TECHNICAL SAFETY BC

Manual for General Supervision and Risk Assessed Status Plants

Boiler and Refrigeration Plants

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Technical Safety BC is an independent, self-funded organization mandated to oversee the safe installation and operation of technical systems and equipment.

In addition to issuing permits, licences, and certificates, we work with industry to reduce safety risks through assessment, education and outreach, enforcement, and research.

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Disclaimer:

Please note that references to the legislation, codes, directives, safety orders, and web pages throughout this document may not reflect the most recent versions available.

Therefore, the user should make sure that references are current and relevant to any situation that they are dealing with.

The latest version of this document is available in PDF format on the Technical Safety BC website: https://www.technicalsafetybc.ca/ , Toll free: 1.866.566.7233

Contents

Introduction

Boiler and refrigeration plants (plants) that are not exempt under section 6 of the Power Engineers, Boiler, Pressure Vessel, and Refrigeration Safety Regulation (the regulation) are required to be supervised by a certified individual while in operation. Plants can be operated as a continuous supervision status plant under section 45 of the regulation or a special plant under section 54 of the regulation.

There are two categories of special plants established under the regulation:

- general supervision status plant (section 55);
- risk assessed status plant (section 56).

Plants registered as general supervision or risk assessed status are authorized to operate with a reduced level of on-site supervision using control technology, effective management, and additional training of plant personnel.

Scope

This document, in conjunction with Directive: D-BP 2024-01 General Supervision and Risk Assessed Plant Registration Requirements, establishes the minimum technical and administrative requirements for special plant registration and operation.

Before registering a general supervision status plant, a provincial safety manager may direct additional administrative and technical specifications to be met beyond those included in this manual.

This manual has been developed to assist plant owners in preparing for, applying for, and maintaining special plant registration.

Special Plant Categories

General Supervision Status Plant

A plant may be registered as general supervision status if it is not located in an institution or public assembly occupancy premises (as defined within section 2 of the regulation) and does not exceed the maximum allowable size for the plant type:

- a power plant that does not exceed 30 m^2 of boiler capacity;
- a steam heating plant that does not exceed 200 m^2 of boiler capacity;
- a fluid heating or low pressure thermal fluid plant that does not exceed 500 m^2 of boiler capacity;
- a low temperature low pressure fluid plant that does not exceed 2000 m^2 of boiler capacity;
- an unfired plant that does not exceed 1000 m^2 of boiler capacity; or
- a refrigeration plant that does not exceed a total capacity of 1000 kW prime mover nameplate rating.

A plant operating as general supervision status must, as a minimum, have an individual holding the appropriate class of certificate of qualification. This individual must:

- be present on plant premises for the duration of time determined by a plant safety audit inspection and, as required by a provincial safety manager; and
- inspect the plant in accordance with conditions established by a provincial safety manager.

Before registering a general supervision status plant, a provincial safety manager may direct additional administrative and technical specifications to be met beyond those included in this manual.

Risk Assessed Status Plant

A plant may be registered as a risk assessed status if the plant is located in an institution or public assembly occupancy premises and does not exceed the maximum allowable size for the plant type:

- a fluid heating or low pressure thermal fluid plant that does not exceed 500 m^2 of boiler capacity;
- a low temperature low pressure fluid plant that does not exceed 2000 m^2 of boiler capacity;
- an unfired plant that does not exceed 1000 m^2 of boiler capacity; and/or
- a refrigeration plant not exceeding a total plant capacity of 1000 kW prime mover nameplate rating.

A plant operating as a risk assessed status must, as a minimum, have an individual holding the appropriate class of certificate of qualification. This individual must

- be on the plant premises no less than seven hours per day (or such greater time as may be required by a provincial safety manager); and
- inspect the plant in accordance with conditions established by a provincial safety manager.

Before registering a risk assessed status plant, a provincial safety manager may direct additional administrative and technical specifications to be met beyond those included in this manual.

Technical and administrative Requirements

Appendix A & B detail the minimum technical and administrative requirements that must be met for plants seeking general supervision or risk assessed status registration.

- Appendix A establishes the minimum criteria for plant control systems.
- Appendix B establishes the minimum criteria that must be addressed through a plant safety and management program.

In addition, appendix C & D provide supporting information for the development, evaluation, and maintenance of special plant programs:

- Appendix C provides an audit checklist addressing the minimum criteria established in appendices A & B, and
- Appendix D provides a list of commonly used terms and their associated definitions.

Registration Process

Application

Plant owners may apply for special plant registration through submission of an application form (FRM-1017) and payment of the applicable fee(s). More information on the application process can be found on Technical Safety BC's website: Special Plant: General Supervision and Risk Assessed Status.

Registration Assessment

An assessment will be carried out by Technical Safety BC to verify that all applicable requirements of s. 55 or 56 of the regulation, and the technical and administrative requirements set by the provincial safety manager have been met. The technical review may include, but is not limited to, an inspection of plant equipment and systems, a review of the plant safety and management program, including interviews with individuals responsible for the management of the plant, and witnessing of safety control testing to verify satisfactory operation.

Prior to scheduling an assessment, owners must ensure that their plant meets all the requirements outlined in the Safety Standards Act, Safety Standards General Regulation, and Power Engineers,

Boiler, Pressure Vessel and Refrigeration Safety Regulation (collectively, the Act and regulations), all applicable adopted codes, directives, safety orders, and the technical and administrative requirements detailed in Appendix A and B of this manual. Failure to meet all applicable requirements will result in a failed assessment. Upon correction of any identified non-compliances, a follow-up assessment will be performed to verify that all requirements have been met.

Certificate Issuance

Upon successful completion of the registration assessment, a General Supervision or Risk Assessed status plant registration certificate will be issued authorizing the plant to operate as a General Supervision or Risk Assessed plant.

Maintaining General Supervision and Risk Assessed Status

Plant owners are responsible for maintaining compliance with the Act and regulations, adopted codes and terms and conditions established by the provincial safety manager. Any changes to the accepted plant configuration, capacity and/or plant safety and management program, must be reported to Technical Safety BC.

Failure to maintain compliance with all applicable requirements may result in the suspension or cancelation of registration.

Cancellation

Plant owner may withdraw or cancel their registration at any time and return to continuous supervision status under section 45 of the regulation.

Oversight of General Supervision and Risk Assessed Status Plants

General supervision and risk assessed plants may be subject to assessment, including investigation, monitoring, or audit, by Technical Safety BC at any time. Technical Safety BC inspects plants periodically to confirm that compliance is being maintained with the Act and regulations, adopted codes and terms and conditions established by the provincial safety manager.

Appendix A. Technical Specifications

1. Minimum Safety Devices

As plants vary to a great extent in design and operational features, it is not possible to provide a complete list of automatic controls, safety devices and other electronic monitoring devices needed to ensure the safe operation of a plant. It is the responsibility of the owner to perform a documented risk assessment for their facility to determine the minimum safety devices required to assure the safe operation of the plant when the power engineer or refrigeration operator is not in attendance. This risk assessment shall consider the need for redundancy in critical safety devices.

At a minimum, boiler and refrigeration plants must comply with the following:

Boiler Plants

All boilers must meet the requirements of ASME CSD-1 (controls and safety devices for automatically fired boilers) or NPFA 85 (Boiler and Combustion Systems Hazard Code), current editions and must be equipped with the following additional control devices:

Low Water Cut-Off Control

A minimum of two low water cut-off devices, (or flow sensing devices for automatically fired hot water boilers complying with CSA B51 6.3.2.3) must be provided for the boiler(s), each of which shall be independent of the other or others and shall be capable of safely shutting down the boiler(s) in the case of a low water or flow condition. A minimum of one on the devices must be of the manual reset type.

In addition to their normal function of safe boiler(s) shutdown, the devices must initiate an audio-visual alarm. The alarm from the devices must also be remotely monitored.

Refrigeration Plants

All refrigeration plants must meet the requirements of CSA B52 for control and safety devices and must be equipped with the following additional safety devices. Activation of any of the following safety devices must initiate an audio-visual alarm. In addition, the following safety devices must be monitored remotely.

Critical Safety Devices

At a minimum, the following safety devices must be hard-wired to stop the compressors from operating when activated. When the protection is provided through a computer control system or a programmable logic control system, a redundant safety device must be installed to directly interrupt operation of compressors when activated.

- High Side High Pressure limiting device (CSA B52, Clause 7.2.2.1)
- High Liquid Level switch (CSA B52, Clause 5.6.3.1)

Refrigerant Level Monitoring

There must be continuous monitoring of refrigerant levels within the machinery room and if the refrigerant is used outside the machinery room, additional refrigerant detectors will be required where refrigerant from a leak may be concentrated.

Ammonia Ventilation Monitoring for Safety

The ventilation system must be equipped with an air proving device used to verify the operation of the ventilation system.

2. Remote Monitoring

Plants must be equipped with a method of remotely monitoring critical operational parameters and safety devices when the plant is not under continuous supervision by a qualified individual. Remote monitoring systems must provide notification to the qualified individuals on call who can respond in a timely manner. When an alarm notification is generated, the system/procedure must include a process to confirm positive acceptance verifying response.

It is the responsibility of the owner to determine which operational and safety devices require remote monitoring to support safe operation of the plant. At a minimum the following items must be remotely monitored:

- Operational parameters key to the safe operation of the plant (ie, temperature, pressure, flow, etc.)
- Safety devices critical for safe operation of the plant, including but not limited to any condition/alarm which results in the shut-down of the plant.

Appendix B. Plant Safety and Management Program Guideline

The purpose of this guideline is to provide minimum elements that must be established within a plant safety and management program (the program) for general supervision and risk assessed plants. The program may be a single document, or a collection of multiple documents provided all of the applicable items within this appendix are addressed.

Depending on the complexity, location, age, classification, etc. of the plant, additional requirements beyond the contents of this appendix may be required. During the registration assessment the safety officer may direct that additional elements be included to assure the safe operation of the plant

1. Cover Page

Cover or introductory pages should be included and address the following:

- organization's name, logo (if applicable), and physical address;
- issue date;
- edition; and
- revision level.

2. Table of Contents, Revision History, and Defined Terms

Program documentation must address the following:

- table of contents listing the documents sections;
- table that tracks the revision history; and
- table of definitions (glossary) for all abbreviated titles and/or terms used frequently within the program documentation.

3. Document Control

Indicate how the program documentation will be revised, distributed, and implemented. It should indicate the persons responsible for document control, including submittal of revisions to Technical Safety BC for review and acceptance when required.

Note: Changes to program documentation are only required to be submitted to Technical Safety BC for acceptance when they have a material impact on program.

4. Statement of Authority and Responsibility

A written description of the authority and responsibilities of the person(s) in charge of the plant must be provided. In addition, provide wording that those in charge have the freedom to identify non-compliances and to take corrective actions, including shutting down the plant if needed, with the full support of management. The highest authority noted on the organizational chart must sign the Statement of Authority and Responsibility.

5. Organization Chart and Job Descriptions

An organizational chart showing the reporting relationships and lines of communication between management, chief engineer/person in-charge, plant operating personnel and Technical Safety BC must be provided. Additionally, job descriptions (duties and responsibilities) of key personnel whose performance affects the operation and management of the plant must be included.

6. Chief Engineer / Primary Person in Charge

The plant owner must designate a chief engineer/primary person in charge in writing who will be responsible for the operation and maintenance of a plant and for ensuring that all regulated work in

the plant is performed by appropriately qualified persons. This individual must possess the appropriate class of certificate of qualification for the type and size of the plant.

If the chief engineer/person in charge leaves the position or is unable to perform their duties for an extended period of time, the plant owner must inform Technical Safety BC of their replacement.

7. Plant Operating Personnel and Shift Schedules

A list of all plant operating personnel (power engineers, operators and safety awareness certificate holders) must be maintained including:

- each individual's certification number, class, and expiry date; and
- a description of their tasks and where and when they perform those tasks.

In addition, a plant supervision shift schedule should be maintained to ensure adequate coverage can be provided.

8. Standard Operating Procedures

All operating activities must have documented safe operating procedures including but not limited to:

- start-up and shut down;
- routine plant assessment and safety device testing;
- remote monitoring change-over;
- remote monitoring notification / call-out procedure; and
- Emergency shut down procedure.

The plant management in consultation with the person in charge should develop these procedures. These procedures must be document controlled and made available to all plant operating personnel.

9. Maintenance, Testing, and Inspection Procedures

Maintenance, testing and inspection procedures must be developed to establish an effective preventative oversight program for the plant. Maintenance, testing and inspection activities must be developed in compliance with adopted codes and standards, manufacturers recommendations and industry best practices (ie, ASME CSD-1, NBIC, ASME Section VI/VII, and CSA B51/B52). The exact structure of the procedure(s) will vary based on the type and complexity of the plant equipment and operations. Below are some key items that must be included/considered in the development of maintenance, testing, and inspection procedures. Procedures must:

- be clearly identified in writing;
  list all required maintenance, inspection, and testing activities including their frequency (daily, weekly, monthly, etc.);
- include provisions for promptly initiating corrective action in the event of non-conformance or malfunction of any equipment;
- include traceable identification for all units, safety devices, valves, and piping systems; and
- define those responsible for the performance of the maintenance, inspection, and testing activities (ie, in house for routine maintenance and minor repairs or by licensed contractor as service provider). Note: activities must only be performed by individuals who are trained, qualified, licensed (when applicable) and competent to complete the activity.

10. Annual Service Report

For plants employing boiler or refrigeration safety awareness certificate of qualification holders, the owner is responsible for obtaining, and keeping at the premises, an annual service report from a licensed boiler contractor in accordance with section 80 and 81 of the regulation. This annual service report must confirm that any work that has been carried out within the plant has been done in accordance with the manufacturer's specifications and the requirements of the regulation.

The program must include provisions for ensuring the required annual service reports are obtained and maintained on site in accordance with document and records retention requirements.

11. Training Program

It is the responsibility of the owner to ensure all individuals who perform regulated work maintain current knowledge and are appropriately trained, qualified and competent for the activities they are assigned to perform. A detailed written training program must be developed that at a minimum addresses the following requirements:

- Provides detailed training in all required areas to assure the safe operation of the plant and execution of the individuals specific role within the plant. This may include, but is not limited to:
    - Plant roles and responsibilities
    - Role specific expectations
    - Standard operating procedures
    - Maintenance, testing, and inspection procedures
    - Emergency response plans
    - Incident reporting
    - Exposure control plans
    - Available safety and awareness programs (ie, ammonia safety awareness)
- Provisions for the frequency at which the training will be provided to staff, including:
    - all new hires prior to being assigned responsibilities within the plant, and
    - all existing staff on a periodic basis.
- Provisions for record keeping of all staff training including training material, trainee, trainer and date training was provided.
- Provisions for training on new technical and regulatory requirements when changes are made to the plant, plant safety and management program, codes, and/or regulations.
- Provisions for review of training program for continual improvement.

12. Emergency preparedness

A written description of the plant's emergency preparedness plans and activities must be included. These may include but are not limited to:

- Emergency rescue plan
- Emergency evacuation procedures
- Periodic review and drill program
- Emergency shut down procedure
- Emergency contacts and response time
- Notification and evacuation plans if surrounding areas/properties have the potential of being affected

13. Documentation and Records

The owner must develop processes to maintain plant related records and documentation for a period as required by the regulation. Specific records to be maintained within the plant and referenced in the program include but are not limited to:

- A record of plant operations and maintenance must be maintained to document all regulated work performed within the plant. These records may be maintained through a hardbound logbook or, in lieu of a hardbound book, an electronic log may be used if it can be shown to provide a permanent and accurate record. At a minimum the log must:
    - Document all operational activities including but not limited to, start and end times of shift, shift activities, confirmation of completion of rounds, etc.
    - Document all maintenance activities including but not limited to, name and license number of contractor, summary of activities performed, etc.
    - Be available at the plant premises, preferably in the equipment room.
    - Be protected against damage or alteration.
    - Include the names and sample signature of all employees who are authorized to make entries into the log.
    - have provisions to capture the start and end of each shift that is signed by the shift engineer. The daily activities must be countersigned by the chief engineer of the plant.
    - Entries must be made in a legible manner and must include the individual's name and /or initials.
    - White out liquids or tapes should not be used to correct a note, instead, cross out the incorrect note, initial beside it, and supply replacement note.
    - Only certificate holders such as power engineers, licensed boiler contractors, and / or plant management can make entries into the logbook.
- Plant diagram/drawing should be available showing equipment and valve tags. The physical piping should show flow directions and indication of fluids contained within.

14. Incident Management and Reporting

The program must provide information on the organization’s procedures for the management and reporting of any incidents to Technical Safety BC including:

- responding to and managing incidents; and
- documenting and reporting incidents to Technical Safety BC.

All plant personnel must be made aware of reporting methods to Technical Safety BC.

15. Continual Improvement

A description of the processes and/or procedures that will be used to ensure the program remains current and up to date must be included. This may include but is not limited to:

- periodic review/audit of the program to ensure changes in operational procedures, personnel, roles and responsibilities, etc. are captured; and
- periodic review/audit of regulatory documentation to ensure the latest updates in codes, regulations, information bulletins, directives, and safety orders are captured and communication to plant personnel.

Appendix C. Special Plant Audit Checklist

Company name:			**Date:**
Plant Address:			
Auditor / Reviewer:			**Plant Number:**

Appendix A – Technical Specifications

	Minimum Safety Devices	Incl.	Auditor Notes
1.	**General – All Plants** • Has the owner performed a documented risk assessment (considering the need for redundancy in critical safety devices) for their facility to determine the minimum safety devices required to assure the safe operation of the plant? • Do all boilers meet the requirements of ASME CSD-1 (controls and safety devices for automatically fired boilers) or NPFA 85 (Boiler and Combustion Systems Hazard Code? **Note:** Activation of any of the safety devices must initiate an audio-visual alarm.	☐ **Yes** ☐ **No** ☐ **N/A**	
	Boiler Plants – Low Water Cut Off / Flow Switch • Has a minimum of two low water cut-off devices (or flow sensing devices for automatically fired hot water boilers complying with CSA B51 6.3.2.3), been provided for the boiler(s)? **Note:** each of the device(s) shall be independent of the other and shall be capable of safely shutting down the boiler(s) in the case of a low water or flow condition.	☐ **Yes** ☐ **No** ☐ **N/A**	

	Refrigeration Plants – Critical Safety Devices
	• Are the following safety devices (at a minimum) hard-wired to stop the compressors from operating when activated?
	  ○ High Side High Pressure limiting device (CSA B52, Cl. 7.2.2.1)
	  ○ High Liquid Level switch (CSA B52, Cl. 5.6.3.1)
	Note: when the protection is provided through a computer control system or a programmable logic control system, a redundant safety device must be installed to directly interrupt operation of compressors when activated.
		☐ **Yes**
		☐ **No**
		☐ **N/A**	

	Refrigerant Plants-Refrigerant Level Monitoring • Are the refrigerant levels continuous monitored within the machinery room? • If the refrigerant is used outside the machinery room, are there additional refrigerant detectors installed at locations where refrigerant from a leak may be concentrated?	☐ **Yes** ☐ **No** ☐ **N/A**	
	Refrigeration Plants - Ammonia Ventilation Monitoring • Has the ventilation system been equipped with an air proving device to verify the operation of the ventilation system?	☐ **Yes** ☐ **No** ☐ **N/A**	
Remote Monitoring		**Incl.**	**Auditor Notes**
2.	• Has the plant been equipped with a method of remotely monitoring critical operational parameters and safety devices when the plant is not under continuous supervision by a qualified individual?	☐ **Yes** ☐ **No** ☐ **N/A**	
	• Does the remote monitoring systems provide notification to the qualified individuals on call who can respond in a timely manner? • In case of a contract with a third party, is there a call out procedure developed?	☐ **Yes** ☐ **No** ☐ **N/A**	
	• Does the system/procedure include a process to confirm positive acceptance verifying response, when an alarm notification is generated?	☐ **Yes** ☐ **No**	

		☐ N/A	

	• Has the owner to determined which operational and safety devices require remote monitoring?
	• Do those monitoring devices include the following at a minimum:
	  ○ Operational parameters key to the safe operation of the plant (ie, temperature, pressure, flow, etc.)
	  ○ Safety devices critical for safe operation of the plant, including but not limited to any condition/alarm which results in the shut-down of the plant.
		☐ Yes
		☐ No
		☐ N/A	

Appendix B. Plant Safety and Management Program

	General	Incl.	Auditor Notes
1.	**Cover page(s)** Do cover or introductory pages contain the following: • organization's name, logo (if applicable), and physical address; • issue date; • edition; • revision level.	☐ Yes ☐ No ☐ N/A	
2.	**Table of Contents, Revision History, and Defined Terms** • a table of contents listing the documents sections. • a table that tracks the revision history; and • a table of definitions (glossary) for all abbreviated titles and/or terms used frequently within the program documentation.	☐ Yes ☐ No ☐ N/A	
3.	**Document Control** • Have the program documentation control practices been adequately described, includes provisions for revision, distribution, and implementation? • Have the controls been defined to indicate the person/s responsible for document control, including submittal of revisions to Technical Safety BC for review, when required?	☐ Yes ☐ No ☐ N/A	

	Note: Changes to program documentation are only required to be submitted to Technical Safety BC for acceptance when they have a material impact on program.		
4.	**Statement of Authority and Responsibility** • Has a written description of the authority and responsibilities of the person(s) in charge of the plant been provided? • Is there wording to suggest that those in charge, have the freedom to identify non-compliances and to take corrective actions, including shutting down the plant if needed, with the full support of management? **Note:** The highest authority noted on the organizational chart must sign the Statement of Authority and Responsibility.	☐ **Yes** ☐ **No** ☐ **N/A**	
	Organization Chart, Job Descriptions & Plant Personnel	**Incl.**	**Auditor Notes**
5.	**Organization Chart & Job Descriptions** • Has there been an organizational chart provided showing the reporting relationships and lines of communication between management, chief engineer/person in-charge, plant operating personnel and Technical Safety BC? • Are documented job descriptions (duties and responsibilities) of key personnel whose performance affects the operation and management of the plant available?	☐ **Yes** ☐ **No** ☐ **N/A**	
6.	**Chief Engineer / Primary Person in Charge** • Has the plant owner designated a chief engineer/primary person in charge in writing who will be responsible for the operation and maintenance of a plant and for ensuring that all regulated work in the plant is performed by appropriately qualified persons? **Note:** This individual must possess the appropriate class of certificate of qualification for the type and size of the plant. **Note:** If the chief engineer / person in charge leaves the position or is unable to perform their duties for an extended period of time, the plant owner must inform Technical Safety BC of their replacement.	☐ **Yes** ☐ **No** ☐ **N/A**	

7.	**Plant Operating Personnel and Shift Schedules**
	• Is there a list available and maintained of all plant operating personnel (power engineers, operators, and safety awareness certificate holders), which includes:
	  ○ each individual's certification number, class and expiry date, and
	  ○ a description of their tasks and where and when they perform those tasks.
	Note: In addition, a plant supervision shift schedule should be maintained to ensure adequate coverage can be provided.
		☐ **Yes**
		☐ **No**
		☐ **N/A**	

Operating and Maintenance Procedures		**Incl.**	**Auditor Notes**

8.	**Standard Operating Procedures**
	• Are all operating activities supported by documented safe operating procedures including but not limited to:
	  • start-up and shut down.
	  • routine plant assessment and safety device testing.
	  • remote monitoring change-over.
	  • remote monitoring notification / call-out procedure.
	  • Emergency shut down procedure.
	Note: The plant management in consultation with the person in charge should develop these procedures. These procedures must be document controlled and made available to all plant operating personnel.
		☐ **Yes**
		☐ **No**
		☐ **N/A**	

9.	**Maintenance, Testing, and Inspection Procedures** • Have maintenance, testing and inspection procedures been developed to establish an effective 'preventative oversight program' for the plant? **Note:** Maintenance, testing and inspection activities must be developed in compliance with adopted codes and standards, manufacturers recommendations and industry best practices (ie,, ASME CSD-1, NBIC, ASME Section VI, / VII and CSA B51 / B52).	☐ **Yes** ☐ **No** ☐ **N/A**	

	Have the following items been addressed in the maintenance, testing and inspection procedures: • Procedures have been documented, reviewed, and approved in writing. • Procedures list all required maintenance, inspection, and testing activities including their frequency (daily, weekly, monthly, etc.). • Procedures clearly define those responsible for the performance of the maintenance, inspection, and testing activities (ie,, in house for routine maintenance and minor repairs or by licensed contractor as service provider). • Procedures include provisions for promptly initiating corrective action in the event of non-conformance or malfunction of any equipment. • Procedures include traceable identification for all units, safety devices, valves and piping systems. **Note:** activities must only be performed by individuals who are trained, qualified, licensed (when applicable) and competent to complete the activity.	☐ **Yes** ☐ **No** ☐ **N/A**	
10.	**Annual Service Report** • Does the program include provisions for ensuring the required annual service reports are obtained and maintained on site in accordance with document and records retention requirements? **Note:** For plants employing boiler or refrigeration safety awareness certificate of qualification holders, the owner is responsible for obtaining, and keeping at the premises, an annual service report from a licensed boiler contractor in accordance with section 80 and 81 of the regulation. **Note:** This annual service report must confirm that any work that has been carried out within the plant has been done in accordance with the manufacturers' specifications and the requirements of the regulation.	☐ **Yes** ☐ **No** ☐ **N/A**	
	Training program	**Incl.**	**Auditor Notes**
11.	• Has a detailed written training program been developed that at a minimum addresses the following requirements:	☐ **Yes**	

	• Provides detailed training in all required areas to assure the safe operation of the plant and execution of the individuals specific role within the plant? This may include, but is not limited to: ○ Plant roles and responsibilities ○ Role specific expectations ○ Standard Operating procedures ○ Maintenance, Testing, and Inspection Procedures ○ Emergency response plans ○ Incident reporting ○ Exposure control plans ○ Available safety and awareness programs (ie,, ammonia safety awareness) **Note:** It is the responsibility of the owner to ensure all individuals who perform regulated work maintain current knowledge and are appropriately trained, qualified, and competent for the activities they are assigned to perform.	☐ **No** ☐ **N/A**	
	• Are there provisions for training on new technical and regulatory requirements when changes are made to the plant, plant safety and management program, codes, and/or regulations?	☐ **Yes** ☐ **No** ☐ **N/A**	
	• Are there provisions for review of training program for continual improvement.	☐ **Yes** ☐ **No** ☐ **N/A**	
	• Are there provisions for the frequency at which the training will be provided to staff including all new hires prior to being assigned responsibilities within the plant, and all existing staff on a periodic basis?	☐ **Yes** ☐ **No** ☐ **N/A**	
	• Are there provisions for record keeping of all staff training including training material, trainee, trainer and date training was provided?	☐ **Yes** ☐ **No**	

		☐ N/A	
Emergency preparedness		**Incl.**	**Auditor Notes**
12.	• Is there a written description of the plants' emergency preparedness plans and activities available? These may include but are not limited to: ○ Emergency rescue plan. ○ Emergency evacuation procedures. ○ Periodic review and drill program. ○ Emergency shut down procedure. ○ Emergency contacts and response time. ○ Notification and evacuation plans if surrounding areas/properties have the potential of being affected.	☐ Yes ☐ No ☐ N/A	
Documentation and records		**Incl.**	**Auditor Notes**
13.	• Are records of plant operations and maintenance maintained to document all regulated work performed within the plant? **Note:** The owner must develop processes to maintain plant related records and documentation for a period as required by the regulation. Specific records to be maintained within the plant and referenced in the program.	☐ Yes ☐ No ☐ N/A	
	• Are operation and maintenance records maintained through a hardbound logbook or, in lieu of a hardbound book, an electronic log? • If an electronic log is utilized, does it provide a permanent and accurate record and is it protected against damage or alteration? **Note:** White out liquids or tapes should not be used to correct a note, instead, cross out the incorrect note, initial beside it, and supply replacement note and only certificate of qualification holders such as power engineers, licensed boiler contractors, and / or plant management can make entries into the logbook.	☐ Yes ☐ No ☐ N/A	
	• Does the work log document all operational activities including but not limited to, start and end times of shift, shift activities, confirmation of completion of rounds?	☐ Yes ☐ No	

		☐ N/A	
	• Does the work log document all maintenance activities including but not limited to, name and license number of contractor, summary of activities performed, and available at the plant premises, preferably in the equipment room?	☐ Yes ☐ No ☐ N/A	
	• Does the work log have provisions to capture the start and end of each shift that is signed by the shift engineer, and the daily activities are being countersigned by the chief engineer of the plant?	☐ Yes ☐ No ☐ N/A	
	• Does the work log include the names and sample signature of all employees who are authorized to make entries into the log, and are the entries made in a legible manner that includes the individual's name and /or initials?	☐ Yes ☐ No ☐ N/A	
	• Is there a plant diagram/drawing available showing equipment and valve tags. **Note:** The physical piping should show flow directions and indication of fluids contained within.	☐ Yes ☐ No ☐ N/A	
Incident reporting		**Incl.**	**Auditor Notes**
14.	• Does the program provide information on the organization's procedures for the management and reporting of any incidents to Technical Safety BC including: ○ responding to and managing incidents, and ○ documenting and reporting incidents to Technical Safety BC **Note:** All plant personnel must be made aware of reporting methods to Technical Safety BC.	☐ Yes ☐ No ☐ N/A	
Continual improvement		**Incl.**	**Auditor Notes**
15.	• Has a description of the processes and/or procedures that will be used to ensure the program remains current and up to date been included? This may include but is not limited to:	☐ Yes ☐ No ☐ N/A	

	○ Periodic review/audit of the program to ensure changes in operational procedures, personnel, roles, and responsibilities, etc. are captured. ○ Periodic review/audit of regulatory documentation to ensure the latest updates in codes, regulations, information bulletins, directives and safety orders are captured and communication to plant personnel.		

Additional Notes

Appendix D: Definitions from the Power Engineers, Boiler, Pressure Vessel, and Refrigeration Safety Regulation

Boiler

A vessel in which, by the application of heat,

a) gas, steam or vapour is capable of being generated and pressurized, or
b) a liquid is capable of being pressurized or heated and includes fittings

and includes fittings and boiler external piping associated with the vessel.

Fluid Heating Plant

A heating plant that heats fluid without vaporizing the fluid.

General Supervision Status Plant

A plant for which the supervision of boilers, pressure vessels or refrigeration equipment is carried out in accordance with the requirements set out in section 55 and the technical and administrative specifications required by a provincial safety manager.

Heating Plant

a) a boiler in which steam or other vapour may be generated at a pressure not exceeding 103 kPa, or
b) a boiler, other than a low-temperature, low-pressure boilers, in which water or an aqueous solution may be heated to a pressure not exceeding 1 100 kPa or a temperature not exceeding 121°C.

High Pressure Steam Plant

An assembly of one or more boilers and includes ancillary equipment, the pressure piping system and a pressure plant, in which steam or vapour is generated at a pressure greater than 103 kPa.

Steam Heating Plant

A heating plant that generates steam or vapour

Low Pressure Thermal Fluid Plant

An assembly of one or more thermal fluid boilers that do not contain an expansible fluid and are protected with temperature control and safety devices that will not permit the boilers to continue to operate should the temperature rise to or above the vapour point of the contained thermal fluid at atmospheric pressure.

Low Temperature, Low Pressure Fluid Plant

An assembly of one or more boilers, including ancillary equipment, that contain liquid and operate at a working pressure of 206 kPa or less and a temperature of 100°C or less.

Person in Charge

The power engineer, operator or other individual present on the premises during a period of time, and designated by the owner or chief engineer to be responsible for and in control of the plant while it is in operation.

Power Plant

A high pressure steam plant or a high pressure thermal fluid plant or a high temperature high pressure fluid plant.

Public Assembly Occupancy Premises

Premises in which persons congregate for civic, political, educational, religious, social or recreational purposes.

Refrigeration plant

An assembly of refrigeration equipment and includes a pressure plant connected to it.

Risk Assessed Status Plant

A plant for which the supervision of boilers, pressure vessels or refrigeration equipment is done in accordance with the requirements set out in section 56 and the technical and administrative specifications required by a provincial safety manager.

Steam Heating Plant

A heating plant that generates steam or vapour.

Unfired Plant

A plant where heat from gas, steam or vapour or other heating medium is supplied to heat exchangers or used directly for the purpose of heating a facility or a process without combustion of a solid, liquid or gaseous fuel taking place on the premises.