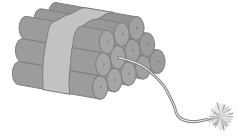


The Primer



Newsletter of the Golden West Chapter, International Society of Explosives Engineers
23633 Brewster Drive, Columbia, CA 95310

Volume 19

Spring / Summer 2008

Issue 1

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The Primer is published four times per year on the website of the Golden West Chapter of the ISEE:

www.iseegoldenwest.org

Articles may be submitted to:

Golden West Chapter - ISEE
23633 Brewster Drive
Columbia, CA 95310

President's Message...

We are getting into that time of year when the thermometer rises, everyone gets busy and before you know it, it is raining again. Not to rush things, but where has 2008 gone? It seems like just yesterday we were talking about a busy upcoming year for the Chapter, another salmon fishing trip, workshops, a summer social activity and a fall event. As they say, "the best laid plans of mine and men" The salmon fishing season has been cancelled; our spring has passed us by with Conexpo/Conagg taking up a significant part of the schedule. I am pleased that so many of our members stopped by the show to say hello and spend a few minutes catching up.

The housing market is depressed but our business is more than just housing projects. From my discussions with many of you the aggregate business is down from what it was just a few years ago and many drillers have rigs parked which last year were building house pads and putting in underground utilities. One of our members put it very well when he said that we are back into a more normal cycle, what we used to see maybe 10 years ago. At that time our quarries took a winter shut-down to do the maintenance on the plant, catch up on the utility work that was put off and generally take a breather. We have gotten used to working continuously and doing maintenance only when something breaks or safety becomes an issue.

Safety is something that we should keep on the top of our "to do list". Too often when we get busy, safety suffers. The welfare of our fellow workers and associates is too important not to stop and point out a safety issue or an unsafe practice. I hope that with the slow down in the business everyone can take the time to reinforce the safe practices we know are required for any operation and company.

(continued on page 2)

The Primer

President's Message (cont.) ...

Technology is advancing all around us. If we stand still we are actually going backwards. My recommendation is to use this time to work with the suppliers, safety specialists, land use planners and anyone who has an effect on your business to make that affect a positive one. Get out and visit with your neighbors and others in this industry. Ask questions and understand the many forces that are against your staying in business. If you look around not only this country but the world you will see how "they" are organized, they use our disassociation against us, our fear of talking together. Our competitive nature is actually used as a tool to break us down. They legislate against our use of explosives, restrict its transportation or try to increase the cost of manufacturing it, documenting its life cycle or the licensing of people to use it to the point that it becomes not economical any more. They say they don't want to shut us down, they just make it where we do that on our own because we can't make money. Profit is not such a bad thing!

For the sake of our industry I hope that you are all very busy and making lots of money this summer. While you are doing that do a couple of things for me:

- Be safe and keep those around you safe.
- Look around you, see where you have been and where you are going.
- Get involved in your world.
- Ask questions, don't believe them when they say we are the problem. We are the solution to so many of the world's problems. Just make them realize it.
- Always remember, "if it can't be grown, it has to be mined."

As you read this issue of the Primer take note of the advertisers who are spending their money to include an ad or business card. These are the people who support you and us. Do business with them! These are the companies and people who are here for the Golden West Chapter, why support those who do not support you?

There is a Want Ad for a new editor. The Primer has been an award winning voice of the Golden West Chapter since its inception. We need someone who has a few minutes every month and has the passion of producing a first class publication. If you are such a person or know of someone please respond. Our present editor, Wes Bender is finally going to retire, again. He has earned his rest and needs to spend time on the fishing stream flogging flies so we are in need.

If you have any suggestions for making the GWC a better professional organization, activities that can be organized, important issues to our industry that need a voice or just an excuse to get together over an adult beverage let us know. The Board of Directors is always looking for new people and ideas.

Have a great 2008 and we will see you again this fall.

Bill Warfield June, 2008

Editor's Notes

Okay, so I retired from the editor's job after the last issue of the 2007 Primer..... Although I'm still retired, Bill convinced me to paste another one together because, frankly, although no replacement editor has been found, neither of us want to see it go away. After all, the Primer is our main means of communication within the Chapter. Actually, putting an issue together can be a rather enjoyable experience. Computers and decent software make the task much easier than when we used to have to type it all out and then send it to a printer, hoping that it would fit the pages correctly. Composing and massaging the text that makes up each issue is a piece of cake. Photos (if you would only send us some) could be easily added, along with charts and graphs embedded in articles. An added benefit is that, by editing and publishing the Primer in-house and posting it on our website, we realize a considerable savings over having it composed and mailed by professionals. (Carey Haughy, our Secretary, still mails hard copies to a few of our computer-challenged members though.)

Bill makes mention in his President's notes, that summer and warm weather is upon us. You might not notice it up here in Alpine at 8000 feet . It snowed 7 inches here four weeks ago. We had a slightly wetter winter this year in the White Mountains and everything has greened up nicely this spring. The monsoon pattern of weather is slowly making its way northward from the Gulf of Mexico, so we can expect afternoon thunderstorms to start sometime in the next week or so. Clear, cool mornings, followed by gathering storm clouds, good rain accompanied by thunder and lightning, all clearing off by about 4:00 in the afternoon so that we can enjoy cocktail hour out on the deck. 'Way better than being southern Arizona this time of year.....

For the first time in many years, we have not been able to get a Chapter workshop scheduled for the membership. To make up for that deficiency, commencing with this issue of *The Primer* we're going to include supplements that together will comprise an educational workshop for the membership. You won't have to sign up. It won't cost you anything but a few moments of your time. You won't have to go anywhere. You can even open up a beer, prop your feet up and soak up some knowledge while you relax. We've tried to organize the material in some logical manner and this first supplement deals with the basics leading to blast design and is tailored primarily for some of our newer members. To access it, go to the chapter website and click on "Primer Supplement". Please check it out and then take the time to give us some feedback. The next supplement will get into blast design itself. Don't hesitate to let us know if there are any subjects that would like to see included in the future. We're doing it for you, so speak up.

Cheers,
Wes Bender

→ Help Wanted ←

The Golden West Chapter has an urgent need for an editor for the chapter newsletter, *The Primer*. No experience necessary. The job entails only a few hours per issue, four times per year. The only requirement is that you have access to a computer. The job will NOT be simply dumped in your lap. Free training will be provided. Have you been wanting to contribute to the success of the chapter, but don't know how? This could be your chance. Call Bill Warfield or send him an e-mail and volunteer today.

For further details on what the job entails, or if you have any questions, contact:

Wes Bender at wbender@earthlink.net or
P.O. Box 887, Alpine, AZ 85920
(928) 339-1973

Online Workshop is Offered

Starting with this issue of The Primer, we're offering you a workshop in printed form. The subject, **Basic Blast Design**, was originally developed for presentation at the spring 1999 workshop of The Golden West Chapter but has been expanded and revised.

The sections included in the supplement for this issue include: Introduction, Definitions and Terminology, and the Physics of Energy Release and Rock Breakage.

Future supplements will include: Considerations for Blast Design, Blast Design Basics, Initiation Timing, Effects of Geology, Cautious Blasting Techniques and Design, Impedance Matching, and other similar topics.

To access the supplement to The Primer that contains the workshop, go to the chapter website and click on the "Primer Supplement" button. For those members of the chapter who lack Internet access, the supplement is being mailed with their issue of The Primer.

We hope you enjoy this on-line workshop and look forward to your feedback.



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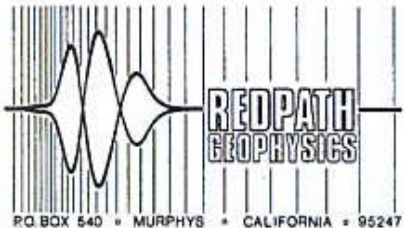


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Wes Bender , Board Member	(520) 648-3581		

The Primer

Shakin' It Up

with Wes Bender

Yeah, I know. This particular article ran in The Primer a few years ago, but we've got some newer members who weren't around then and it makes for fairly entertaining reading, so.....

How many times have you encountered unique ways of using explosives? Some of them relate quite easily to conventional blasting tasks but others seem to be a bit more creative. Maybe you have encountered instances where someone has a strange request for your blasting skills. Here are a few.

In the '70s, we used to sell binary explosives at Alpha Hardware in Nevada City. They were easy (and quite legal) to store under lock and key in the warehouse. Our main customers were the occasional weekend miners, small utility contractors and some of the local loggers. One of the local logging companies was going through an inordinant amount of 1 and 5 lb binary pouches. I knew the area where they were logging. They weren't building roads and there wasn't much rock in that location even if they were. On questioning their foreman, I found out that they were hanging the pouches from tree limbs and detonating them to kill the large numbers of meat bees and wasps that were harrassing them. He claimed that it would knock the bees wings off at a hundred feet. I didn't check that out, but on hindsight, I missed a good chance to conduct some serious investigation and write a paper for the ISEE on the radius of bee kill per pound of explosive.

Another missed chance for a good technical paper occurred when a Lake Tahoe contractor called me and needed to know the radius of abalone kill per pound of explosive underwater. (He had heard that I had blasted a couple of submerged boulders at Donner Lake and had noted the lack of injury to the crawdads on the rocks we blasted.) He had a contract to put in a sewer outfall in the ocean that required blasting. The California Department of Fish and Game required that he send divers down and move all the abalone to a safe distance, conduct the blasting, and then send the divers down to move the abalone back. He felt that this was going to be pretty costly. Abalone injured or killed would cost him \$7 each in fines. I told him I had no idea how far he had to move them, but I did have a suggested scheme: (1) Don't move any abalone, (2) do the blasting, (3) pay the state for any dead and injured abalone, (4) take them home and eat them, (4) write a book on the radius of abalone kill per pound of explosive and (5) sell the book to recapture the costs. He didn't see the logic (or the humor) in my suggestion and I never did get a chance to report the scientific particulars to the ISEE. Probably just as well. We didn't have very sophisticated hydrophones available then and I wouldn't have had good water pressure data to include in the report.

Of course, if Fish and Game wants to kill fish with explosives, it's an entirely different matter. Most of you are aware of the situation with the Northern Pike at Davis Lake, near Portola. Quite a few years ago I was informally asked by DFG (no contract, no money, no credit, no blame) about the possibility of erradicating the Northern Pike with explosives. Using Cole's formula for pressures from underwater detonations, pressure rise times and what limited information I could obtain at that time on mortality rates of fish, I determined that the best way to do it was to lower the lake level (to diminish the volume of water involved), lay out a detonating cord grid, put 1 pound boosters on down lines and shoot the whole lot at once. Because you can't erradicate the fish if ANY survive, I naturally designed a little on the strong side. (cord manufacturers would have loved me...) Of course, I didn't give the DFG the particulars on spacings, etc. (no contract, remember?), but I did give them ballpark figures on cost. They eventually figured it would be better to poison the Pike and this was attempted after a lot of environmental/political/legal wrangling.

(continued)

This first poisoning was tried in 1997. Unfortunately, they either didn't get them all or someone replanted Pike because they started showing up again 1999. F&G then decided that they should use explosives after all. They would use cord, but without the boosters. A test shot killed a good number of the Pike and they decided that they could keep their numbers in check if they blasted them once in a while with detonating cord. For the record, on the test shot F&G strung two 400 foot long 50 grain detonating cord lines spaced about 40 feet apart. They had caged Pike at 23 feet, 28.75 feet and 34.5 feet from the nearest cord. All the Pike at 23 feet were killed. One of two at 28.75 feet was killed and none were killed at 34.5 feet. Bear in mind these were Northern Pike and the size of a fish and whether it has a swim bladder plays a major part in the expected mortality rate. Recently (2007) an extensive program to poison the Pike in Davis Lake and its tributaries was undertaken, so they may not be blasting them today. Note that I'm not advocating any of you fisherman out there use this information in your piscatorial endeavors, mainly because I'd rather not see an excise tax put on explosive devices just because they are considered fishing tackle.

While on the subject of detonating cord, many of you are aware that trees can be cut down with it. It doesn't make a very clean cut, though. Lots of toothpicks. Although you and I might not be able to obtain the stuff, forest fire fighters have had a weapon at their disposal called Fireline Explosives. It is a large diameter (think fire hose size) detonating cord. When I was familiar with it in the late '70s, they used flame-quenching salts around the main powder core, similar to seismic cord. The object was to clear a firebreak, not to start another fire. One of the drawbacks to using FLE is that you must be absolutely certain that no one is in the vicinity when you shoot it and that can present problems in a forest fire fighting situation. I don't know if it is still being used, but if it is, it would only be by well-trained crews and only in very isolated locations.

Quite a few years ago, after reading an article on shearing off bridge piers written by my friend, the late Don Mathews, I became interested in using detonating cord as a main explosives charge. It has some advantages. It is easy to control exact quantities. If you load the shot too lightly, you can usually re-load (after the holes cool) and shoot it again. The diameter allows it to be fed into small orifices if necessary. Of course the big drawback is the noise. I was able to use cord as the main charge on several blasting projects.

I was once involved with Danny Lewis of Grass Valley in a contract to chamfer the outer top edge of the concrete breakwater at Diablo Canyon nuclear power plant. This was while the power plant was still under construction. The owner wanted to remove a slice of concrete measuring 2.3 feet horizontally and 4 feet vertically from the entire ocean side of the breakwater. This was being done to prevent rogue waves from physically moving the whole breakwater. (It was felt that it would be better to have some water surge over the top rather than having the full force of the wave move the entire block.) I had previously designed concrete-removal blasts at Box Canyon Dam and Danny asked for my assistance on this project.

I did some rough calculations using various loadings of 50 and 200 grain per foot detonating cord as the main explosive charge to nearly instantly pressurize a parallel line of holes to remove the concrete. We gave the owner the option of shearing large chunks of the concrete off cleanly, letting them slide into the water where they could be retrieved later or, optionally, making the concrete just go away. The owner's engineers felt the latter would prove cheaper, but was concerned we might damage the remaining concrete.

They also asked where the blasted concrete went when we made it "go away". (We refrained from using the term "vaporize" because, while it sounded plausible, it wasn't technically correct and the term tends to worry some people.) We assured them that the massive concrete that remained would not be damaged and that the blasted concrete would be reduced to small pieces that would be propelled out into the ocean (hopefully, short of shipping channels). My initial calculations estimated that 8 strands of 50 grain cord placed in holes drilled on 16 inch centers would accomplish the job satisfactorily. (We could have used less if we had just wanted to shear and drop it.)

(continued)

The Primer

A previous contractor had intended to blast the concrete with conventional explosives in holes on 24 inch centers. I don't know what his designs were nor why he wasn't allowed to proceed, but we inherited a fairly long stretch that he had already line-drilled on 24 inch centers (not very accurately, I might add). I didn't wish to increase the charge to account for the increased spacing, so we drilled interim holes, bringing the spacing down to 12-13 inches. If the owner had wanted the concrete sheared and left, the 24 inch spacing would have been fine, but I did not want to risk damaging the remaining concrete with the heavier charge weights that would have been required to heave the concrete using that spacing. We were also striving for a smooth clean cut.

We did not plug the top or bottom of the holes, leaving them open. With the cord detonating at approximately 23,000 feet per second, the pressure rise is sufficiently fast that it causes the concrete to shear between holes before an appreciable amount of the gas can exit the open ends. Of course the noise was fierce, but we were fairly isolated from any residential areas.

With the successful completion of a 13 hole test blast, we decided no changes needed to be made to the design and Danny carried out the remainder of the chamfering without any problems. Usually 75 to 100 holes were shot at a time. While most blasts were shot at night so as not to conflict with other work in progress on the breakwater, several were shot during daylight hours. The results were rather spectacular. I suppose you could have called it flyrock (maybe flycrete?), but this was not flyrock. It was behaving exactly as intended. Danny gave me several photos he took during daylight blasts and the sight of concrete chunks launching toward Hawaii was quite spectacular. There was some talk of reducing the charge weights, but they were happy with the results and didn't make any changes as far as I know. Come to think of it, we forgot to bill Fish & Game for providing additional fishing reef material out in the Pacific.....

What have you done with explosives lately that might seem out of the ordinary? Harvested any potatoes with it? A Hercules distributor in Iowa once tried it. (Scared the daylights out of his wife, too, but that's another story.) Clear ice off of radar domes in remote mountainous country? I know a lady in Salt Lake City that can do that. Loosen up any stuck machinery? How about freeing up a large stuck hydraulic piston inside a cylinder with detonating cord? It was done on a cylinder that had been exposed to salt air. Only required a small hole to be drilled into the cylinder, and then welded up after the job was done. Pretty cool. Explosives have been used to clear ice and snow off of roadways on numerous occasions. They did it during the construction of I-80 over Donner Summit. Explosives have also been used to clear ice and snow off of the road from Bishop up to the Cardinal Mine, but that was in the '30s. I believe the same process was used at Pine Creek when that tungsten mine was still operating. There have been numerous instances where explosives have been used to blast buildings to stop major fires from destroying whole towns. Of course, everyone is probably familiar with Red Adair (and others) who have successfully extinguished oil well fires with explosives. For quite a few years (until liability issues were raised) the blasts that signalled the beginning of activities on the morning of the Fourth of July in Nevada City were sticks of dynamite strung on cable on top of Sugarloaf.

One of our previous chapter member once blew a bank vault. Can anyone tell me who? Send me your best guess. I'll print the names of the persons who can name the individual in the next issue of The Primer. Hint: He was a charter member of the chapter.

There's got to be a ton of other instances where explosives were used in unconventional situations. If you know of any, let's hear about them. We'll even protect your identity, if you have any concerns about getting in trouble over it. Before any readers go out and start experimenting, though, bear in mind that most of the above situations occurred before explosives laws and security measures were as tight as they are today. While maybe not necessarily illegal, some of the uses would surely be frowned upon if tried today.

BE SAFE!

How Come???..... women use words somewhat differently than men? In researching some material online, I came across the following and thought it might prove helpful for you blasters to better understand your wife or girlfriend (or both):

(1) **Fine:** This is the word women use to end an argument when they are right and you need to shut up.

(2) **Five Minutes:** If she is getting dressed, this means a half an hour. Five minutes is only five minutes if you have just been given five more minutes to watch the game before helping around the house.

(3) **Nothing:** This is the calm before the storm. This means *something*, and you should be on your toes. Arguments that begin with **nothing** usually end in **fine**.

(4) **Go Ahead:** This is a dare, not permission. Don't Do It!

(5) **(Loud Sigh):** This is not actually a word, but is a non-verbal statement often misunderstood by men. A **loud sigh** means she thinks you are an idiot and wonders why she is wasting her time standing here arguing with you about **nothing**.

(Refer back to # 3 for the meaning of **nothing**.)

(6) **That's Okay:** This is one of the most dangerous statements a woman can make to a man. **That's okay** means she wants to think long and hard before deciding how and when you will pay for your mistake.

(7) **Thanks:** A woman is thanking you. Do not question, or faint. Just say you're welcome. However, this is not true if she says **Thanks a lot**. That is PURE sarcasm and she is not thanking you at all. DO NOT say 'you're welcome' ... that will bring on a **whatever**.

(8) **Whatever:** Is a women's way of saying SCREW YOU!

(9) **Don't worry about it, I got it:** Another dangerous statement, meaning this is something that a woman has told a man to do several times, but is now doing herself. This will later result in a man asking 'What's wrong?' For the woman's response refer back to # 3, **nothing**.....