

# PRESSURE NEWS

A quarterly publication brought to you by ABSA, the pressure equipment safety authority.

VOL. 27, ISSUE 4 - WINTER 2022

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## PRESIDENT & CEO'S YEAR-END MESSAGE



**Mike Poehlmann**  
President and Chief Executive Officer

ABSA's top priority is the safety of the public, our employees, and the people who work around pressure equipment on a daily basis. We are proud that our services support the Alberta pressure equipment industry's continued efforts for effective integrity management of their equipment and ensuring the safety of their workers.

This year, we received 233 unsafe condition, accident, and fire reports. Fortunately no fatalities were reported, but five workers were reported injured. In one incident, three workers sustained burns caused by the release of steam from a failed piping component. Two workers sustained burns in flash fires in separate incidents during maintenance activities at hydrocarbon processing facilities.

In terms of workplace safety, ABSA employees had one lost-time injury from which the employee made a full recovery, and one vehicle accident which resulted in no injuries. Our Health and Safety Program was subject to an annual audit under the 'Partners in Injury Reduction' program this year and the Certificate of Recognition was renewed.

The public health emergency of the COVID-19 pandemic has waned, and after two full years of being closed to the public, ABSA reopened its offices on 16 March. Similar to many workplaces, we have not returned to the way things were. We continue to adapt to current circumstances. Most of ABSA's office workers continue to work from various hybrid arrangements. We have committed to holding off on a permanent decision regarding remote work until Spring 2023 to obtain sufficient knowledge surrounding impacts these work arrangements may have on our service delivery and corporate culture going forward. We call it the "New Abnormal" which we know has affected our employees as it has society at large. We established a mental health

awareness campaign to support our employees and we continue to create safe spaces for employees to participate in decisions for next steps forward.

A highlight of 2022 was the ABSA Gala which was an in-person event hosted in Edmonton to recognize long term service and retirements that occurred during the last few years when it was not possible to meet in person. The event was well attended and enjoyed by employees, retirees' families and Board members.

Throughout the year ABSA's revenues gradually returned to near pre-pandemic levels. ABSA's activity levels, particularly in the areas of design registration and new construction inspections, typically trend up and down in step with energy prices. However, during this unusual year, the continuing economic uncertainty and constraints on material and labour seem to have dampened the effect of increasing energy prices on pressure equipment construction activity. Despite these uncertain economic times, we remain confident in our ability to adapt to future conditions and continue to provide excellent service.

We made some organizational changes this year which are intended to support ABSA's future operational needs. Top management was restructured with redistribution of accountabilities and responsibilities. As well, the employee complement, reduced during 2020 with a significant number of retirements, was increased with new hires in all departments. We continue to maintain our certification for our ISO 9001:2015 quality management system. Our quality management system continues to mature; as such we have established a Quality Manager to join our management team. We increased the scope of our ASME Authorized Inspection Agency accreditation with the addition of Section III Division 5 High Temperature Reactors to be ready to support Alberta manufacturers that have expressed interest in pursuing this type of construction.

We implemented our first fee increase since January 2013. ABSA's focus on cost efficient operations had allowed us to offset fee increases, however the effects of inflation caught up with us and we increased fees by 7.1% in September for core services and March 2023 for annual vessel fees.

ABSA is grateful for its knowledgeable, competent and dedicated staff, and is also very fortunate to have a dedicated and committed Board of Directors. Their strategic guidance is greatly appreciated by management and staff. With our stable, well-experienced workforce and the strong support of our Board, Alberta Municipal Affairs, the Safety Codes Council, and Alberta industry, ABSA is well-positioned to continue delivering its mandate in the years to come. With the conclusion of another unusual year we look forward to better times ahead. All of us at ABSA and our Board of Directors would like to take this opportunity to wish you all the best for this holiday season, and a healthy, safe, and prosperous New Year.

### Welcome to the fully redesigned Pressure News!

If you have any questions please reach out to us at [communications@absa.ca](mailto:communications@absa.ca).

### Let us know what you think!

Scan the QR code below with your phone camera to fill out a quick survey!



## 2022 YEAR-END REVIEW OF ACCIDENTS

ABSA's mandate is to administer the Safety Codes Act and associated regulations, and to deliver safety programs as they relate to pressure equipment. ABSA's ultimate quality objective is to prevent injury to people and damage to property arising from the operation of pressure equipment. When incidents do occur, a thorough investigation can help us learn from past mistakes, decreasing the likelihood of repeating an accident.

There were 233 reports submitted to ABSA from November 1st to October 31st, 2022. Unfortunately, this year, there were five injuries to personnel related to pressure equipment safety in Alberta:

- Three workers received burns when an elbow on a steam outlet header ruptured and released steam.
- One worker was burned from fire caused by a release of hydrocarbon from a sampling station
- One worker received minor burns due to a fire caused by the release of hydrocarbon gas.

**Equipment owners are reminded that Alberta law requires that unsafe conditions and accidents related to pressure equipment be reported in a timely manner.**

Information Bulletin IB18-004 Rev 1: Reporting Unsafe Conditions, Accidents and Fires, clarifies the classification of incidents and their specific reporting requirements.

A list of accident and incident summaries are published on ABSA's website at [www.absa.ca](http://www.absa.ca) under the 'Unsafe Condition, Accident & Fire Reporting' menu, by navigating to 'Summary of Unsafe Condition, Accident & Fire Reports'.

## ABSA BOARD OF DIRECTORS - CHANGES IN MEMBERSHIP

ABSA is pleased to announce new members to our Board of Directors. We welcome Mr. Trevor Williams as the Ministerial Appointee representing public safety on our Board. This particular appointment is made by the Minister of Alberta Municipal Affairs.

Trevor Williams is the Interim President, Nitrogen and Phosphorus, at Nutrien Canada. He is responsible for the safe, reliable, and efficient operation of Nutrien's Nitrogen and Phosphate businesses. He has a diverse array of experience leading large scale chemical operations for global companies and the execution of strategic plans to support the growth of the business, its operations and people.

Trevor will be replacing the outgoing Ministerial Appointee, Michelle Colleton, Head of Health, Safety, Security, and Environment at Petronas Canada.

We also welcome Dr. Brad Donaldson as the Education Industry Representative on ABSA's Board. Brad is the President & CEO of Lethbridge College. Brad has extensive senior leadership experience having served as Vice President Academic at Red Deer Polytechnic and SAIT prior to his current role.

Brad will be replacing the outgoing Education Representative, Dr. Neil Fassina, President & CEO of Okanagan College.

Trevor Williams



Michelle Colleton



Brad Donaldson



Neil Fassina



We would like to thank both Michelle and Neil for their contributions to ABSA's strategic leadership and governance.

## 3D + FEA RECONSIDERING PRESSURE EQUIPMENT DESIGN IN ALBERTA

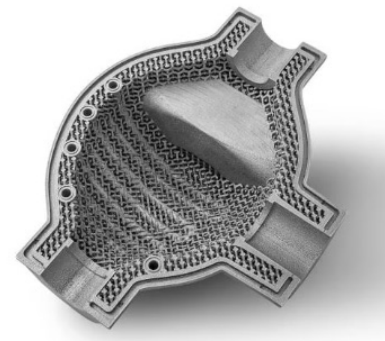
It is evident that additive manufacturing is starting to take an important place in pressure equipment construction. The first certified 3D printed pressure vessel, for up to 220 bar (3190 psi) was successfully constructed and certified (in accordance with European Pressure Equipment Directive (PED)).<sup>1</sup> This certification is a notable milestone for the industry that may use this new technology, specifically because there are, to date, no legislation or global standards specifically for 3D printed pressure retaining parts.<sup>2</sup>

Another example where advances in the 3D-printing may reveal great promise is the ongoing research regarding heat exchangers. We all witness that the overall design of the traditional heat exchanger has not changed in a long time. While some small incremental innovations over the years have

sustained gradual improvements, the overall configurations and sizes that we are familiar with are the same as they are for many decades.<sup>3</sup>

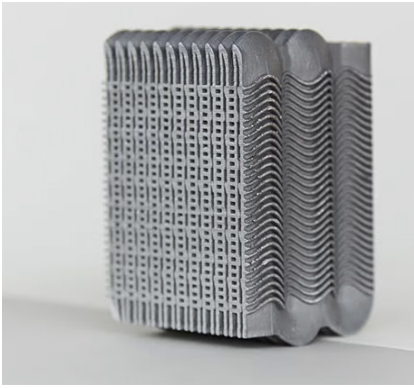
With the approach of using additive manufacturing that can produce any shape, for example, the possibilities of heat-exchanger configurations are vast. This combined with the use of finite element analysis (FEA) may provide an opportunity to quickly evolve the design, thus identifying the best shapes and configurations. The industry may discover that some of the classical assumptions based on traditional designs may need to be reconsidered and revised. Some researchers were surprised by findings that temperature redistribution was incredibly complicated.<sup>4</sup> Therefore, it would be impossible for a human to innovate the ideal design without utilizing a combination of 3D shapes and FEA. Such research has revealed

3D-printed heat exchangers exhibit the superiority of such new designs, both in sizing and weight and in demand for power to drive the fluid through the exchanger.



3D printed heat exchanger by FIT AG (Source: FIT AG)

1 Meteorology News. (2022). "3D Printed Pressure Vessel Receives CE Certification". *Meteorology News*.  
 2 Shell Global. "CE Certification of a 3D Printed Pressure Vessel". *3D Printed in Energy Industry*.  
 3 Abrams, M. (2022). "Rethinking and Redesigning Heat Exchangers". *ASME The American Society of Mechanical Engineers*.  
 4 Goguelin, S. (2021). "Better Heat Exchangers with Additive Manufacturing". *AI3DP*.



3D printed heat exchanger 3T RPD by EOS with Autodesk (Source: EOS)

Current drawbacks of using additive manufacturing technology to design and construct the new components are the cost compared to the construction of using traditional technologies.

There is also issue with the inclusion of additive manufacturing in the established technical codes and standards, as well as in regulatory provisions. This lack of regulations means that the use of 3D-printed pressure equipment is generally not permitted for use around the world and as well in Alberta.

Recognizing the prominent role of 3D technology regarding the degree of rapid innovations and growing rate of cost reductions, it is of no surprise that it is of great interest to the Alberta industry to take some leadership positions in the context of 3D printed pressure components.

ABSA was approached by the industry with a request to coordinate efforts of developing a proposal for a regulatory framework (provisions) on the safe use of additive manufacturing. The process began with leaders in the industry as participant members.

We are confident that these efforts, once again as in the past, will ensure Alberta's leading position in pressure equipment safety. ABSA strives to support the success of people through providing leadership in early technology adoption, through paving the way for regulatory and technological framework to be available for safe use by the Alberta industry, which is often referred to by other domestic and worldwide jurisdictions.

## INTEGRITY ASSESSMENT ORGANIZATION (IAO): CAN I USE THEM?

ABSA has Safety Codes Officers (Inspectors) performing inspections on various types of pressure equipment in Alberta. These Safety Codes Officers receive training from the National Board of Boiler and Pressure Vessel Inspector, trained internally and certified by the Safety Codes Council and the National Board. ABSA inspects all pressure equipment where members of the general public may be in proximity to that equipment and not realize the hazards involved with the operation of pressure equipment. Additionally, ABSA inspects equipment located at small process facilities and repairs and alterations at large process facilities.

### Does that mean that Owners cannot use other Inspectors to inspect their pressure equipment?

Yes and No.

No, for public occupancy equipment, such as laundry mats, schools and shopping centers, this equipment can only be inspected by an ABSA Safety Codes Officer. The primary reason is general public safety; equipment which can affect members of the general population of Alberta cannot be inspected by a private organization.

### Yes, Owners can call upon other Inspectors, under the following conditions:

1. The Inspectors must be employed by an Integrity Assessment Organization (IAO) and trained and qualified for the equipment they intend to inspect.
2. Companies referred to as Integrity Assessment Organizations (IAO) must be registered with ABSA

with a scope of practice detailing what type of work they will be performing.

a. *As provided for under Sections 11(2) and 13(a) of the Pressure Equipment Safety Regulation, the Administrator in the pressure equipment discipline has established that ABSA document AB-515 specifies the types of integrity assessment activities which are required to be carried out by an organization having Certificate of Authorization Permit, and when such a permit is required, it provides further guidance as to the required content of a Quality Management System (including related practices and procedures) in order for it to be acceptable to the Administrator, as required by Section 13(a) of the Regulation. Appendix A of this document provides the criteria for determining whether a Certificate of Authorization Permit is required.*

3. The work being performed must not be related to public occupancy pressure equipment. It is encouraged to contact ABSA if you are unsure whether your equipment is deemed "public occupancy" or not.

4. Owners must enter into an agreement with the IAO so that the IAO can represent you when submitting the inspection findings to ABSA.

5. The only type of work they may perform is what is included in their "scope of work" presented in their manual and performed by a qualified individual.

### Does ABSA recommend Owners to use IAO Inspectors? Absolutely, yes, the reasons are:

- IAOs can perform beyond the minimum inspections and offer a remaining life assessment for Owner's equipment

- Help prepare the vessel for inspections by indicating what needs to be inspected and how it is to be inspected
- Allows Owners to predict repair or replacement strategies
- Offer advice on repairs
- Organize inventory so that Owners know which units need to be inspected and at what intervals
- Allows Owners to schedule inspections in a timely fashion
- The IAO can submit inspections on Owner's behalf to ABSA and advance inspection intervals to the next checkpoint
- In addition, IAOs may offer more services such as "burner management" and water treatment recommendations for boilers
- Help maximize the remaining life on your equipment by offering operational advice along with strategies (internal coatings and/or docking procedures for seasonal operations)
- In some remote locations, it is financially beneficial to use these organizations

Please note that the discussion is limited to the pressure boundary and not to other items such as burner management. ABSA recommends that Owners follow to manufacturer's recommendations in all aspects and seek professional assistance when referring to these items inside and outside the pressure envelope.

Please refer to the ABSA website to find an Integrity Assessment Organization.