

Pre-Start Health and Safety Review: Regulation and Practice in Ontario

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Abstract:

The Ontario government introduced, effective October 7, 2000, a regulation requiring employers, owners and lessees to have a knowledgeable person undertake a Pre-Start Review (PSR) to ensure there is compliance with applicable safety legislation. Equipment, processes and structures which are subject to a Pre-Start Review cannot be used until that review has been conducted and measures necessary to protect worker safety have been implemented. This paper will review the conditions that trigger a PSR, the due diligence aspects for the engineer who conducts the PSR, and the linkages to proactive approaches to safety management.

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The following presentation is intended to be used as general information only. The information is not represented or delivered as legal or engineering advice. It is the responsibility of the user to ensure that any information used is accurate and current at all times. Irrespective of any other requirements, Section 7 of the *Regulations for Industrial Establishments* prevails.

1 BACKGROUND:

Prior to 1997, factory owners (not employers) were required to submit plans regarding changes to and within the premises to the Ministry of Labour for approval. This resulted in long delays. In December 1997, the process was 'privatized' and owners or lessees of certain hazardous processes had to obtain a report called a Pre-Development Review (PDR) from a Professional Engineer before any equipment, machine or device was constructed, developed altered, reconstructed or installed in a factory.

The requirements for the PDR were overly broad and ambiguous. It required professional engineers to review drawings of the proposed Work (i.e, construction, alteration,

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reconstruction or installation of any equipment, machine or device in a factory) to the equipment (including guarding), or processes involving “a substance that is hazardous”, and then, stamp those drawings to certify that if the equipment or process was altered as proposed by the drawings, then that equipment or process would comply with the *entire* Occupational Health and Safety Act and regulations. In summary the PDR regulation was vague. Also, it was not clear under what circumstances exemptions were possible. As a result of its many deficiencies, the initial PDR regulation proved too difficult to enforce. The Ministry of Labour withdrew the PDR requirement and went back to the drawing board.

2 THE PRE-START HEALTH AND SAFETY REVIEW IN ONTARIO

After consultation with stakeholders, the Occupational Health and Safety Act (OHSA) was revised to include Section 7 on Pre-Start Health and Safety Review (PSR), and the new PSR legislation came into force in October 2000. In May 2001, the Ministry of Labour published a detailed, comprehensive guideline outlining how Section 7 of the Industrial Regulation is to be implemented. In November 2001, the Association of Professional Engineers of Ontario (PEO) finalized its *PSR Guideline* that adopts and supplements the Ministry of Labour Guideline. These guideline documents are meant to be used together and provide clear guidance on what must be reviewed and on what constitutes an exemption. However, they do not provide clear guidance on the extent to which the engineer providing the PSR should prescribe the measures to be taken to address any identified deficiencies. For this reason, there is a good deal of variability in the cost and quality of the PSR reports, depending on the reviewer.

OUTLINE PEO guideline requirements

The PSR includes a written report on the construction, addition or installation of a new apparatus, structure, protective element or process, or modifications to an existing apparatus, structure, protective element or process. The PSR report details the measures (steps, actions or engineering controls) necessary to bring the construction, addition, installation or modifications into compliance with the applicable provisions of the Regulation for Industrial Establishments as listed in the section 7 Table (Table 1 below). Section 3 below describes the conditions that trigger a PSR. Section 4 details what a PSR report must include.

The PSR represents a distinct shift towards a more proactive approach to safety in the Province of Ontario. Because the PSR is proactive, it provides owners an opportunity to identify, remove or mitigate hazards up front, rather than merely hoping that an incident doesn't occur and risking the consequences that could arise from an incident, including losses to people, the environment, assets, and production. In addition, the Ministry of Labour guidelines correctly state that by "integrating health and safety at the design stage and before operations begin is a cost-effective and proactive way to prevent workplace illness or injury. The benefits are numerous. They include direct savings from minimizing retrofitting; claims due to fewer illnesses and injuries; and, most important, maintaining productivity, health and safety in the workplace."

3 CONDITIONS THAT TRIGGER A PSR

3.1 The Table

The main improvement in this regulation over its predecessor is its clarity. Now the government has included a table in the regulation which lists the exact sections of the existing Industrial Regulations and the circumstances under which a PSR is required. If the new or modified Apparatus, Structure or Protective Element is subject to the sections of the Industrial Regulation listed in that Table and the circumstances described in the table will exist, then a PSR is required. Table 1 below contains the Table found in Section 7 of the regulation along with some supplementary information from the Ministry of Labour *Guidelines for Pre-Start Health and Safety Reviews* and identifying the designated substances for Item 8 of the Table.

Table 1: Section 7 Table

Item	Applicable Provisions of this Regulation	Circumstances
1 [†]	Subsections 22 (1), (2) and (4)	Flammable liquids are located or dispensed in a building, room or area.
2	Sections 24, 25, 26, 28, 31 and 32	Any of the following are used as protective elements in connection with an apparatus: <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

3	Clause 45 (b)	Materials, articles or things are placed or stored on a structure that is a rack or stacking structure
4	Section 63	A process* involves a risk of ignition or explosion that creates a condition of imminent hazard to a person's health or safety.
5 [†]	Section 65	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
6 [†]	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	A factory produces aluminum or steel or is a foundry that melts material or handles molten material
7	Sections 51 and 53	The construction, addition, installation or modification relates to a lifting device, travelling crane or automobile hoist
8 [†]	Sections 127 and 128	A process* uses or produces a substance that may result in the exposure of a worker in excess of any occupational exposure limit set out in Regulation 833 [Control of Exposure to Biological and Chemical Agents], 835 [Acrylonitrile], 836 [Arsenic], 837 [Asbestos], 838 [Asbestos on Construction Sites and in Buildings and Repair Operations], 839 [Benzene], 840 [Coke Oven Emissions], 841 [Ethylene Oxide], 842 [Isocyanates], 843 [Lead], 844 [Mercury], 845 [Silica] or 846 [Vinyl Chloride] of the Revised Regulations of Ontario, 1990

* For the purpose of this section, the term "process" refers only to those processes listed and identified in Table 1 under items 4 and 8.

† No exemptions allowed.

3.2 To Whom Does the Regulation Apply?

It applies to every Ontario employer who operates a factory (as defined in the OHS Act). It does not apply to construction sites, mines, mining plants, or logging operations.

3.3 To What does the Regulation Apply?

The PSR will be applicable if the Table applies and work is to be performed to (i) equipment, machines or devices ("Apparatus"); (ii) a shield, guard, an operating control acting as a guard, a locking device or any other device which prevents access ("Protective Element"); and (iii) structures (i.e. buildings) ("Structures"). Processes are also subject to a Pre-Start Review, although the term is not defined in the regulation nor in the supporting guidelines.

3.4 When Is a Pre-Start Review required?

A review may be required if there will be a **new** apparatus, structure or protective element constructed, added or installed or a new process to be used.

A review may also be required if an **existing** apparatus, structure, protective element or process is to be modified and one of the following steps must be taken to obtain compliance with the Table:

1. new or modified engineering controls are used;
2. other new or modified measures are used;
3. a combination of new, existing or modified engineering controls and other new or modified measures is used.

But, a Pre-Start Review is not required where a machine (after maintenance has been performed) is “reconstructed”.

3.5 Who undertakes a Pre-Start Review?

For items 1 through 7 of the Section 7 Table, the PSR must be undertaken by a Professional Engineer.

For item 8 of the Section 7 Table, the PSR shall be conducted by a Professional Engineer or by a person, who, in the opinion of the owner, lessee or employer, possesses special expert or professional knowledge appropriate to assess any potential or actual hazards. In the Ministry of Labour’s *PSR Guidelines* the following example of a knowledgeable person is given for this instance, “a person with professional credentials such as a Certified Industrial Hygienist (CIH) or Registered Occupational Hygienist (ROH)”.

3.6 What must the PSR Report Include?

According the Ministry of Labour *PSR Guidelines*, a PSR report must contain:

1. Details of measures that must be taken to bring the apparatus, structure, protective element or process into compliance with the specified provisions of the *Regulation for Industrial Establishments* listed in Table 1. Note: If the reviewer has used standards, specifications, calculations, risk analyses or other parameters other than the requirements of the *Regulation for Industrial Establishments*, he or she must list the details of all those references or parameters, upon which the Pre-Start Health and Safety Review is based.
2. 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 testing is carried out. Note: For the purposes of this section, "testing" includes debugging, commissioning and similar operations prior to production.
3. Details of the structural adequacy of the apparatus or structure if item 3 or 7 of Table 1 applies.

4. The date and signature of the person performing the Pre-Start Health and Safety Review (see subsection 7(13)).

list the PEO guideline highlights

3.7 When is the Pre-Start Review Complete?

The PSR Regulation specifies that all measures identified in the PSR as being required for compliance with the relevant sections of the Section 7 Table must be taken **before** the apparatus, structure or protective element or process is operated or used. Thus, the PSR ends when all the measures identified in the PSR have been taken and the apparatus, structure or protective element is put into production.

If the owner, lessee or employer does not take some or all of the measures specified in the PSR, they must notify the JHSC of what alternate measures have been taken to comply with the relevant provision of the regulation that are listed in the Section 7 Table. The Ministry of Labour *PSR Guidelines* stipulate that “this means that the alternate measures are to be the same type, since the objective is the same: to comply with the applicable provisions of the regulations.” The *PSR Guidelines* also refer to Section 2 of the *Regulation for Industrial Establishments*, which defines Equivalency. Two issues are important here. First, a physical device can only be substituted with another physical device, NOT with a procedure or any other type of administrative control. Secondly, the alternate measure taken must provide **equal or greater protection** than the measure prescribed by the engineer in the PSR.

3.8 Who gets a Copy of the Pre-Start Review?

A copy goes to the employer, owner or lessee whose responsibility it is to obtain the report. A copy must also go the Joint Health and Safety Committee (JHSC) but the obligation to supply the report to the JHSC is not the responsibility of the Professional Engineer. It is the responsibility of the recipient of the report. The report must be delivered to the JHSC **before** the equipment or process can be used or operated following the installation, modification or construction.

A copy must be maintained on the premises, along with any supporting documentation. They must be available for review by the JHSC and a Ministry inspector.

3.9 Are Exemptions Possible?

There are exemptions in certain cases if documentation is available establishing that the Apparatus or Protective Element was manufactured and installed **in accordance with current applicable standards**. The Ministry of Labour *PSR Guidelines* refers to

numerous codes and standards, including not only those legislated in Ontario but also Canadian, North American, European and World standards. If an exemption is possible, then it is necessary to retain the documents that support the exemption for as long as the equipment or process is used in the workplace.

For table items 1, 5, 6, and 8, exemptions are **not** possible.

4 DUE DILIGENCE CONSIDERATIONS FOR ENGINEERS WHO CONDUCT THE PSR

4.1 Who Is Responsible for Completing the PSR?

Ontario employers, owners and lessees need to understand and comply with the PSR requirements.

Engineers must be aware of the requirements of performing a PSR, and the standards available for review and consultation in identifying potential hazards and solutions. If the PSR requirements are ignored, there will be no possibility of a due diligence defence in the event of a prosecution following an accident involving a machine or process which required a review where none was undertaken.

4.2 What are the Due Diligence Considerations for Engineers

4.2.1 The Professional Engineers Act

Under the Professional Engineers Act, an engineer could be disciplined for Professional Misconduct under the following conditions:

- negligence
- failure to make reasonable provision for safeguarding of life/health
- failure to make responsible provision for complying with applicable statutes
- undertaking work that the engineer is not competent to perform, based on training/experience

In the opinion of the author, the last point is particularly significant for the PSR. If the PSR requires evaluation of a complex device/system encompassing more than one branch of engineering or area of expertise, it is imperative that the engineer not be tempted to work outside of his/her area of expertise. In such a case, it is advisable to take a multidisciplinary team approach with each engineer signing off on his/her section of the review.

4.2.2 *The Occupational Health and Safety Act*

In addition, under Section 31(2) of the Occupational Health and Safety Act (OHSA) states that "...a professional engineer as defined in the *Professional Engineers Act* contravenes this Act if, as a result of his or her advice that is given or his or her certification required under this Act that is made negligently or incompetently, a worker is endangered". According to OHSA Section 66. (1), "Every person who contravenes or fails to comply with,

- (a) a provision of this Act or the regulations;
- (b) an order or requirement of an inspector or a Director; or
- (c) an order of the Minister, is guilty of an offence and on conviction is liable to a fine of not more than \$25,000 or to imprisonment for a term of not more than twelve months, or to both" .

It is important to note that OHSA penalties refer to the *person*, (i.e. engineer) and not to the employer of the engineer. The engineer is *personally liable* under the requirements of the OHSA. The engineer may also be subject to civil litigation.

The good news is that under OHSA there is a due diligence defense. That is, it shall be a defense for the accused to prove that all reasonable precautions were taken.

4.3 **How Can I Demonstrate Due Diligence in Completing the PSR?**

There are 4 elements to be duly diligent in conducting PSRs:

- Follow the *PEO Guideline* issued in November 2001
- Do not work outside of your area of expertise
- Clearly define the scope of work
- Document everything, including:
 - Scope of work
 - Assumptions
 - Restrictions
 - Analyses
 - Understanding and agreements
 - References

According to the PEO Guideline the PSR process entails

- **Data collection** – obtain sufficient information
- **Review of information** – where they exist PSR also comprises review of design drawings, layout and specs of an apparatus, structure, protective element or process. If deemed necessary PSR may include on-site visit.
- **Evaluation** – evaluate in a professional manner in accordance with standards and other professionals. If equivalency being used in design being reviewed, analysis should be documented and results reported to client to ensure safety level is maintained.
- **Reporting** – The PSR is a written report in which the engineer:
 - Identifies documents reviewed, including references to applicable codes and standards.
 - Indicates the non-compliance issue(s).

- Specifies the measure(s) recommended.
- Indicates details of the structural adequacy if item 3 or 7 of the Table apply.
- If testing is to be done, outlines requirements to protect workers during testing.
- Must be signed and sealed

Providing engineering services to public requires Certificate of Authorization (C of A) ??? and must carry insurance. If the engineer does not carry insurance, he/she must notify the client that he/she is not insured. The Employee engineer does not need a C of A but may require insurance. Remember, liabilities of S31(2) of OHSA are personal liabilities not the company that employs the engineer.

Engineers performing a PSR must have thorough understanding of performance-based Regulations, i.e., what must be achieved under the Industrial Regulations. In addition, engineers performing PSRs must also have a thorough understanding of current applicable codes (e.g., building code) and standards (e.g., CSA/ANSI/ISO/EN/NFPA), appropriate to the situation under review.

5 THE PSR AS PART OF THE PROACTIVE APPROACH TO SAFETY MANAGEMENT

A functional and documented process safety management system demonstrates due diligence. The following is a list of typical elements of a safety management system. Typically a company will start with a few key elements and then expand as the program matures. The PSR process fits in under Item 2 *Know Your Operation*, Item 5 *Take Charge of Change* and Item 6 *Protect Yourself*.

- 1. THE RIGHT ATTITUDE:** Commitment from every single member of the company is essential to making process safety management (PSM) work.
- 2. KNOW YOUR OPERATION:** Know the hazards of materials you work with and of your equipment. Identify safety requirements and existing capabilities and weaknesses. Correct the problems and implement appropriate procedures and practices.
- 3. REDUCE YOUR HAZARDS:** Find ways to make your operation safer, e.g. reduce your inventory of hazardous substances, find less hazardous substitutes, or change your processes & practices.
- 4. KNOWLEDGE AND SKILL ARE KEY:** Train your work force in proper procedures and practices, develop task requirements for employees and contractors, and update training to keep up with changes.
- 5. TAKE CHARGE OF CHANGE:** Any change can negate the previous understanding of risk. A change in one part of your operation may affect other parts. Understand the scope, boundaries, and implications of a change and design a plan to manage the associated risk.
- 6. PROTECT YOURSELF:** Keep equipment in top shape, inspect and maintain it faithfully, conduct regular safety reviews to reduce the likelihood of a process-related incident. Be prepared if an incident does occur to minimize the

consequence by having a working emergency response plan and appropriate emergency equipment available.

7. **LEARN FROM MISTAKES:** Investigate accidents and near-accidents, determine the underlying cause, and make whatever system changes are necessary to prevent them from happening again.
8. **BE A GOOD CITIZEN:** Work with the community and with local emergency planning officials to minimize the potential impacts on the community of process risks.
9. **ONCE IS NOT ENOUGH:** Managing process safety is a continuous improvement process – the Plan-Do-Check-Act cycle. It should not be a document on a shelf but an everyday part of running your business successfully. In order to keep the PSM system effective and efficient over the long term, it is imperative to monitor the system (including regular audits and reviews by senior management) and to use the results of the monitoring process to enhance the PSM system.

6 OBSERVATIONS ABOUT THE PRACTICE OF PRE-START HEALTH AND SAFETY REVIEWS IN ONTARIO

Since 2001, the author has been involved in the training of approximately 200 individuals, primarily engineers, on PSR regulation and practice. Part of this training includes discussions about current practices in PSRs in Ontario. Based on this experience, the following are some observations on the state of PSRs in Ontario are:

- a) There is a wide range of scope/quality in the PSR reports being provided to industrial establishments both by external consultant engineers and by internal employee engineers. Complaints should be addressed to Professional Engineers Ontario (PEO). PEO works on the assumption that if there are no complaints, there are no problems with the way Pre-Start Health and Safety Reviews are being conducted. To the author's knowledge, neither PEO, nor the Ministry of Labour are auditing the level of practice for PSRs.
- b) Many practicing engineers who are being asked to conduct PSRs are not familiar with the OHSA and regulations for Industrial Establishments, hazard analysis methods, or relevant codes and standards
- c) Many engineers are concerned about due diligence, particularly if their employer is asking them to sign and seal PSRs that involve issues outside of their area of training and experience. For complex systems, it is advisable to take a team approach. In addition, many engineers have concerns around ensuring they have adequate insurance coverage to provide the PSR service.

- d) The PSR legislation is proactive. This is a major cultural change from looking upon safety as a regulated obligation to realizing the opportunity the PSR provides for business benefits. Some companies are recognizing this benefit. However, many are still acquiring new equipment or making changes to their facilities and then afterwards calling in an engineer to do a PSR. By delaying the PSR, they often miss out on the opportunity to make changes in design rather than adding-on costly engineering controls to bring the equipment into compliance with the relevant sections of Occupational Health and Safety regulations.