



NEWSLETTER

Volume 11 September, 2021

Happy fall to all! We are very pleased to report that it's been another great year for Petr Explosives Group. We have been working hard on our academy of online classes, conference publications and more and are very excited to share some updates. In this special newsletter edition, we have included inspiring interviews with a couple of our graduated students. We would also like to share our new free app, PETS Toolbox, which has unique calculators to help blasters with inventory and blasting calculations. Furthermore, our online PETS license renewal courses are now approved in nine different states!

PETS Toolbox App

Reduce your headaches with explosives magazine inventory. We have developed a FREE mobile application for blasters to help you easily calculate the net explosive weight in your magazine. This unique **calculator** converts the **number of detonators, feet of detonating cord, shock tube, safety fuse, to pounds** for comparison with the **American Table of Distances** and more!

PETS's Toolbox was designed to mitigate any issues with magazine inventories during ATF and State inspections.

- Reduced potential error with calculation
- Reducing error with converting units
- Reporting incorrect quantities in pounds

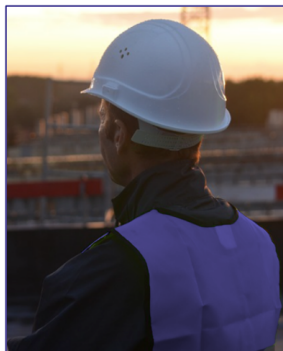
This tool will make your next inspection both easy and comfortable.

Please visit our website to download this PETS toolbox on your mobile device or computer.



Renew Your Explosive License - Nationwide PETS Offerings!

Dr. Vilem Petr has been teaching the Practical Explosives Training School (PETS) course Colorado blasters to renew their license for over 10 years. We thought it was due time to extend our **online license renewal** course offerings nationwide at PetrExplosivesGroup.com. All PETS classes are certified with their respective state and pre-approved to fulfill the continuing education requirement. They are also recognized by industry professional associations including the International Makers of Explosives (IME) and the International Society of Explosive Engineers (ISEE). Here is a current list of our online explosive license/certificate of fitness renewal course offerings.



Alaska | 8-hours {\$325}
California | 8-hours {\$325}
Colorado | 16-hours {\$675}
Hawaii | 8-hours {\$325}
Indiana | 8-hours {\$325}
Kentucky | 8-hours {\$325}
Missouri | 8-hours {\$325}
Washington | 8-hours {\$325}
Wyoming | 8-hours {\$325}

Don't see your state listed? We are working hard to add even more states to our list of pre-approved courses. Please send us an email to get notified when your state becomes available!

Online Course Reviews

Reviews have started coming in for our new online version of our popular Practical Explosives Training School (PETS) class. Check out our most recent review!

Why did you use online class vs. in person?

I chose the online option so I could review this material, outside of work.

What was the most challenging part(s) to finish the class?

The most challenging part was setting aside the time to go over the material covered in the class.

What did you like most about the class?

I enjoyed that you and your team were able to respond to requests outside of working hours.

What other subject should be included in this class?

I think a section on safely handling explosives would be beneficial to everyone.

Would you retake this class?

Yes I would.

Would you recommend this course to others?

Yes I would.



Petr International Explosives Academy Courses

Tier I | Blasters & End Users

- PETS Practical Explosives Training School

Tier II | Academics

- High-Speed Impacts for Explosives & Ballistics Applications (MS&T)
- Special Use of Explosives
- Ultra-High-Speed Imaging & Analysis
- Explosives Engineering I, II & III

Tier III | Special Uses

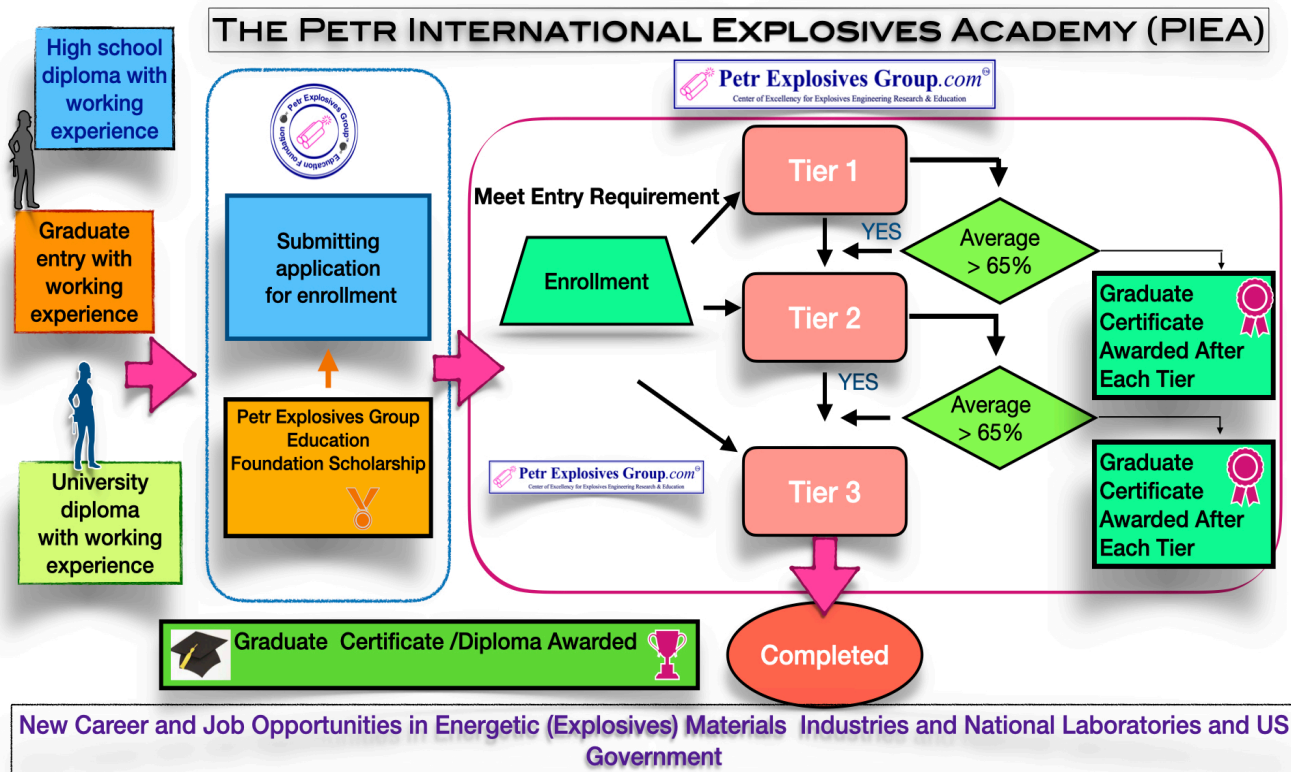
- Avalanche Mitigation
- Industrial Explosive Cleaning & Deslagging for Boilers
- National Forest & Park Services Specialized Practical Training
- Explosive Engineering Workshop
- Secondary Blasting
- Introduction to UXO Removal
- Optimization of Rock Fragmentation

Petr International Explosives Academy Overview

Our **Petr International Explosives Academy (PIEA)™** is a 3-tiered, practical and academic program with both in-person and online course offerings, has been designed to prepare participants with the requisite technological skills necessary for today's generation of blasters, explosive scientists and engineers.

The first tier consists of our certificate short course and is intended for blasters and other end users. The second tier is academic focused and is targeted for students and professionals seeking continuing education opportunities or university credits. The third and final tier is a highly specialized training and focuses on practical and cutting-edge technologies of explosives and related applications. We are also working hard to convert several of our popular classes into online alternatives. The following figure shows an overview of the program structure.

This program is designed to accommodate a broad range of backgrounds, including the new generation who wishes to obtain basic knowledge in explosives science, those interested in applying for a blasting license, and/or students interested in advancing their knowledge or careers. Current full-time students who are working on completing undergraduate or graduate degrees may apply to our Education Foundation Scholarship. This program is fully accredited and certified, and one can complete an 18 credit course in approximately 4 months (one semester), and earn a Diploma. The figure above demonstrates the basic steps needed to apply for each tier of the program to complete and obtain a Diploma. Our unique program offers multiple entry level options, serving a wide range of experience, education, and background. Some examples include, individuals studying for state and federal explosives permits, and students interested in gaining and advancing knowledge in the fundamentals of energetic materials, (explosives, pyrotechnics, propellants) for industrial applications and explosives manufacturers. In addition, experts interested in advancing experience/knowledge in



world-class cutting edge technologies such as high-speed, ultra-high speed, flash x-ray, detonation phenomena, shock wave physics, will obtain the skills and technological tools required to advance in science and engineering fields, for national labs and US government.

Background: During Dr. Petr’s 20-year career at Colorado School of Mines (CSM) as a research professor, he established a Minor Degree in Explosive Engineering and Explosives Processing for undergraduate students, and additionally, established a Special Emphasis Sequence in Energetic Materials, in the Materials Science Department, for students pursuing M.S. and Ph.D degrees in Materials Science.

The Petr International Explosives Academy™ is a novel and groundbreaking program, offering traditional students (pursuing their degrees at their home universities) the opportunity to develop a special niche for their future career.

We will still be continuing to offer our short courses in-person as part of PIEA, Tier 1 and Tier 3, such as Practical Explosives Training School™ (PETSTM), Ultra-High-Speed Imaging for Explosives Engineering, and Vision Research Phantom Academy for High Speed Imaging for Explosive Engineering. Last summer, we had a very successful online class with Missouri University of Science and Technology, with students pursuing a Masters or Doctorate Degree in Explosives Engineering. We will also be collaborating with industry experts to offer their classes as part of our International Explosives Academy™ or independently through our short courses.



PEG Education Foundation Scholarship Opportunity!

Petr Explosives Group's Education Foundation™ is now offering \$20,000 in Explosives Engineering Scholarships for the academic year 2021-22 to undergraduate students, graduate students, and education-seeking individuals who wish to advance their understanding of safety regulations and industry applications via The Petr International Explosives Academy™. To apply for this amazing scholarship opportunity, please visit our website at PetrExplosivesGroup.com.



Upcoming Courses

In-Person Practical Explosives Training School (PETS) | Tier I

PetrExplosivesGroup.com is looking forward to our upcoming Practical Explosives Training School (PETS) 16-hour general explosives courses. This course will be held in-person on November 15-16, 2021 and February 14-15, 2022 in Golden, CO. Registration is now open at <https://petrexplosivesgroup.com/course-registration/>. We recently held two other in-person PETS classes at the Security & Emergency Response Training Center (SERTC) and the Freeport Henderson Mine.

Dr. Vilem Petr has been teaching the PETS course for over 10 years. This course is taught in conjunction with the ATF and the Colorado Department of Labor and Employment Office of Public Safety. We would like to thank the ATF representatives from the Denver Office, including Nathan Johnson as well as the Colorado State Explosives Program representatives, Scott Narreau, Candace Garza, and David Knight for their continued support and upcoming guest lectures during these courses. Industry members were regular attendees at our course, and were able to update their knowledge on the latest explosive practices and regulations, and obtain 16-hours credit toward renewal of their Type 1 Blasters License with the State of Colorado.

Avalanche Mitigation Short Course | Tier III

We are currently working with Purgatory, Vail Associates, Crested Butte and Jackson Hole to provide avalanche mitigation refresher courses to their ski patrol teams for the upcoming winter season. We will also be offering a 4-hour *online* version of this course soon! These courses aim to enhance safety and mission success.



Secondary Blasting Short Course | *Tier III*

Petr Explosives Group has developed an *online* 4-hour short course on the science and practical use of secondary blasting techniques. This course is available now on our website PetrExplosivesGroup.com. Cost: \$90

Explosive Engineering Workshop | *Tier III*

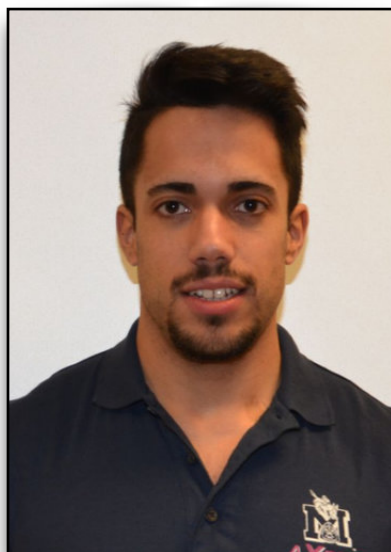
We are currently developing a 4-day workshop on explosive engineering with engineers and scientists from national laboratories and government agencies. It will cover topics including applications, chemistry, numerical modeling, safety & regulations, detonation & shock wave physics, and testing & instrumentation. This workshop will have expert guest speakers and will allow participants to advance their careers and expand their networks. This workshop is expected to be offered in October, 2022. Stay tuned for more information!

For more information about all our upcoming classes or to register for a course, please visit PetrExplosivesGroup.com. We are also happy to develop new specialized trainings specific to your business. To learn more about new course development opportunities, please contact Dr. Vilem Petr at vpetr@petrexplosivesgroup.com.

Petr International Explosives Academy Former Student Interviews

The Petr International Explosives Academy (formally called AXPRO Group) has had the pleasure of teaching many exceptional students throughout the years. For this newsletter issue we have followed up with a couple of our former students to see where they are now and their advice for new, incoming students.

Eduardo Lozano, PhD



What have you been up to since graduating and leaving AXPRO?

I moved to Santa Fe and started working at Los Alamos National Laboratory. I am currently a postdoctoral research associate in the Theoretical Division, T-1 group.

Why did you choose to start in the explosives program/ AXPRO?

I came to Mines as an exchange student from Spain in Fall 2014. One of the courses I signed up for was MNGN333 (Explosives Engineering I) with Dr. Petr. Both the lectures and lab sessions were the main reason why I developed a strong interest in high explosives and their engineering use. After finishing the course, I asked Dr. Petr if he had any openings and he gave me the opportunity to work at



AXPRO. I was a proud member of the team from December 2014 until I graduated in 2020.

What did you like best about the program?

One of my fears about starting Grad School directly after earning my degree was the risk of losing exposure to a professional environment outside academia. This turned out to be the opposite case since AXPRO gave me the opportunity to learn and grow as an engineer while tackling real-world problems. Besides learning from top scientists and engineers, one also has access to world-class facilities and instrumentation that give you the opportunity to develop a unique skill set. But probably what I enjoyed the most was the camaraderie and the work environment with the other members of the team and the students.

How did the undergraduate explosives program/AXPRO help you in your job search and future career?

I have no doubt that it was the knowledge and experience that I acquired during my years at AXPRO that put me where I am today. It is gratifying to look back and have so many good memories and also be proud of the work done.

Did you find the networking opportunities in AXPRO helpful?

In my case were decisive since I first met my current coworkers while I was a grad student working at AXPRO. I also had the opportunity to interact directly with the industry partners that were sponsoring some of the projects and many of the attendees from the short courses. After working one-on-one with them, they won't give you the "apply through our website" answer if you are interested in a job. Not everyone gets that kind of exposure to potential employers during their time in school.

Do you have any advice for new/prospective students starting out in the program?

Find a subject that you like and work hard to become the best at it. But don't forget to have a little bit of fun while you do it.

Erica Nieczkoski, MS

What have you been up to since graduating and leaving AXPRO?

I have moved to California and have been working for the Department of the Navy.

Why did you choose to start in the explosives program/AXPRO?

Explosives engineering is really interesting and the science and shock wave physics behind it is really interesting. It is science that helps to keep people safe and make a difference. I also liked figuring out how things work and why they work. There are so many factors to consider and explore within explosives engineering.

What did you like best about the program?

I liked the hands-on experience You are not just sitting in a classroom





all day. Instead, you get to go to the lab, see things, and set off explosives. There are not many programs in the US in which you can do this, especially at the undergraduate level.

How did the undergraduate explosives program/AXPRO help you in your job search and future career?

Yes, I was able to meet a lot of really interesting people in the industry including CDOT, FBI, ATF, etc. Everyone tried to help me in my career and gave me ideas regarding future career paths and the various applications of explosives.

Do you have any advice for new/prospective students starting out in the program?

It took me a long time to figure out what I liked and what I wanted to do. I jumped through three different programs before finding this one and sticking with it. I had finally found something I really enjoyed and wanted to do. You can mold this program into what you want it to be so that you can go after what you enjoy.

New Team Member



Gary Kirchoff

We would like to give a warm welcome to our newest team member, Gary Kirchoff. Gary is retired ATF and has 30 years of experience throughout Oklahoma, Colorado, Wyoming, and Utah. We are very excited to have him as part of the growing Petr Explosives Group Team!

Conferences & Publications

PetrExplosivesGroup.com will be attending next IPS Seminar in Colorado Springs, Colorado, 2022. During this Seminar we will be publishing and presenting our paper “Experimental Investigation into the Safety Distance for Ethane-Oxygen Gas Explosion Applied to Industrial Cleaning.” We will also be participating in the poster session to outline our unique research and training capabilities. We hope to see you there 2022!

Thank You,

Petr Explosives Group