

Overview of BPVOE Program

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Presentation to ORFA – Spring Facilities
Operational Forum

May 1st, 2023



Putting Public Safety First



Agenda

- What is the Technical Standards and Safety Authority (TSSA) and what do we do
- TSSA Ice Sheet Refrigeration Plant Advisory

What's TSSA all about?

Purpose: To promote and enforce public safety

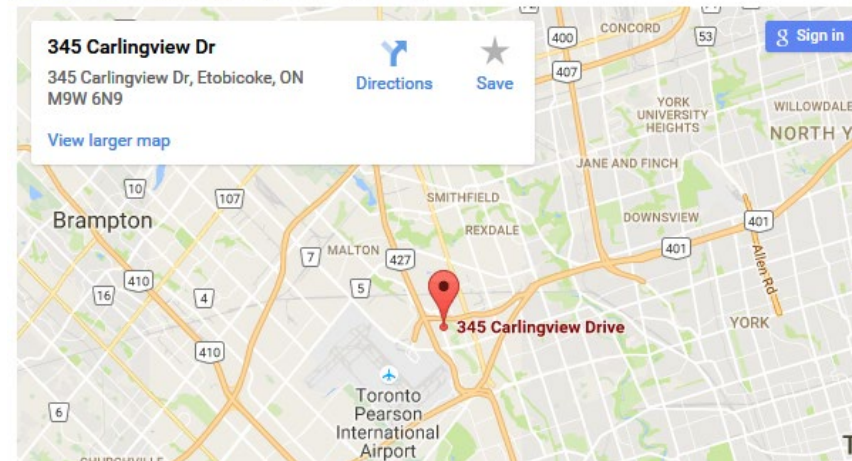
- TSSA is a not-for-profit, self-funded organization dedicated to enhancing public safety.
- Since 1997, TSSA has delivered public safety services on behalf of the Ontario Government, the residents of Ontario and its other stakeholders, in four key sectors:
 - boilers and pressure vessels, and operating engineers;
 - elevating devices, amusement devices and ski lifts;
 - fuels; and,
 - upholstered and stuffed articles.
- TSSA employs over 400 staff across Ontario, of which approximately 70 percent work in operations.

TSSA Head Office Relocation

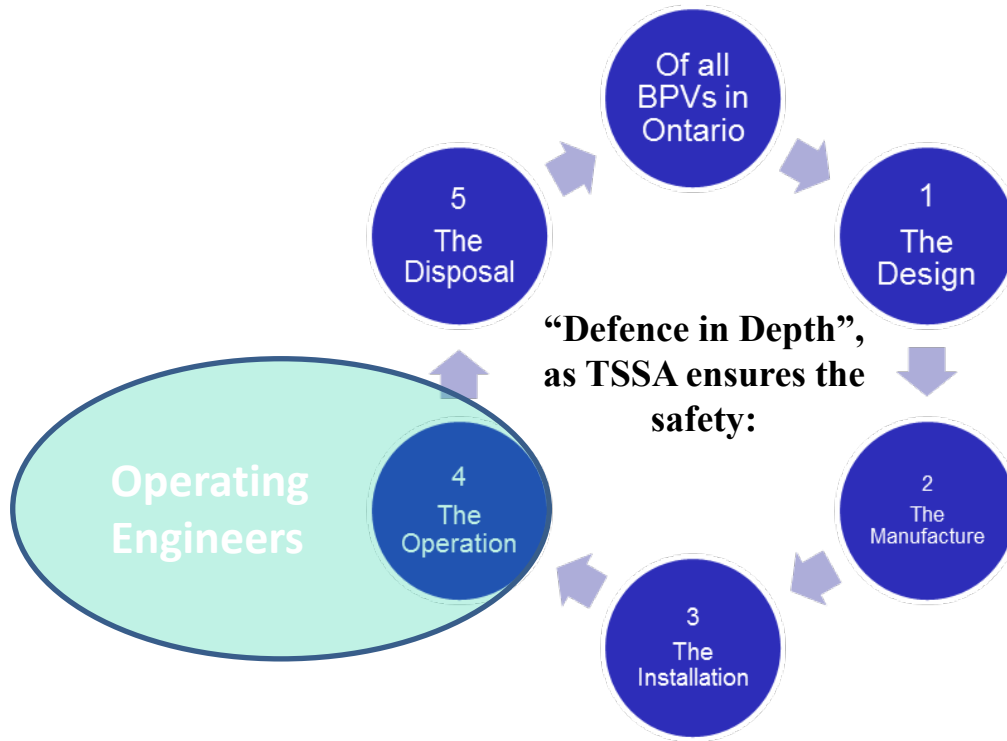


TSSA's head office is now located at:
345 Carlingview Drive
Toronto, ON M9W 6N9
(North of Hwy. 401 / East of Hwy. 427)

Questions or concerns?
Please contact us (toll-free) at
1-877-682-8772 



What's BPVOE all about?



What are BPVs?

- **High Pressure Power Boilers (10%)**
 - Power generation plants
 - Industrial processes
- **Low Pressure Heating Boilers (15%)**
 - Heating plants
- **Unfired Pressure Vessels (75%)**
 - Air receivers
 - Steam generators
 - Refrigeration
 - Fuel processing (CNG, LNG)
 - Refineries
 - Sterilizers, autoclaves

BPVs are everywhere – but unseen

What's Different between BPV and OE?

Overlap between BPV and OE:

- BPV responsible for pressure objects: i.e. **Boilers**: focus is on hardware
- OE responsible for safe operation of pressure systems (*which contain pressure objects*): i.e. **Plants**: focus is on people

Periodic Inspections:

- BPV: 1, 2, 3 years depending on type of high, medium, low risk device
 - Performed by **TSSA or Insurer**; inspect condition of object
- OE: 6, 12, 24 month depending on risk derived from previous inspections
 - Performed by **TSSA only**; inspect operation, maintenance & staffing of Plant

Fundamental Requirements from BPVOE

All ORFA members who have ammonia refrigeration plants are legally required to have a current Certificate of Inspection (COI) in order to operate the Plant

These COIs historically came from your insurer after a periodic inspection (if not insured, then they came from TSSA). This has now changed.

Plants > 30 BHP (22 kW) need to be registered with OE, and periodically inspected (OE checks to ensure current COI in place among other things) (> 200 BHP (indirect) needs to be attended)

Advisory Councils

Meet Twice/year

Plus Risk Reduction Group meetings

Primary mission – bi-directional communication

BPV Advisory Council

13 members

- Manufacturers
 - Refrigeration Rep – Hillar Prits - CIMCO
- Owner/Users
- Contractors
- Insurers
- Associations

OE Advisory Council

9 members

- Power generation
- Industry
- Training provider
- Associations
- Refrigeration (Randy Purves - J.D.Sweid Foods)

See [web site](#) for membership details

OE Program Status



Putting Public Safety First



OE Certificate Holders

(17 Oct 2018)

| Certificate Holder | Active | | | | Pending Renewal | | | |
|-------------------------|-----------|--------|-------------|-----------|-----------------|--------|-------------|-----------|
| | Number | | Average Age | | Number | | Average Age | |
| | This Year | Change | This Year | Last Year | This Year | Change | This Year | Last Year |
| 1 st Class | 647 | -7 | 60 | 60 | 20 | -8 | 68 | 65 |
| 2 nd Class | 1,942 | -81 | 57 | 57 | 119 | +28 | 64 | 63 |
| 3 rd Class | 3,040 | +51 | 48 | 50 | 208 | +37 | 57 | 59 |
| 4 th Class | 3,259 | -10 | 46 | 46 | 277 | -10 | 51 | 50 |
| Compressor Operator | 396 | -13 | 53 | 54 | 35 | -18 | 58 | 59 |
| A Operator | 274 | +10 | 54 | 53 | 8 | -4 | 50 | 62 |
| B Operator | 2,019 | +5 | 52 | 51 | 128 | -17 | 54 | 55 |
| Steam Traction Operator | 172 | +6 | 61 | 61 | 5 | -6 | 70 | 56 |
| Total | 11,749 | -39 | 51 | 54 | 800 | +2 | 56 | 59 |

What Plants are in Ontario?

(as of 1 Oct 2018)

| Count of OE Plants | | Staffing | | | | | | | | |
|---|--|---|-----------|-----------|------------|------------|------------|---------------------|--------------|--------------|
| Plant Type | | 1st Class | 2nd Class | 3rd Class | 4th Class | A Operator | B Operator | Compressor Operator | Unattended | Grand Total |
| <ul style="list-style-type: none"> 3,248 total plants 137 1st Class Plants 1,210 Refrigeration Only | | <ul style="list-style-type: none"> 2,550 (79%) Unattended 65 Compressor Plants 184 attended R Plants | | | | | | | | |
| STEAM PLANT | | 13 | 14 | 24 | 96 | | | 1 | 1,077 | 1,225 |
| REFRIGERATION PLANT | | | | | | 44 | 140 | | 1,026 | 1,210 |
| POWER PLANT | | 124 | 41 | 19 | 37 | 38 | 67 | 2 | 406 | 734 |
| COMPRESSOR PLANT | | | | | | | | 29 | 36 | 65 |
| HOT WATER PLANT | | | 2 | 1 | 3 | | | | 5 | 11 |
| STEAM PRIME MOVER PLANT | | | 1 | 2 | | | | | | 3 |
| Grand Total | | 137 | 58 | 46 | 136 | 82 | 207 | 32 | 2,550 | 3,248 |

What Plants are in Ontario? (as of 1 Oct 2018)

| Count of OE Plants | Plant Function | | | | | | | | | | | |
|-------------------------|--------------------------------|---------------------|----------------------------|-------------------------------|--------------|---------------|-------------------|----------------------|-----------------|------------------|------------------|--------------|
| Plant Type | 01 - Power Producers/Utilities | 02 - Petro/Chemical | 03 - Production Industries | 04 - Manufacturing Industries | 05 - Medical | 06 - Academic | 07 - Food Process | 08 - Public Services | 09 - Commercial | 10 - Residential | 11 - Agriculture | Grand Total |
| STEAM PLANT | 9 | 47 | 284 | 297 | 52 | 173 | 103 | 44 | 142 | 30 | 44 | 1,225 |
| REFRIGERATION PLANT | 7 | 10 | 5 | 110 | 11 | 28 | 75 | 909 | 39 | 13 | 3 | 1,210 |
| POWER PLANT | 50 | 36 | 30 | 139 | 127 | 43 | 219 | 43 | 30 | 8 | 9 | 734 |
| COMPRESSOR PLANT | 4 | 50 | | 9 | | | 1 | 1 | | | | 65 |
| HOT WATER PLANT | 2 | | 2 | | 2 | 3 | | 1 | | 1 | | 11 |
| STEAM PRIME MOVER PLANT | 2 | 1 | | | | | | | | | | 3 |
| Grand Total | 74 | 144 | 321 | 555 | 192 | 247 | 398 | 998 | 211 | 52 | 56 | 3,248 |

What Plants are in Ontario? (as of 1 Oct 2018)

| Count of OE Plants Plant Type | Plant Risk | | | Grand Total |
|----------------------------------|------------|------------|--------------|--------------|
| | High | Medium | Low | |
| STEAM PLANT | 39 | 362 | 824 | 1,225 |
| REFRIGERATION PLANT | 18 | 202 | 990 | 1,210 |
| POWER PLANT | 36 | 173 | 525 | 734 |
| COMPRESSOR PLANT | | 23 | 42 | 65 |
| HOT WATER PLANT | | 1 | 10 | 11 |
| STEAM PRIME MOVER PLANT | | | 3 | 3 |
| Grand Total | 93 | 761 | 2,394 | 3,248 |

What Plants are in Ontario? (as of 1 Oct 2018)

| Count of OE Plants Plant Function | Plant Risk | | | Grand Total |
|--------------------------------------|------------|------------|--------------|--------------|
| | High | Medium | Low | |
| 01 - Power Producers/Utilities | 1 | 14 | 59 | 74 |
| 02 - Petro/Chemical | 2 | 36 | 106 | 144 |
| 03 - Production Industries | 13 | 81 | 227 | 321 |
| 04 - Manufacturing Industries | 16 | 175 | 364 | 555 |
| 05 - Medical | 9 | 38 | 145 | 192 |
| 06 - Academic | 8 | 51 | 188 | 247 |
| 07 - Food Process | 15 | 128 | 255 | 398 |
| 08 - Public Services | 20 | 120 | 858 | 998 |
| 09 - Commercial | 5 | 80 | 126 | 211 |
| 10 - Residential | | 26 | 26 | 52 |
| 11 - Agriculture | 4 | 12 | 40 | 56 |
| Grand Total | 93 | 761 | 2,394 | 3,248 |

OE Report Recommendations

OE Expert Panel Report – 25 Recommendations plus others

Topic A: Reducing undue burden on business

Topic B: Encouraging innovation

Topic C: Improving regulatory clarity

Topic D: Improving regulatory compliance

Topic E: Addressing an inadequate labour supply

Topic F: Modernizing the operating engineer certification system

Topic G: Improving public knowledge of the operating engineer profession

Key change includes a recommendation to adopt risk-based regulation which provides industry with two compliance paths:

- Path 1 category-based requirements based on the risk rating of plants
- Path 2 where plants will implement site-specific risk safety management plans (RSMPs)

A task group set up by TSSA and MGCS has completed developing the frameworks for Path 1 and Path 2 regulatory approaches

Path 1 & Path 2 Status

June 28, 2018

Operating Engineers Regulatory Review

Risk-Based Regulatory Framework for
Plant Rating and Attendance – Path 1

Prepared by the Operating Engineers Risk Task Group
for the Technical Standards and Safety Authority

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Operating Engineers Regulatory Review

Regulatory Framework for Path 2 Risk Safety
Management Plans (RSMP)

June 28, 2018

Prepared by the Operating Engineers
Risk Task Group for the Technical
Standards and Safety Authority



CAN/CSA-Z767-17
National Standard of Canada
(approved August 2017)

Process safety management



Standards Council of Canada
Conseil canadien des normes

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Alternative Rules Application

- Negligible impact on ORFA members anticipated
- TSSA has and will continue to consider ORFA training as part of an ice sheet refrigeration plant risk based approach to safe operations

TSSA Ice Sheet Refrigeration Plant Advisory



Putting Public Safety First



Improving Safety Through Clarity

- The ORFA reached out to TSSA to consider providing direction on the application of the OE specifically for registered unattended ice sheet refrigeration plants
- The objective would be to clearly define, “owner”, “user”, “operator” and “service contractor” roles and responsibilities as required in the OE

TSSA Responds to ORFA

- TSSA met with ORFA staff on several occasions to explore the issues and possible solutions
- TSSA agreed that providing direction on roles and responsibilities of all stakeholders in respect to OE compliance in the ice sheet industry would be beneficial and contribute to improved public safety

Ice Sheet Attended Plant

- Chief Operating Engineers responsible for attended ice sheet refrigeration plants are encouraged to consider the information in the Advisory as part of their ongoing efforts to improve safe plant operations

TSSA Advisory Explained

TSSA has a variety of options to improve public safety

- An Advisory is a tool that provides unrestricted direction to plant owners, users, and operators based on minimum compliance standards

No Change to the OE

- It is important to understand that there is no change to the O. Reg. 219/01: OPERATING ENGINEERS REGULATION
- It remains the obligation of plant owners, users, and operators to review the OE and apply requirements specific to the registered refrigeration plant room

TSSA & ORFA Agree

- A standard ice sheet refrigeration plant will require a minimum of 1.5-million-dollar capital investment by the owner
- Maintaining these investments requires competent and qualified staff
- Aging plants present additional risks that need to be managed

Job Descriptions

The ice sheet refrigeration industry has significantly evolved with new technologies, equipment, and refrigerant options

Plant owners and users must design job descriptions that reflect the on-site refrigeration plant as well as heating, air conditioning, ventilation and dehumidification systems as each component can impact the refrigeration systems operation and safety

Plant Owner

Owner

The plant “owner” is “the person to whom or which the plant is registered but does not mean the operating engineers or operators who operate, control, or maintain the plant”. The plant owner selects an individual to have the authority to ensure the plant is being properly operated, supervised, and managed. [s. 1 (1)]

Plant User

The plant “user” is the person selected by the plant owner to be responsible for ensuring that the plant is being properly operated, supervised, and managed

The regulation clarifies that “user includes the person or persons in control of a plant as owner, lessee or otherwise, but does not include the operating engineers or operators who operate, control, or maintain the plant”

The plant user will often have authority to oversee equipment maintenance or replacement and the training of plant employees.

CSA B-52 MRC

Beyond the OE, the plant user should have a strong working knowledge of the CSA B-52 Mechanical Refrigeration Code (MRC) and other applicable codes, standards and practices associated with safe work practices, environmental responsibilities, and emergency management.

Operational Management

- It is the plant “owner and/or user” obligation to ensure that the registered unattended ice surface refrigeration plant is under the care and control of well-trained, competent, responsible persons at all times
- Plant employee training programs design, delivery and supervision remains a plant “owner and/or user” responsibility

Training and Operational Best Practices

- TSSA recommends that the plant “owner and/or user adopt industry recommended training and operational best practices, guidelines and/or standards for training registered ice surface refrigeration employees
- These are obtainable through Ice Sheet industry training providers

Role of the Service Contractor

- While service contractors play an important role in ensuring safe plant maintenance and operations, it ultimately remains the plant owners and/or user's responsibility to ensure that a plant is properly maintained
- “The plant “owner and/or user” is responsible to select, direct and supervise any service contractor who performs work on the primary or auxiliary equipment, safety devices, and/or emergency systems”

Site Specific Maintenance Plan

- The maintenance plan for the plant needs to be site-specific, based on the condition of the equipment, plant design and layout, and should include an asset management plan

Holidays and Seasonal Closure Inspections

The plant owner and/or user is responsible for ensuring that any unattended guarded plant remains safe during holidays and extended periods of closure through regular, recorded inspections by competent personnel

Unattended Plant Procedure Training and Emergency Manual

- All refrigeration plants must be operated and maintained to the standards of equipment owner manual maintenance programs and regulated responsibilities
- Procedure manuals guide current and future users and employees and service contractors in the safe operation, supervision, and management of the plant
- The manual must set out procedures relating to training of all persons selected by the plant user to assist in the safe operation, supervision, and management of the plant

Plant Emergency Plan

- The manual should include emergency plans for the plant relevant to the associated risks of operation and refrigerants
- Key areas of focus should include chiller life/condition, compressor maintenance, safety valve servicing, modification/repairs to piping system, testing of the secondary coolant, emergency relief lines and valve exercising programs
- Failure to have and maintain a plant procedure and maintenance manual may result in an unattended plant becoming an attended plant status requiring certified staff until such information is put in place

Logbooks

- Section 37 of the regulation contains detailed requirements regarding logbooks
- Logbooks are an important part of a plants operational and maintenance plans as they collect and store data on the health, risks and hazards associated with the plant
- Maintaining both operational and supplementary logbooks that meet industry standards is strongly recommended

Unattended Plant Asset Management Plan

- TSSA recognizes the benefit of refrigeration plant asset management as it tracks life expectancy and replacement of all key pieces of refrigeration equipment, infrastructure, and safety devices
- Having and maintaining an asset management plan that meets industry best practices is recommended

Recognizing the Role of ORFA

- Compliance to any regulatory requirement requires skill and training specific to the work environment
- TSSA recognizes the efforts of ORFA to set levels of minimum competency through industry best practice
- TSSA is aware of the voluntary skills, training and professional certification pathways offered by the ORFA and may use them to evaluate ice sheet refrigeration operations
 - TSSA Inspectors are provided ORFA training as part of their ongoing professional development

**Thank You for this opportunity to share.
Any more Questions?**

