



# NEWSLETTER

Volume 12    October, 2022

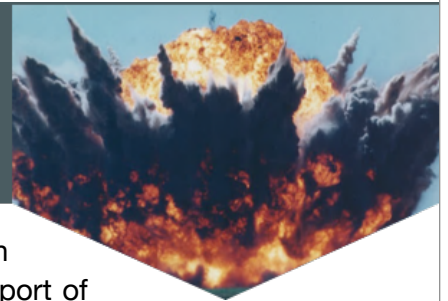
Happy fall to all! We are very pleased to report that it's been another great summer for Petr Explosives Group. We have been working hard on our academy of online classes, conference publications and more and are very excited to share some updates. We published a paper and spoke at this year's International Pyrotechnics Society (IPS) seminar. We also worked several companies in California, Texas, Alabama and Colorado to provide training for their newly hired engineers and technicians who had little to no prior knowledge in explosives. These classes were specifically tailored to each company and helped them to develop a well-rounded understanding of commercial and military use of explosives with an emphasis in new technologies. We would also like to remind everyone about our free app, PETS Toolbox, which now has even more unique calculators to help blasters with inventory and blasting calculations. Furthermore, our online PETS license courses are now approved in eleven different states with even more coming soon, including a version in Spanish!

## Explosives Engineering, Science & Technology

In September, 2022 we hosted a very successful comprehensive short course on Explosive Engineering, Science & Technology with over a dozen participants from national laboratories, government agencies, and industry. We would like to give a big thank you to the other course instructors Dr. Ruth Doherty from Energetics Technology Center, Dr. Kyle Sullivan from Lawrence Livermore National Laboratory (LLNL), and Dr. Tariq Aslam. We also want to thank our guest speakers from industry Dr. Kyle Gilroy from Vision Research as well as Robin Nicolai and Wai Chan both from Specialised Imaging.



### Explosives Engineering, Science & Technology Comprehensive Short Course



We are excited to announce that we will be hosting this course again on **May 16-19, 2023 in Golden, Colorado**. We have seen large support of this type of education in energetic materials. This course is ideal for students, engineers and scientists interested in advancing their knowledge and careers. Topics will include energetic material/explosive applications, chemistry, manufacturing, numerical modeling, detonation & shock wave physics, laboratory/field testing & instrumentation, and safety. This unique short course opportunity will include expert guest speakers and will allow participants to advance their careers and expand their networks. Please note this course is limited to US citizens only and follows ITAR rules. To learn more or to register for this course, please visit us at <https://petrexplosivesgroup.com/explosive-science-engineering-short-course/>.



## 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](http://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}  
**Colorado** | 16-hours {\$675}  
**Hawaii** | 8-hours {\$325}  
**Indiana** | 8-hours {\$325}  
**Kentucky** | 8-hours {\$325}  
**Missouri** | 8-hours {\$325}  
**Nebraska** | 16-hours {\$675}  
**New York City** | 8-hours {\$325}  
**Pennsylvania** | 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. We are also excited to announce that PETS will soon be available in **Spanish!** Please send us an email to get notified when your state becomes available.

### Online Course Reviews

Reviews are coming in for our online version of our popular Practical Explosives Training School (PETS) class. We have had many blasters from Pennsylvania, Missouri, Alaska and Nebraska join our classes recently. 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.

#### **Would you retake this class?**

Yes I would.

#### **Would you recommend this course to others?**

Yes I would.



## 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 PETS certificate courses for blasting licenses/certificates of fitness 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 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.

This unique 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. 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.

### **Courses Available Online**

#### **Tier I | Blasters & End Users**

- PETS Practical Explosives Training School (Alaska, Colorado, Hawaii, Indiana, Kentucky, Missouri, Nebraska, New York City, Pennsylvania, Washington, Wyoming)

#### **Tier II | Academics**

- Introduction to Explosives, Products & Commercial Applications
- Explosives Science & Technology

#### **Tier III | Special Uses**

- Avalanche Mitigation
- Surface Blasting
- Underground Blasting
- Secondary Blasting
- Introduction to UXO Removal
- Industrial Explosive Cleaning
- Explosive Storage & American Table of Distances (*coming soon*)
- *More coming soon!*

### **Courses Available In-Person**

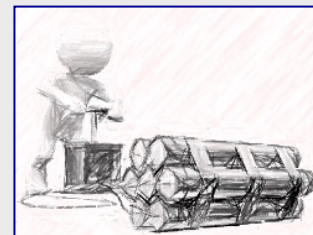
#### **Tier I | Blasters & End Users**

- PETS Practical Explosives Training School Colorado (November 15-16, 2022 and February 15-16, 2023 in Golden, CO)

#### **Tier III | Special Uses**

- Explosives Engineering, Science & Technology (May 16-19, 2023 in Golden, CO)
- High-Speed Imaging for Explosive & Ballistic Applications (*TBD*)

If you have 6 or more employees who require training, we can organize an in-person class specific to your needs! Please contact Dr. Vilem Petr at [vpetr@petrexplivesgroup.com](mailto:vpetr@petrexplivesgroup.com) to inquire.



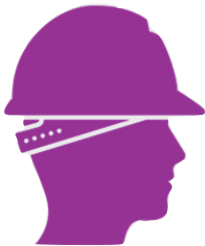


## Upcoming In-Person Courses

### 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, 2022 and February 15-16, 2023 in Golden, CO. Registration is now open at <https://petrexplosivesgroup.com/course-registration/>. We have recently updated this class with new information on solid and liquid rockets for space applications and new quizzes to help prepare you for the state exam. Participant reviews are saying this course is “comprehensive and informative,” “entertaining with lots of information” and that they “really enjoyed the engagement with students and in person interactions.”

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 Colorado State Explosives Program representatives, Scott Narreau, Candace Garza, and David Knight for their continued support and guest lectures. We also want to thank our team member Gary Kirchoff (retired ATF) for sharing his unique insight into ATF laws and regulations with our students. Industry members are regular attendees of our courses, and are 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.



For more information about all our upcoming classes or to register for a course, please visit [PetrExplosivesGroup.com](https://PetrExplosivesGroup.com). We are also happy to develop new specialized trainings specific to your business. To learn more about new course development opportunities or to request an in-person training, please contact Dr. Vilem Petr at [vpetr@petrexplosivesgroup.com](mailto:vpetr@petrexplosivesgroup.com).

**Learn Better with Petr!**

## New Team Member

### Simon Diaz Mendoza



We would like to give a warm welcome to our newest team member, Simon Diaz Mendoza from Chili. Simon is currently pursuing his masters degree in Mining Engineering at the Colorado School of Mines and is currently working hard to translate our PETS class into Spanish. We are very excited to have him as part of the growing Petr Explosives Group Team!



## PETS Toolbox App

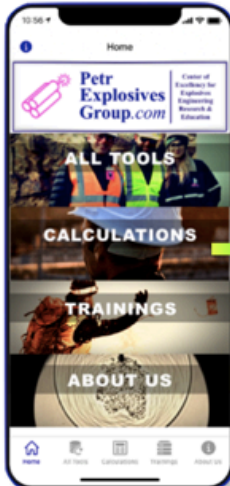
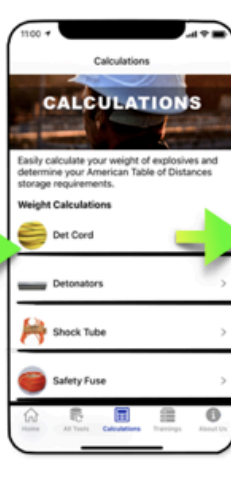

We have developed a FREE mobile application for blasters with an array of tools and calculators to help with magazine inspections, inventory and blast design. Our inventory calculators allow you to easily calculate the net explosive weight in your magazine by converting the number of **detonators, pull-wire igniters, feet of detonating cord, etc.** into **pounds** for ATF and State magazine inspections and use with the **American Table of Distances**.

This app also includes many different calculations for blast design, vibration analysis and overpressure calculations with safety estimates in simple, easy to navigate steps.

Users have reported that **“the tool is really helpful”** and **“I use it religiously for my day to day blasting needs.”**

We are always looking for user input to improve and add to our tool. Please contact Lea Davis at [lea.davis@petrexplosivesgroup.com](mailto:lea.davis@petrexplosivesgroup.com) for your suggestions, requests and comments.

## PETS TOOLBOX

Developed by: Lea Davis

### MOBILE APP for BLASTERS

- Report magazine inventories in pounds
- Reduce errors in calculations & unit conversions
- Predict blast effects



Please visit our website or scan the QR code to download this app onto your mobile device or computer for free.

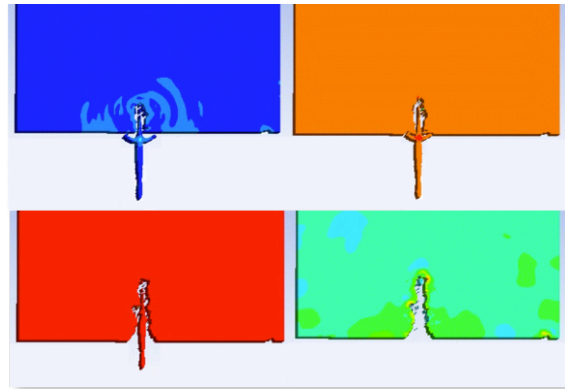
## ATF Newsletter Index

Gary Kirchoff has developed a very useful index of ATF newsletters that address popular regulatory questions and clarifications. You can access this index through the PETS Toolbox App under “All Tools - ATF” or on our website at <https://petrexplosivesgroup.com/atf-newsletter-index/>.



## Numerical Modeling Capabilities

PetrExplosivesGroup.com recently completed a project to develop a numerical model of radial linear shaped charges that are used to cut downhole oilfield pipes. This worked helped to understand and validate the jetting characteristics considering the line density parameters by developing numerical validations with experimental results using different materials and geometries. This work was ultimately used to compare two different model geometries of shaped charges and predict underwater performance.



Oil well perforating shaped charge model.

We utilize AUTODYN hydrocode to solve transient, dynamic wave propagation problems related to impact, penetration, perforation, and explosions. It is ideal for these highly nonlinear and time-dependent events. Both Lagrangian and Eulerian solvers are used to accurately model various events.

If you have any numerical modeling needs for practical problem solving or research, we will be happy to work with you.

## Conferences & Publications

PetrExplosivesGroup.com attended this year's IPS Seminar in Colorado Springs, Colorado, 2022. During this Seminar we published and presented our paper "Experimental Investigation into the Safety Distance for Ethane-Oxygen Gas Explosion Applied to Industrial Cleaning." We also participated in the poster session to outline our unique research and training capabilities. We are looking forward to the next IPS Seminar in 2024. The PetrExplosivesGroup team will also be attending the upcoming International Society of Explosive Engineers (ISEE) conference on February 4-8, 2023 in San Antonio, Texas and we hope to see you there!





## **PEG Education Foundation Scholarship Opportunity!**

Petr Explosives Group's Education Foundation™ is now offering \$20,000 in Explosives Engineering Scholarships for the academic year 2022-23 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](http://PetrExplosivesGroup.com).



## **Editorial Notes to Prospective Students**

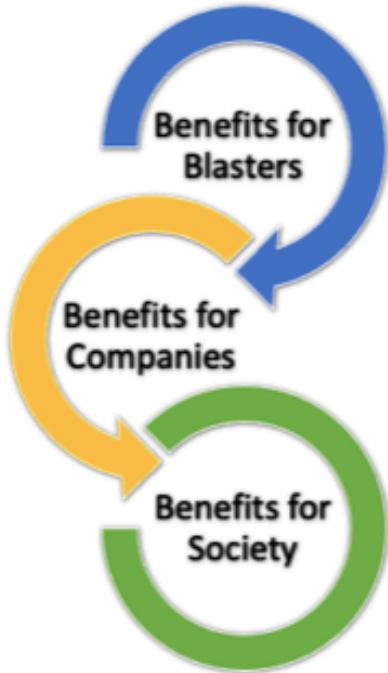
If you are interested in pursuing a career as a commercial blaster or explosives engineer and are unsure how to get started, please do not hesitate to contact us. We are dedicated to supporting this industry and properly educating and mentoring the next generation. Petr Explosives Group has years of experience advising, supporting, and forging useful connections for students and new blasters. Therefore, if you have any questions on how to forge your path, please do not hesitate to contact us. We are always happy to help in any way we can.

If you are needing to advance your practical and/or academic knowledge in blasting techniques, safety, and instrumentation, we can advise you through our established program. With our International Explosives Academy Program, you can earn individual certifications or even a diploma. We understand that modern students have differing learning styles and busy schedules. This is why we offer flexible classes that can be completed online, remotely via video conference, or in-person. We also provide hands-on training with industrial experts in specific commercial applications.

And the best part? We are an independent company which allows us to offer these courses without the large administrative overhead of traditional universities and pass these saving directly to you!



## Benefits of the Petr International Explosive Academy™



- Advance your knowledge and job opportunities
- Obtain continuing education and earn training certification and a diploma in Explosives Technology
- Obtain a broad range of knowledge including technical and communication skills
- Support, preparation, and guidance for career advancement
- Hands-on, practical training opportunities
- Become part of our network of fellow blasters and engineers

- Improved worker safety
- Highly-skilled professionals
- Address long term prospects not just entry level jobs
- Achieve work-based knowledge and skills
- Professional Development must be able to incorporate an array of possible teaching strategies in classroom, laboratory and work-base settings

- Recognized by industry professional organizations and state governments
- Get involved with education issues and help to advance the current regulations and safety rules
- Provide input and recommendations to improve Safety Operation Procedures
- Framework can guide funding priorities, program development, classroom instruction and relationship with external constituencies

At Petr Explosives Group, we believe that education is one of the most crucial components that allow people to better themselves. A person misses out on many important opportunities if they are deprived of a complete education. Some of the exciting benefits of education is access to a rewarding and fulfilling career and the possibility of earning a higher income. Continuing education and professional development is also vital to maintaining credibility in your field, improving your marketability in the workforce, and enabling you to make a greater impact in your field. Take the first steps on the path to your future today. Please visit our website or call us for more information.

**Thank You,**

**Petr Explosives Group**