for Pre-Start Health and Safety Reviews* guideline, published in 2001.

They were tasked to investigate the current statutory, ethical and professional aspects of providing Pre-Start Health and Safety Review services. The subcommittee was instructed to revise best practices for practitioners undertaking this work and prepare a guideline describing these best practices.

The subcommittee met for the first time on June 16, 2020 and a completed draft of the revised guideline was reviewed and approved by the PSC on January 31, 2021.

At various stages of the development process, drafts of this guideline were distributed to a network of reviewers. These reviewers were a valuable source of additional comments and questions. Following consultations with practitioners, co-regulators and other stakeholders, the final draft was approved by Council at its meeting on April 8, 2022.

Notes:

1. References in this guideline to the word “practitioners” refer to engineers and firms holding a certificate of authorization (C of A) to offer and provide engineering services to the public as defined in the *Professional Engineers Act*, henceforth referred to as the PEA.
2. References in this guideline to the word “engineers” apply equally to professional engineer licence holders, temporary licence holders, provisional licence holders and limited licence holders issued under the PEA.

3. For the purposes of this guideline the term “public interest” refers to the safeguarding of life, health, property, economic interests, the public welfare and the environment for the benefit of the general public.

3.

PURPOSE AND SCOPE OF GUIDELINE

The purpose of this guideline is to provide practitioners undertaking a Pre-Start Health and Safety Review (PSR) with guidance on the level of diligence, methods and reporting acceptable to Professional Engineers Ontario.

For the purposes of this guideline, PSR means the review, assessment and production of a report as required by O. Reg. 528/00 amending Section 7 of the Regulations for Industrial Establishments of the *Ontario Occupational Health and Safety Act* (hereafter referred to as O. Reg. 851).

To determine when a PSR is required, refer to regulations and guidelines issued by the Ministry of Labour, Training and Skills Development (MLTSD).

Clients may request reviews by practitioners for purposes other than to fulfill the requirements for a PSR. It is prudent to ascertain the client’s needs. (Refer to Section 12 Cautionary Advice)

For the purposes of this guideline, the client is the person or entity who owns or controls the equipment or process to be reviewed and who is primarily responsible for its safe operation. The practitioner is the person who undertakes to do the review. The relationship between the client and the engineer can be one of a specific contract, e.g., the engineer is an outside consultant or one of employer and employee.

Throughout this guideline, the term “should” implies a “best practice” recommendation for practitioners. The term “shall” implies that the applicable action is mandatory because it is supported by regulations.

INTRODUCTION

Section 7 of O. Reg. 851 of the *Occupational Health and Safety Act* (OHSA) requires that in certain circumstances, an owner, lessee or employer obtain a written report signed and sealed by a practitioner containing:

- a) details of the measures to be taken for compliance with the relevant provisions listed in the Table of Section 7 of O. Reg. 851 (the Table);
- b) if testing is required before the apparatus or structure can be operated or used, or before the process can be used, details of measures to protect the health and safety of workers that are to be taken before the testing is carried out; and
- c) if item 3 or 7 of the Table applies, details of the structural adequacy of the apparatus or structure.

4.1 The PSR Report

This will be referred to herein as the Report.

The purpose of the Report is to ensure that a timely professional review identifies non-compliance, including non-compliance associated with exposure to mechanical/structural hazards, explosive environments, chemicals and other designated substances in those specific circumstances identified in the Table.

A PSR is required:

- a) because a new apparatus, structure or protective element is to be constructed, added or installed or a new process used, as identified in the Table; or
- b) because there is to be a modification to an existing apparatus, structure, protective element or process, as identified in the Table.

The Report shall identify the items of non-compliance and indicate what measures are necessary to bring the apparatus, structure, protective element or reviewed process into compliance with applicable sections referenced in Section 7 of O. Reg. 851. Where no items of non-compliance are identified in the course of the PSR, the report shall indicate that the apparatus, structure, protective element or process complies with the applicable sections referenced in Section 7 of O. Reg. 851.

4.2 PSR Applicability

PSRs are mandatory only in factories that are provincially regulated. A factory is broadly defined in the OHSA but does not include federally regulated workplaces or workplaces such as mines or mining plants, construction sites, logging operations, health care facilities or educational facilities. (See Section 12 Cautionary Advice)

To obtain more information on the OHSA and O. Reg. 851, contact the local district office of MLTSD.

ROLES AND RESPONSIBILITIES

5.1 Professional Responsibility

5.1.1 Responsibilities of the Practitioner

Practitioners shall be familiar with the OHSA and applicable regulations (O. Reg. 851) prior to providing PSRs. Refer also to PEO's *Guideline to Professional Engineering Practice (2020)* and the MLTSD's *Guidelines for Pre-Start Health and Safety Reviews: How to Apply Section 7 of the Industrial Establishments Regulation*.

PSRs are intended to identify potential hazards to workers in a factory and identify remedial measures to control or remove these potential hazards before a new apparatus, structure, protective element or process (or modification to an existing apparatus, structure, protective element or process) is operated or used in that factory.

“Control or removal” means that measures are identified to provide that the sections referenced in Section 7 (and, where applicable, the standards or codes approved by the MLTSD) are met. The practitioner should understand that the requirements for PSRs are limited to the circumstances defined in the Table.

Practitioners are reminded of their obligations under Section 31(2) of the OHSA, which specifies that a practitioner, as defined in the PEA, will have contravened the OHSA if a worker is endangered as a result of the professional engineer's negligent or incompetent advice or assessment.

Practitioners should educate their clients on the following requirements:

- A PSR is a legislative requirement of the OHSA, Section 7 of the O. Reg. 851 and is separate and distinct from other inspections that may be required. Other inspections could include but are not limited to those provided by CSA, ESA, TSSA, etc.
- A PSR is not an approval process. The practitioner is not approving or certifying the equipment, structure or process for safe use. The PSR is a report stating the condition of the equipment at the time of inspection, which would include a statement as to whether the equipment, structure or process is or is not compliant with the applicable standards and regulations. The PSR process should result in an objective report

based upon applicable standards and regulations. Practitioners are advised not to use the words “safe” or “unsafe” when writing reports but to use “compliant” or “non-compliant.”

- There is no requirement for the practitioner to return and verify that the non-compliances have been adequately mitigated (i.e. a sign-off letter). The OHSA is based on the internal responsibility system, whereby the client is responsible for the protection of their employees. To this end, it is required that the client implement appropriate measures to rectify the areas of non-compliance so that the equipment, structure or process meets the applicable standards and regulations. The client must document what they have done to achieve compliance.
- PSRs are limited to the circumstances and applicable provisions listed in the Table in Section 7 of O. Reg. 851. Although there are many machines and processes that do not require a PSR, the employer is still obligated to meet all other sections of O. Reg. 851.
- Practitioners conducting the PSR cannot be responsible for any administrative controls implemented by the client. Although it is outside the scope of the PSR, recommendations may be made with regard to these items, but responsibility for the implementation of these would rest with the client. Administrative controls and procedures could include (but are not limited to) emergency planning, training, preventative maintenance, teaching or set-up requirements, procedures for material feeding, safe operating procedures, safe loading and unloading procedures, risk assessment, safe work practices, lockout, permit-to-work systems, supervisory control, personal protective equipment (PPE), housekeeping, warning signs, awareness barriers, ergonomics assessments, etc.
- While practitioners who undertake PSRs are responsible for identifying and addressing issues of non-compliance with the applicable sections of O. Reg. 851, practitioners do not bear responsibility for implementing the report recommendations.

5.1.2 Responsibilities of the Client

The client remains responsible for ensuring that all requirements of the OHSA and regulations are complied with within the workplace. Even where a PSR is not required, or an exemption from the requirements of Section 7 applies, the client is responsible for ensuring that all persons are protected before operating any apparatus, structure, protective element or process in the workplace.

The client is required to:

- 1) Provide the practitioner with all applicable documentation and drawings such as electrical, mechanical, hydraulic and pneumatic;
- 2) Ensure the new or modified apparatus, structure, protective element or process is not operated or used until a review has been conducted;

- 3) (a) Ensure all measures identified in the PSR required for compliance have been implemented; or
(b) if some or all of the measures specified in clause (a) are not taken, the client shall provide a written notice to the JHSC or the HSR, if any, of what measures have been taken to comply with the relevant provisions of O. Reg. 851 that are listed in the Table.
- 4) Keep all PSR reports and exemption documentation in a readily accessible location in the workplace; and
- 5) Ensure that all documentation is provided to the JHSC or the HSR for review before the apparatus, structure, protective element or process is operated or used.

5.2 Scope of Work

Practitioners under O. Reg. 851 should:

- Submit in writing to the client their proposed PSR and hazard analysis programs for the work, as outlined in Appendix 1; and
- Confirm in writing that the PSR has been carried out in accordance with the requirements of this guideline and Section 7 of O. Reg. 851 on completion of a PSR.

Practitioners performing a PSR where the client is their employer may find other formats varying from Appendix 1 more appropriate.

Items beyond the scope of the PSR include:

- The ongoing maintenance of an apparatus, structure, protective element or process; and
- A follow-up visit to confirm correction of deficiencies or operating compliance with the applicable section(s) of O. Reg. 851 (it may be arranged as an additional assignment, refer to Section 6.5 – Enhanced Practice).

5.3 Liability

A practitioner providing services to the public, such as a PSR, shall be a holder of a C of A and shall either carry professional liability insurance as stipulated in O. Reg. 941, Section 74 or disclose in writing to the client that the holder is not insured.

An employee doing work within the employer’s facilities does not need a C of A but may require professional liability insurance coverage to cover his or her personal liabilities for the work.

Section 53 of O. Reg. 941 exempts engineering documents solely used for internal purposes from being sealed. All PSR reports are required to be available for review by MLTSD inspectors. Therefore, because these documents are not solely for internal purposes, all PSR reports except Circumstance 8 PSR reports are required to be sealed in compliance with the Use of Seal requirements in Section 53.

A practitioner, as an employee undertaking a PSR, shall be aware that Section 31(2) of the OHSA sets out the personal liability incurred by an engineer who gives advice and provides reports

required under the PEA. These liabilities include personal responsibilities that apply to the engineer whose seal and signature are found on the report or drawings and not to the company that employs that engineer.

5.4 Competency and Disclosure

The PSR shall include:

- a) details of the measures to be taken for compliance with applicable provisions of the OHSA;
- b) details of measures necessary to protect the health and safety of workers before any testing can be conducted;
- c) details of the structural adequacy of the structure if Item 3 (Racking) or 7 (Lifting devices) of Table 1 applies; and
- d) the seal and signature of the practitioner conducting the PSR (only Circumstance 8 allows for PSR to be provided by non-practitioners).

Significantly more could be included in a report, and examples of content are outlined in Sections 6.4 and 6.5 in this guideline. For further guidance, refer to MLTSD's *Guidelines for Pre-Start Health and Safety Reviews*.

Practitioners are also reminded of their obligations under the professional engineer's Code of Ethics; specifically, that the practitioner shall always act with,

- knowledge of developments in the area of professional engineering relevant to any services that are undertaken; and
- competence in the performance of any professional engineering services that are undertaken.

The practitioner may consider providing the client with a CV or examples of recent projects (respecting confidentiality issues) which they have worked on to demonstrate their knowledge and competence with regards to the work to be undertaken.

5.5 Conflict of Interest

O. Reg. 941/90 made under the PEA describes the circumstances that create a conflict of interest. Specifically, one aspect of professional misconduct is Conflict of Interest.

Section 72(2)(i) states, "professional misconduct" means, failure to make prompt, voluntary and complete disclosure of an interest, direct or indirect, that might in any way be, or be construed as, prejudicial to the professional judgment of the practitioner in rendering service to the public, to an employer or to a client, and in particular, without limiting the generality of the foregoing, carrying out any of the following acts without making such a prior disclosure:

1. Accepting compensation in any form for a particular service from more than one party.
2. Submitting a tender or acting as a contractor in respect of work upon which the practitioner may be performing as a professional engineer.
3. Participating in the supply of material or equipment to be used by the employer or client of the practitioner.

4. Contracting in the practitioner's own right to perform professional engineering services for other than the practitioner's employer; or
5. Expressing opinions or making statements concerning matters within the practice of professional engineering of public interest where the opinions or statements are inspired or paid for by other interests."

To know when disclosure is appropriate, a clear understanding of what causes a conflict of interest is needed. One example of a conflict of interest may be when a practitioner is involved with the selection of equipment but also completes the PSR review.

Conflicts of interest may not be obvious to the practitioner, so before engaging in the work, it is important to complete a conflict check. The conflict check should include other stakeholders in the practitioner's firm to ensure it is thorough and complete.

The simplest and most effective way to deal with potential conflicts of interest is to be forthright and communicate with the appropriate parties about any circumstances that could reasonably lead those parties to question the practitioner's judgment.

For more information on "Conflict of Interest," refer to the *Professional Engineering Practice* guideline.

5.6 Duty to report

The duty to report is an essential component of the professional engineer's Code of Ethics and commitment to professionalism. Section 77(2)(i) of Regulation 941 under the PEA states, "A practitioner shall regard the practitioner's duty to public welfare as paramount."

Practitioners may feel pressure to quickly identify issues of non-compliance and unsafe situations in light of their duty to report and protect the public. However, they should remember that the PSR process already obligates the client not to operate or use the new or modified apparatus, structure, protective element or process until a review has been conducted and until all measures required for compliance have been taken or the Joint Health and Safety Committee notified.

Section 72(2)(c) states that professional misconduct means a "failure to act to correct or report a situation that the practitioner believes may endanger the safety or the welfare of the public."

Similarly, Section 72(2)(f) states that professional misconduct means a "failure of a practitioner to present clearly to the practitioner's employer the consequences to be expected from a deviation proposed in work if the professional engineering judgment of the practitioner is overruled by non-technical authority in cases where the practitioner is responsible for the technical adequacy of professional engineering work."

For more information on the "Engineer's Duty to Report," please refer to the *Professional Engineering Practice* guideline.

PRE-START HEALTH AND SAFETY REVIEW PROGRAM

A PSR involves four steps:

1. data collection;
2. review of information;
3. evaluation; and
4. reporting.

6.1 Data Collection

Practitioners should obtain sufficient information to permit an evaluation of compliance with the applicable sections of O. Reg. 851 referenced in the Table in Section 7 for the apparatus, structure, protective element or process to be reviewed. The client typically supplies the documentation. If sufficient documentation cannot be supplied, the practitioner should visit the site to obtain the necessary information to determine if there are items of non-compliance. A site visit is strongly recommended. However, if a site visit is not done, the report should include the reasons why a site visit was not needed to properly complete the PSR.

6.2 Review of Information

The review is typically based on final/as-built and design documentation supplied by the client, such as building plans, equipment specifications and operating process manuals, which are in sufficient detail to permit the practitioner to identify compliance with the sections of O. Reg. 851 identified in the applicable provisions of the Table in Section 7. Where they exist, the PSR may also be comprised of a review of design drawings, layout and specifications of an apparatus, structure, protective element or process.

6.3 Evaluation

Practitioners shall evaluate the information reviewed in the context of the applicable sections of O. Reg. 851 identified in the Table in Section 7. If applicable, the professional engineer may also refer to codes and standards of practice referred to in Appendix I of the MLTSD guidelines. The practitioner may be assisted in conducting the evaluation by other professionals, such as engineers in other disciplines or other specialized experts, such as industrial hygienists.

6.4 Report

The PSR shall be in writing and should identify the design drawings, layout, specifications and procedures reviewed and the applicable codes and standards used in evaluating the apparatus, structure, protective element or process.

The Report shall indicate items or areas of non-compliance identified during the PSR and recommend measures to make the apparatus, structure, protective element or process compliant with

the applicable sections of O. Reg. 851 referenced in Section 7. Note that recommended measures are not required to include detailed design.

The report shall be signed and sealed by the practitioner(s) taking responsibility for the review. Where the undertaking has involved a multidisciplinary team, it is recommended that the report indicate the identities of the team members, their professional designations, the nature of their expertise and the role played by each team member. It is also recommended that the report be signed (and sealed, where applicable) by all team members.

The Report should be a separate document from other work that may be required by the client. Refer to Appendix 2 for more content details.

6.5 Enhanced Practice

There is no requirement for the practitioner to return and verify that the non-compliances have been adequately mitigated.

Although practitioners completing the PSR are not required to examine the as-installed equipment, practitioners are strongly encouraged to do so if adequate design drawings do not exist or if practitioners wish to ensure the installation is done according to the design. If during the PSR, some additional safety items beyond the scope of work are identified and recommended to be implemented, then it is suggested the same can be verified after implementation.

It is suggested that the client demonstrate that all awareness devices are functioning as planned and that any programmable safeguards have been validated.

It is recommended that the PSR report include evidence of the tests and confirmations with photos and videos as appropriate. If testing is not possible, the practitioner may suggest proof of validation as a compliance requirement.

RECOMMENDATION ON SAFETY CONTROL SYSTEM

Where applicable, safety control system recommendations should be provided to the client unless expressly excluded from the scope of work.

Safety control systems refer to electrical, mechanical, pneumatic and hydraulic control circuits on machines that have protective devices, of which a failure could present a danger to personnel. A practitioner should understand common and uncommon failure modes for these circuits.

At the minimum, practitioners engaging in reviewing the safety control system should have a thorough understanding of how risk analysis is used (in the CSA Z432 Standard, for example) to determine the minimum safety control circuit requirements.

Note that various terms such as Performance Level (PL), Safety Integrity Level (SIL) and Category are used, but the popular reference is to PL as given by the ISO 13849-1 Standard. If a practitioner is asked to review safety circuit diagrams, safety component selection and/or safety software programs, they should do so with an understanding of the requirements for Safety-Related Parts of Control Systems (SRP/CS).

Safety circuit design techniques may include redundancy, component diversification, positive guided contacts, mechanically linked auxiliary contacts for feedback, switches mounted in the positive mode, safe torque off, Output Signal Switching Device (OSSD) outputs, rising/falling edge signals, fault exclusion, anti-tiedown, fail-safe, prevention of fault-masking, emergency dump valves, pilot-operated check valves, etc.

For more information, refer to Standards CSA Z432 and ISO 13849-1&2.

Subject to the applicable provisions and circumstances found in the Table, the practitioner should consider all potential energy sources when reviewing the safety control system. These energy sources may include but are not limited to gravity, mechanical motion and momentum, potential energy, electrical, pneumatic and hydraulic pressure, temperature and radiation.

8.

LOCKOUT/TAG-OUT PROCEDURE

Compliance with lockout/tag-out related requirements of O. Reg 851 S.42, 74, 75, 76 are referred to in applicable standards but relate to clauses of the Industrial Establishments Regulation that are not prescribed for review under the “safeguarding device that signals a stop” or any other PSR conditions identified in the Table and are therefore outside the prescribed scope of the PSR.

The reviewer may choose to broaden the scope of work to include the evaluation of lockout points and/or procedures. Reviewers may also consider clarifying that the presence of safeguarding devices does not remove the need to follow safe operating procedures and to lockout equipment or block it from moving, in compliance with O. Reg 851 Sections 42, 74, 75, and 76, where required for performing maintenance or other activities outside of a system’s normal operating state.

9.

HAZARDOUS AREA CLASSIFICATION

Often practitioners are asked to identify hazardous locations where concentrations of flammable gas/vapour or combustible dust/fibres/flyings are present. This is referred to as hazardous location area classification.

Practitioners performing a PSR involving these circumstances in the Table in S.7 of O. Reg. 851: 1 (‘flammable liquids’), 4 (‘process that involves risk of ignition or explosion’) and 5 (‘dust collectors’) often find themselves invited to include area classification in their scope of work.

Formal training and experience are necessary for engineers performing area classifications. CSA C22.1 Appendix L contains helpful recommendations on what level of training and experience those engineers should have. Practitioners are well-positioned to provide area classification services because of their education, willingness to research applicable standards, Code of Ethics and professionalism. No particular engineering field is a prerequisite for this service, as noted in CSA C22.1 Appendix L(5), though an understanding of basic chemistry and thermodynamics is essential.

When performing area classification, either separately or together with a PSR involving one of the three circumstances noted earlier, a background in Ontario Fire Code reviews is essential because issues related to storage, dispensing, ventilation, bonding and grounding, explosion protection and other control measures are almost always encountered by the practitioner performing the area classification. Indeed, the practitioner must be diligent in informing the client whether or not their scope of work (under area classification) will include a broader review against the Ontario Fire Code and fire/explosion prevention standards.

The practitioner performing the area classification should have a thorough understanding of the relevant standards, such as but not limited to:

- CSA C22.1 (Canadian Electrical Code) sections 18, 20 and appendices F, H and J;
- IEC 60079-10-1&-2;
- NFPA 497;
- NFPA 499;
- API RP505;
- FM Global Data Sheet 5-1;
- Ontario Fire Code; and
- National Fire Code of Canada.

Practitioners should be cautious to ensure that the client understands that the practitioner is not authorized to approve an electrical installation in accordance with the Ontario Electrical Safety Code. A relationship has developed over time and will

likely remain in effect, where electrical inspection agencies call on a company to provide their own hazardous location area classification drawings by commissioning a professional engineer. The practitioner, in turn, advises the company to seek an electrical inspection based on those drawings.

It is often necessary to clarify one or more of the following points with the client:

1. While Canada and the United States still recognize the Division system for hazardous area classification on existing installations (i.e., Class I, II, III / 'Division 1 or 2'), this has largely been replaced by the Zone system (i.e., Class I / 'Zone 0, 1 or 2' and Class II or III / 'Zone 20, 21 and 22'). This was done to harmonize CSA Standards with the IECEx system. The gas and dust groups have also been changed. Refer to CSA C22.1 sections 18 and 20 for more information.
2. A field inspection by an electrical inspector in accordance with CSA SPE1000 and the Ontario Electrical Safety Code, in general, is not intended to be an inspection of electrical installations in hazardous locations. CSA SPE-1000 excludes several items including hazardous area inspections, from its scope. Clause 1.7(c) states that the Model Code does not apply to the field evaluation of equipment for use in hazardous locations. Therefore, companies should be advised that electrical equipment in hazardous locations requires certification by a certification body that has been accredited by the Standards Council of Canada for this type of work. In fact, the review is referred to as "product certification," which is an evaluation and approval process that is conducted to determine compliance with a specific CSA Standard for products in hazardous locations. Part 2 of the Canadian Electrical Code (CSA C22.2) contains a number of those unique product standards.
3. A field inspection label on a panel or a CSA label on an enclosure or piece of equipment, has often been the source of confusion as it relates to overall machine safety. Companies often mistake that type of label as a mark that "the machine is safe" from a machine guarding perspective when they should recognize that only the risks of electrocution and fire are considered, and only under normal/expected environments (not necessarily hazardous locations).
4. The term "electrical" area classification can be misleading. Flammable liquids and dust can ignite upon contact with any hot surface (in excess of the auto-ignition temperature) and not from electrical energy alone. As such, steam lines, gas-fired equipment and hot materials, in general, should be scrutinized in a hazardous location.

10.

RISK ASSESSMENT

While risk assessments are not specifically legislated as part of a PSR, a risk assessment may be needed to properly complete a PSR especially in relation to functional safety for Circumstance 2 PSRs. Risk assessment methods may vary depending on the nature of the work and the types of hazards under consideration. At the minimum, practitioners participating in risk assessment should understand how the assessment is performed according to relevant standards including CSA Z432 and such standards referenced within that standard.

A practitioner may recommend that the client completes a risk assessment and/or may facilitate the process. A comprehensive risk assessment will normally be done by a multi-disciplinary team with all the requisite expertise (e.g., mechanical, electrical, chemical, ergonomic, etc.) to address all possible workplace hazards and include representation from various stakeholders, including operators, maintenance, engineering, health and safety and management.

11.

EQUIVALENCY

The OHSA and O. Reg. 851 permit meeting the safety performance objectives by alternative or equivalent means. The equivalency section in O. Reg 851 (Section 2) allows for workplaces to change how a standard is met, as long as the proposed alternative provides a level of safety that is equal to, or greater than, that required by the relevant section of the regulation.

See also subsections 32.1 to 32.4 of the (1990) OHSA, as amended, which permit the approval of all or part of a code or standard of practice by the MLTSD. These subsections may provide a defense to someone accused under the regulation by proving that what was done afforded protection for the health and safety of workers at least equal to the protection they would have been afforded had the approved code or standard of practice been applied.

If equivalency is used in the design being reviewed, an analysis should be made to ensure that the alternative provides a level of safety that is equal to, or greater than, that required by the regulation or the approved code or standard of practice.

The results of such an analysis should be provided in the report. The analysis and rationale on which the equivalency was determined

should be clearly documented and retained on file by the client. It should be noted that the MLTSD guideline qualifies equivalency.

12.

CAUTIONARY ADVICE

A client may ask for a review of an apparatus, structure, protective element or process to ensure compliance with the OHSA or regulations for a variety of reasons, such as, but not limited to:

- a) a PSR as required by Section 7 of O. Reg. 851 as set out herein;
- b) a request or order by MLTSD for the client to have a safety review performed by a practitioner;
- c) a requirement for a practitioner's report following an accident; or
- d) an order by an MLTSD inspector with respect to the load units of a floor, roof or temporary work or part of a building.

This guideline deals only with the reason in point a). The client's needs and expectations may differ from what is required herein if the review is the result of the reasons in points b), c) and/or d). Therefore, before proceeding with a review, it is prudent to ascertain the client's motives for requesting such services.

Review of an apparatus, structure, protective element or process for PSR may, in some circumstances, require review of the environment in which the equipment or device will operate.

Clients, however, may simply ask for a review of documentary details on the apparatus, structure, protective element or process.

Practitioners involved in such situations should:

- a) determine if the environment or installation should be reviewed as part of the PSR; or
- b) state that a PSR cannot be completed without this determination and arrange with the client to expand the work to include whatever other aspects of the client's situation may need to be reviewed as the work progresses, outside the scope of a PSR; or
- c) advise the client that if the equipment environment cannot be determined, it will be noted in the report.

In situations where the client expects more than a PSR, the practitioner should attempt to provide for the client's actual needs and the safety of the public while at the same time accepting liability for only the work that has been provided.

Careful drafting of contractual arrangements between the client and practitioner is paramount in clarifying the client's expectations, and the practitioner's deliverables.

As in other aspects of engineering, clearly describing the scope of work before entering into an agreement will help to eliminate confusion in this area.

PSRs are intended to identify areas of non-compliance that the client must address. This may require redesign or a new design. The client's desired end result is a system that complies with the regulatory requirements.

This may involve much more than a PSR. Clarifying in contractual arrangements, prior to conducting the PSR, how non-compliance will be dealt with can help to prevent problems and misunderstandings. In all cases, the report shall accurately reflect the results of the PSR.

In situations involving safety, clients, especially small organizations, may place reliance on practitioners beyond what is normally considered the responsibility of the engineering profession.

Practitioners and their clients are advised to consult with appropriate MLTSD personnel, or appropriate professionals, in situations where compliance requirements are unclear.

12.1 Evaluation as to Whether a PSR Is Required

A client may ask a practitioner for advice as to whether a PSR is needed in a particular situation. In this case, the practitioner should refer to the latest version of the MLTSD's *Guidelines for Pre-Start Health and Safety Reviews*. An evaluation may require an assessment of some or all the information necessary to perform a full PSR. Practitioners should consider liability issues prior to undertaking this activity and doing so under contractual arrangements.

12.1.1 Exemptions

A PSR may not be required if certain exemption criteria are met.

The MLTSD guidelines provide details of what documents are considered acceptable to establish an exemption for each Table circumstance. Note that current MLTSD guidelines include requirements that certain exemption documents be issued by an accredited organization and/or bear the seal and signature of a professional engineer.

The table below summarizes the opportunities for exemptions and associated applicable Circumstances of the Table in S. 7 of O. Reg. 851 under OHSA.

ITEM	CIRCUMSTANCES	APPLICABLE PROVISIONS OF THIS REGULATION	EXEMPTIONS
1.	<p>Either of the following applies with respect to flammable liquids:</p> <ol style="list-style-type: none"> 1. More than 235 litres of flammable liquids are located in a building or room. 2. Flammable liquids are dispensed in a building, room or area. 	Subsections 22 (1), (2) and (4)	<p>All of the following requirements are met:</p> <ol style="list-style-type: none"> 1. No more than 235 litres of flammable liquids are stored per adequate cabinet. 2. No more than three cabinets containing flammable liquids are in a group of cabinets. 3. There is a minimum distance of 30 metres between groups of cabinets containing flammable liquids.
2.	<p>Any of the following are used as protective elements in connection with an apparatus:</p> <ol style="list-style-type: none"> 1. Safeguarding devices that signal the apparatus to stop, including but not limited to safety light curtains and screens, area scanning safeguarding systems, radio frequency systems and capacitance safeguarding systems, safety mat systems, two-hand control systems, two-hand tripping systems and single or multiple beam systems. 2. Barrier guards that use interlocking mechanical or electrical safeguarding devices. 	Sections 24, 25, 26, 28, 31 and 32	<ol style="list-style-type: none"> 1. The protective element was installed at the time the apparatus was manufactured; and, <ol style="list-style-type: none"> i. the apparatus and the protective element were manufactured in accordance with or have been modified to meet, current applicable standards; and ii. the apparatus has been installed in accordance with current applicable standards, if any, and the manufacturer's instructions. 2. The protective element was not installed at the time the apparatus was manufactured; and, <ol style="list-style-type: none"> i. the apparatus and the protective element were manufactured in accordance with, or have been modified to meet, current applicable standards; and ii. the apparatus and the protective element have been installed in accordance with current applicable standards, if any, and the manufacturer's instructions.

ITEM	CIRCUMSTANCES	APPLICABLE PROVISIONS OF THIS REGULATION	EXEMPTIONS
3.	Material, articles or things are placed or stored on a structure that is a rack or stacking structure.	Clause 45 (b)	The rack or stacking structure is designed and tested for use in accordance with current applicable standards.
4.	A process involves a risk of ignition or explosion that creates a condition of imminent hazard to a person's health or safety.	Section 63	The process is conducted inside a spray booth that has been manufactured and installed in accordance with current applicable standards.
5.	The use of a dust collector involves a risk of ignition or explosion that creates a condition of imminent hazard to a person's health or safety.	Section 65	None
6.	A factory produces aluminum or steel or is a foundry that melts material or handles molten material.	Sections 87.3, 87.4, 87.5 and 88, subsections 90 (1), (2) and (3), and sections 91, 92, 94, 95, 96, 99, 101 and 102	None
7.	Any of the following are used: 1. A travelling crane, overhead crane, monorail crane, gantry crane, jib crane or other lifting device suspended from or supported by a structure. 2. A vehicle lift or hoist.	Sections 51 and 53	1. The supporting structure was originally designed for the travelling crane, overhead crane, monorail crane, gantry crane, jib crane or other lifting device that is being installed or used. 2. The vehicle lift or hoist has been certified as meeting current applicable standards.
8.	A process uses or produces a hazardous biological or chemical agent and uses a ventilation system to limit the exposure of a worker in accordance with any exposure limit set out in Regulation 833 of the Revised Regulations of Ontario, 1990 (Control of Exposure to Biological or Chemical Agents) made under the act.	Sections 127 and 128	A portable device that extracts smoke, fumes or other substances and that does not exhaust to the outdoors is used.

12.2 Other Compliance Issues

A PSR in a particular situation may require compliance with more than a single provision of the Table in Section 7. A practitioner should ensure the client is aware of all the provisions that may apply.

Further, the practitioner should be aware that there may be other associated regulations, standards or requirements that may apply in conducting the review of compliance with the regulatory sections referred to in the Table. Refer to the MLTSD guideline for guidance in this regard.

When doing work such as a PSR, practitioners may become aware of other compliance issues. The practitioners should consider broadening their scope of work to include other areas of non-compliance. For more information, refer to the MLTSD guideline.

13.

REFERENCES

- *Occupational Health and Safety Act and Regulations for Industrial Establishments*, R.R.O. 1990, Reg. 851 as amended by O. Reg. 528/00, Toronto: Queen's Printer.
- PEO *Professional Engineering Practice*, 2020.
- *Guidelines for Pre-Start Health and Safety Reviews: How to Apply Section 7 of the Regulation for Industrial Establishments*, Toronto: Ministry of Labour
- Electrical Safety Authority: Bulletin 18-1-18 / "Classification of hazardous locations" / May 2016
- CSA C22.1-2015: Appendix L / "Engineering guidelines for determining hazardous area classifications"
- A listing of local district offices is maintained on the [MLTSD website](#)
- Ontario Fire Code
- National Fire Code

14.

DEFINITIONS AND ABBREVIATIONS

Where such definitions conflict or differ from what is in applicable legislation, the regulatory definition replaces the one used in this guide. For the purposes of this guideline:

Apparatus—equipment or machine or device or structure.

Client—person or entity who owns or controls the apparatus to be reviewed and who is primarily responsible for the safe operation of the apparatus and the safety of operators (a.k.a. property owner, asset owner, lessee, employer, OEM manufacturer, etc.).

Compliance—in accordance with and minimizing safety hazards—this is the term practitioners should use rather than describing an apparatus, process or element as "safe" or "safety" when writing reports.

Consultant—a person who provides expert advice professionally.

CSA—the Canadian Standards Association, is accredited by the Standards Council of Canada (SCC) as a standards development organization.

Employee—a person employed for wages or salary, especially at a non-executive level.

Employer—a person or organization that employs people.

Equivalency—coequality, parity or sameness of quality, content or performance

ESA—Electrical Safety Authority

HSR—Health and Safety Representative

IEC—International Electrotechnical Commission

IECEx—International Electrotechnical Commission System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres (IECEx System)

IRS—Internal Responsibility System

ISO—International Organization for Standardization

JHSC—Joint Health and Safety Committee

MLTSD—Ministry of Labour, Training and Skills Development (a.k.a. former MOL)

Modifications—activities or work on an apparatus, protective element or process that changes any original design, operation or installation parameters used in the PSR.

OHSA—Ontario *Occupational Health and Safety Act*

O. Reg.—Ontario Regulation that states what each employer is obligated to provide in the workplace. Regulations are made by the Ontario government ministry that is responsible for administering a statute.

PLC—programmable logic controller

PPE—personal protective equipment

Process—for purposes of this guideline are those processes listed and identified in the table found in Section 7 of the Industrial Establishments Regulation

Protective Element—shield, guard, control element, locking device or other device preventing access and/or operation of an apparatus

PSC—Professional Standards Committee within PEO

PSR—Pre-Start Health and Safety Review, which includes a written report that outlines areas of non-compliance and the measures necessary to achieve compliance with the Industrial Establishments Regulation and the OHSA.

Risk assessment—a scientific process used to evaluate the potential for adverse impact on human health or on property.

TSSA—Technical Standards and Safety Authority.

APPENDIX 1.

SCOPE OF WORK FOR PRE-START HEALTH AND SAFETY REVIEWS

A practitioner offering to provide a PSR report should provide the client with a scope of work for a pre-start health and safety review that includes, as applicable:

- an opening sentence indicating the work is related to a pre-start health and safety review;
- a reference to the client and what they do or make;
- the location of the client's facility that will be involved;
- a description of the apparatus, structure(s), protective element(s) or process(es) being reviewed;
- a notation as to whether the apparatus, structure(s), protective element(s) or process(es) are new or modified;
- the item or items in the Section 7 Table that may apply to each item of apparatus, structure, protective element or process;
- a list of other professionals who may be involved, with their scope of responsibility;
- a list of the materials, manuals, design documents and other reference materials that it may be necessary for the client to provide;
- a list of reference materials that may be needed that the practitioner or others will provide;
- the timeframe in which the review and report will be developed, together with a schedule that outlines dates by which the client or others will provide review materials, documents and design drawings;
- a two-phase approach is highly recommended consisting of a document review followed by a site visit inspection with testing of the energized equipment before issuing formal PSR report;
- a list of activities to be carried out by the practitioner or others working on the project;
- a list of items that may require review but are not included in the scope of work for a PSR, and for which separate report(s) may be issued;
- a clear/explicit statement indicating that the design of remedial measures is outside the scope of a PSR;
- where remedial design is carried out by others, an indication as to whether a further review is included or excluded from the scope;
- the standards or specifications, if any, that the client may specify to be used;
- a notation as to whether a site visit (or visits) is to be part of the scope;
- where appropriate, a notation as to whether the client wishes to correct non-compliant items before a PSR report is issued;
- the level of detail that can be expected in the report recommendations;
- the format of the report and associated documents that are to be provided to the client;
- the terms and conditions for the contract of professional services being provided.

APPENDIX 2.

PRE-START HEALTH AND SAFETY REVIEW REPORT

- A pre-start health and safety review report should include, where appropriate, an opening statement indicating:
 - what in general terms was carried out,
 - the client and the basic client activities involved,
 - the apparatus, structure(s), protective element(s) or process(es) involved and their general relationship to the operations,
 - the location of the client's facility;
- A statement of the review of documents containing:
 - the list of documents reviewed (including drawings, specifications, manuals and manufacturers' instructions), referenced to the individual items in the scope of work,
 - standards to which the designs, procedures, measures, apparatus, structure, protective element or process were evaluated, referenced to the individual items in the scope of work,
 - the sections in O. Reg. 851 that were applied or used in the review by items in accordance with the Table in Section 7 and applicable associated sections,
 - documentation of site visits if part of the scope,
 - why a site visit was not done, if that was the case;
- a statement containing:
 - details of the measures to be taken to achieve compliance with relevant provisions of O. Reg. 851 by item of review and by item in the Table of Section 7, if any,
 - where testing is to be carried out, details of measures to protect the health and safety of workers that are to be taken before testing is carried out, by items reviewed and by item in the Table in Section 7, if any,
 - where items 3 or 7 of the Table in Section 7 applies, details of the structural adequacy of the apparatus or structure, if any,
 - an indication, where more than one person is involved, of who has reported on the individual items,
 - items, if any, that were in the original scope but could not be adequately reviewed because the client provided insufficient documentation within the timeframe for the work to be completed,
 - where no additional measures are identified as necessary to achieve compliance with O. Reg. 851, the report should indicate that the apparatus, structure, protective element or process complies with the applicable sections of the Regulation for Industrial Establishments referenced in Section 7; and
- a concluding statement indicating that the scope of work has been completely carried out per the original agreement.



Professional Engineers
Ontario

40 Sheppard Avenue West, Suite 101
Toronto, ON M2N 6K9

Tel: 416-224-1100 or 800-339-3716

Enforcement Hotline: 416-224-1100 Ext. 1444
or 800-339-3716 Ext. 1444

www.peo.on.ca